Resurging Asian Giants: Lessons from the People’s Republic of China and India

The economies of the People’s Republic of China and India have seen dramatic growth in recent years. As their respective successes continue to reshape the world’s economic landscape, noted Chinese and Indian scholars have studied the two countries’ development paths, in particular their rich and diverse experiences in such areas as education, information technology, local entrepreneurship, capital markets, macroeconomic management, foreign direct investment, and state-owned enterprise reforms. Drawing on these studies, the Asian Development Bank has produced a timely collection of lessons learned that serves as a valuable refresher on the challenges and opportunities ahead for developing economies, especially those in Asia and the Pacific.

About the Asian Development Bank

ADB’s vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region’s many successes, it remains home to two-thirds of the world’s poor: 1.8 billion people who live on less than $2 a day, with 903 million struggling on less than $1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.
## Contents

Abbreviations xi

Foreword xiii

Acknowledgments xv

1 Lessons from the People's Republic of China and India 1  
Yoshihiro Iwasaki

Manmohan Agarwal

3 Developing Physical Infrastructure: A Comparative Perspective on the Experience of the People’s Republic of China and India 57  
Rajiv Lall, Ritu Anand, and Anupam Rastogi

4 The People’s Republic of China’s Manufacturing Sector since 1978: Implications for India 117  
Rajeev Anantaram and Mohammed Saqib

5 State-Owned Enterprise Reforms in the People’s Republic of China 167  
Poonam Gupta and Amitendu Palit

6 Segmentation and Unification in the People’s Republic of China’s Labor Market: Lessons for India 201  
Bibek Debroy

7 An Overview of India’s Growth and Development 227  
Dashu Wang

8 The Experience of India’s Software and Information Technology-Enabled Service Industries 261  
Jiang Qiping

9 Higher and Professional Education in India 307  
Shi Xiaoguang and Yan Fengqiao

10 India’s Financial Sector Reform and Experience: Lessons for the People’s Republic of China 345  
Peter G. Zhang and Jian Yang

11 Outstanding Entrepreneurs in India 385  
Zhang Minqiu
List of Tables

Lessons from the People’s Republic of China and India

Table 1: Key Indicators for Selected Asian Developing Countries, 2006 3
Table 2: Sector Shares in Gross Domestic Product 12

Developing Physical Infrastructure: A Comparative Perspective on the Experience of the People’s Republic of China and India

Table 1: Development of Infrastructure Capacity, People’s Republic of China and India 58
Table 2: Macroeconomic Indicators, People’s Republic of China 60
Table 3: Infrastructure Investment in 1998, 2005, and 2006 61
Table 4: Consolidated Fiscal Balance, People’s Republic of China and India 62
Table 5: Structure of Investment of National Economy 63
Table 6: Sources of Funds for Fixed Investment in Infrastructure, 2006 65
Table 7: Return on Equity for the People’s Republic of China’s Publicly Traded Coal and Power Companies 78
Table 8: Development of Road Infrastructure in the People’s Republic of China 80
Table 9: Effective Electricity Tariff, 2004 86
Table 10: Returns to Power Generation, Transmission, and Distribution 86
Table 11: India: Power Capacity Addition during the Five-Year Plans, Actual versus Target 92
Table 12: Rural Electricity Development, 1987–2002 93
Table 13: Main Purpose of Rural Electricity Usage 94
Table 14: Household Access to Electricity in India 95
Table 15: Power Consumption in India by Category, 2003–2004 96
Table 16: Progress of the Road Network in India 98
Table 17: Installed Power Capacity and Output Generated by Fuel Source, People’s Republic of China 99
Table 18: Installed Power Capacity and Output Generated by Fuel Source, India 100
Table A.1: Macroeconomic Indicators, India 111
Table A.2: Listed Power Companies in the People’s Republic of China, End 2003 112
Table A.3: Road Mileage by Technical Condition 113
Table A.4: Road Mileage by Pavement Classification 113
Table A.5: Road Mileage by Administrative Level 114
Table A.6: Electricity Prices in Selected People’s Republic of China Provinces, 2004 114
Table A.7: Electricity Prices in Selected States of India, 2004 115
The People's Republic of China's Manufacturing Sector since 1978: Implications for India

Table 1: Profile of Manufacturing Exports, People's Republic of China
Table 2: Comparison of the Manufacturing Sector in the People's Republic of China and India, 1980–2005
Table 3: Regional Distribution of Industry in the People's Republic of China, 2004
Table 4: Changes in Total Factor Productivity in Industry in the People's Republic of China, 1952–2005
Table 5: Distribution of the People's Republic of China's Manufacturing Sector by Size
Table 6: Educational Attainment of the Population
Table 7: Impact of Foreign Direct Investment in the People’s Republic of China
Table 8: Gross Industrial Output Value of Foreign-Funded Enterprises by Industry, 2000 and 2005
Table 9: Modes of Foreign Direct Investment in the People’s Republic of China
Table 10: Foreign Direct Investment Stock in the People's Republic of China, by Province, 2005
Table 11: Foreign Direct Investment Inflows to the People's Republic of China, by Country or Area of Origin
Table A.1: Economic Indicators, People's Republic of China
Table A.3: Gross Output Value of Industry in the People's Republic of China, by Ownership
Table A.4: Share of Manufactured Goods in Total Expenses
Table A.5: Employment in the People's Republic of China's Manufacturing Sector
Table A.6: Foreign-Funded Enterprise Contribution to Industrial Output, People's Republic of China
Table A.7: Regional Distribution of Foreign Direct Investment, People's Republic of China
Table A.8: Checklist of Landmark Legislation of Foreign Direct Investment Policy in the People's Republic of China

State-Owned Enterprise Reforms in the People's Republic of China

Table 1: Evolution of State-Owned Enterprises
Segmentation and Unification in the People’s Republic of China’s Labor Market: Lessons for India

Table 1: Population, Labor Force, and Employment Indicators in the People’s Republic of China 215
Table 2: Urban Employment by Province 217

An Overview of India’s Growth and Development

Table 1: Growth of Gross Domestic Product 228
Table 2: India’s Population Below Poverty Line 228
Table 3: Performance of India’s Information Technology Sector 231
Table 4: Computer and Information Technology Exports 232
Table 5: Structure of India’s Services Exports 232
Table 6: India’s Information Technology Sector 234
Table 7: Exports of Services, 2004 236
Table 8: Sector Share in Real Gross Domestic Product 237
Table 9: Annual Average Growth Rate at Constant Prices 239
Table 10: Contribution to Economic Growth by Disposition of Expenditure 242
Table 11: Savings and Investment 245
Table 12: India’s Open Economy 246
Table 13: Foreign Direct and Foreign Portfolio Investment to Select Countries 249

The Experience of India’s Software and Information Technology-Enabled Service Industries

Table 1: Revenues of India’s Information Technology Industry, Fiscal Years 2005–2009 263
Table 2: Export Structure of India’s Software Industry, Fiscal Years 2005–2008 264
Table 3: Output of Software Industry of the People’s Republic of China and India in the Late 1990s 264
Table 5: Wage Gaps between India and the United States, 2002–2003 272
Table 6: Comparison of Educational Endowments in Karnataka and West Bengal 276
Table 7: Distribution of Headquarters of the Top 500 Software Firms in India, 2002 276
Table 8: Registered Software Companies in Recent Years in Bangalore, by Gross Exports 277
Table 9: Progress of Kolkata Software Technology Park 278
Table 10: Comparison of Labor Costs in India and the United States 284
Table 11: Number of Indian Students in the United States after India’s Liberalization Reform 286
Table A.1: Production Value of India’s Electronics and Information Technology Industry, Fiscal Years 2004–2009 306
Table A.2: Exports of India’s Electronics and Information Technology Industry, Fiscal Years 2004–2009 306
Higher and Professional Education in India

Table 1: Academic Structure of India's Higher and Professional Education

Table 2: Growth of Institutions, Enrollment, and Teaching Faculty at Higher Education Institutions in India, 1948–2006

Table 3: Types of Higher Educational Institutes in India, Academic Year 2005–2006

Table 4: Areas of Concentration of Universities with Potential for Excellence

Table 5: Indian Institutes of Technical Education

Table 6: Number of Engineering and Technology Institutions, 1947–1989

Table 7: Technical and Vocational Programs

Table 8: Regulatory and Statutory Bodies for Higher Education in India


Table 10: Higher Education Landmarks in the History of Modern India

Table 11: Public Expenditure on Higher Education in India, Fiscal Year 2004

Table 12: Budget Expenditure on Higher Education, Fiscal Years 1990–2004

Table 13: Growth and Share of Career-Oriented Courses and Programs

Table 14: Contrast in the Level of Social Development between India and the People's Republic of China

Table 15: Distribution of Educational Expenditure in India and the People's Republic of China

Table 16: Education Data for the Three Countries with the World's Largest Higher Education Enrollments, 2004

Table 17: Selected Indicators for Higher Education in India and the People's Republic of China

Table 18: Enrollment, Outturn, and Stock of Higher Education Graduates, 2005

Table 19: Profiles of the Seven Indian Institutes of Technology

---

India's Financial Sector Reform and Experience: Lessons for the People's Republic of China

Table 1: Major Events of India's Financial Reform

Table 2: Structure of India's Banking Industry

Table 3: Banking Indicators in Fiscal Year 2004

Table A.1: Percent of All Scheduled Commercial Banks in Fiscal Year 2004

Table A.2: Foreign Banks Entry in India

Table A.3: Reserve Bank of India Guidelines for Risk Management in India's Banking Industry

Table A.4: Growth and Inflation in India, A Historical Record

Table A.5: Market Capitalization of India's Stock Market

Table A.6: Annual Turnover and Its Ratio over Gross Domestic Product

List of Figures

Lessons from the People’s Republic of China and India

Figure 1: Demographic Dividend 6
Figure 2: Growth and Stability 15
Figure 3: External Balance 17
Figure 4: Nominal Exchange Rates 18
Figure 5: Real Exchange Rate 19

Developing Physical Infrastructure: A Comparative Perspective on the Experience of the People’s Republic of China and India

Figure 1: Sources of Financing for Overall Fixed Investment 65
Figure 2: Infrastructure Financing Chain in the People’s Republic of China 67
Figure 3: Power Sector Market Structure in the People’s Republic of China 75
Figure 4: People’s Republic of China’s Power Sector Financing Chain, 2006 76
Figure 5: Electricity Prices for Households, 2005 77
Figure 6: Coal and Electricity Price Growth 77
Figure 7: Electricity Value Chain 79
Figure 8: Highway Sector Financing Chain in the People’s Republic of China 84
Figure 9: Infrastructure Financing Chain in India, 2006–2007 85
Figure 10: People’s Republic of China—Regulatory and Institutional Arrangements in the Infrastructure Sector 89
Figure 11: India—Regulatory and Institutional Arrangements in the Infrastructure Sector 89
Figure 12: Pace of Rural Electrification in India, 1947–2004 95
Figure 13: Construction of Rural Roads in India, 1950–2005 97
Figure 14: Carbon Dioxide Emissions from Thermal Power Plants and Power Generation 100

The People’s Republic of China’s Manufacturing Sector Since 1978: Implications for India

Figure 1: Investment as Share of Gross Domestic Product, 1952–2004 118
Figure 2: Structural Composition of the People’s Republic of China’s Economy, 1978–2005 121
Figure 3: Manufacturing Exports and Total Exports, 1980–2005 125
Figure 4: Ownership Patterns in People’s Republic of China Industry, 1978–2004 128

State-Owned Enterprise Reforms in the People’s Republic of China

Figure 1: Share by Ownership in Industrial Sector Value-Added 176
Figure 2: Share of Various Types of Enterprises in Industrial Output 177
Figure 3: Share in Industrial Employment, by Ownership
Figure 4: Share of Different Industrial Activities in 2003, by Output and Ownership
Figure 5: Forms of Gaizhi in 2002
Figure 6: Employment in State-Owned Enterprises in the People’s Republic of China
Figure 7: Total and Sectoral Employment in the People’s Republic of China
Figure 8: Output per Worker, by Ownership
Figure 9: Share of Output and the Export Intensity of Foreign Enterprises in 2003
Figure 10: Profits of the Industrial Sector and State-Owned Enterprises

Segmentation and Unification in the People’s Republic of China’s Labor Market: Lessons for India

Figure 1: Loss of Gross Domestic Product as a Result of Rural and Urban Labor Market Segmentation, 1957–2000
Figure 2: Clusters of Growth in the People’s Republic of China
Figure 3: Evolution of Labor Rights in the People’s Republic of China
Figure 4: Correlation between Informal Sector Share and Per Capita Income

An Overview of India’s Growth and Development

Figure 1: India’s Exports of Goods and Services
Figure 2: Trends in Services Sector Share of Gross Domestic Product

The Experience of India’s Software and Information Technology-Enabled Service Industries

Figure 1: India’s Information Technology–Software Industry
Figure 2: Employment in the Software Industry of the Four Leading Countries, 2005

Higher and Professional Education in India

Figure 1: Number of Institutions Accredited by the National Accreditation and Assessment Council, Fiscal Years 1999–2007
Figure 2: Number of Higher Education Institutions, Academic Years 2000–2001 and 2005–2006
Figure 3: Growth in Enrollment in Private and Public Education Institutions, Academic Years 2000–2001 and 2005–2006
Figure 4: Economic Model to Analyze Higher Education Demand and Supply
India's Financial Sector Reform and Experience:
Lessons for the People’s Republic of China

<table>
<thead>
<tr>
<th>Figure A.1:</th>
<th>Share in Assets of Scheduled Commercial Banks in India, 2006</th>
<th>376</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure A.2:</td>
<td>Nonperforming Assets in India and the People's Republic of China, 2005</td>
<td>377</td>
</tr>
<tr>
<td>Figure A.3:</td>
<td>Financial Depth: Financial Stock as Percentage of Gross Domestic Product, 2004</td>
<td>378</td>
</tr>
<tr>
<td>Figure A.4:</td>
<td>Bank Deposits as Percentage of Financial Stocks</td>
<td>379</td>
</tr>
<tr>
<td>Figure A.5:</td>
<td>Stock Exchange Indices, Shanghai versus Mumbai</td>
<td>379</td>
</tr>
<tr>
<td>Figure A.6:</td>
<td>Share of Private and Public Sectors in the Total Capital Realized</td>
<td>381</td>
</tr>
<tr>
<td>Figure A.7:</td>
<td>Origin of Foreign Institutional Investors Registered with the Securities and Exchange Board of India</td>
<td>382</td>
</tr>
<tr>
<td>Figure A.8:</td>
<td>Indian Rupee–Dollar Exchange Rate between 2 January 1991 and March 2008</td>
<td>382</td>
</tr>
<tr>
<td>Figure A.9:</td>
<td>Derivatives Trading in India</td>
<td>383</td>
</tr>
</tbody>
</table>
Abbreviations

ACFTU – All-China Federation of Trade Unions
AICTE – All-India Council for Technical Education
ADB – Asian Development Bank
BOP – balance of payments
CABE – Central Advisory Board of Education
CDB – China Development Bank
CMM – Capability Maturity Model for Software
CSO – Central Statistical Organisation
DEC – Distance Education Council
DMC – developing member country
FDI – foreign direct investment
FFE – foreign-funded enterprise
FIE – foreign investment enterprise
FII – foreign institutional investor
FTC – foreign trade company
GDP – gross domestic product
IEA – International Energy Agency
ICRA – Indian Credit Rating Agency
ICFTU – International Confederation of Free Trade Unions
ICRIER – Indian Council for Research on International Economic Relations
ICT – information and communications technology
IIM – Indian Institute of Management
IIT – Indian Institute of Technology
ILO – International Labour Organization
IMF – International Monetary Fund
IPO – initial public offering
IPPS – Institute of Public Policy Studies
IT–BPO – information technology–business process outsourcing
ITES – information technology-enabled service
MOF – Ministry of Finance
MSE – micro and small enterprise
NAAC – National Accreditation and Assessment Council
NASSCOM – National Association of Software and Services Companies
NDRC – National Development and Reform Commission
NEN – National Expressway Network
NPL – nonperforming loan
NTHS – National Trunk Highway System
OECD – Organisation for Economic Co-operation and Development
PRC – People’s Republic of China
PSU – public sector undertaking
RBI – Reserve Bank of India
SASAC – State-Owned Assets Supervision and Administration Commission
SEBI – Securities and Exchange Board of India
SERC – State Electricity Regulatory Commission
SEZ – special economic zone  
SIP – share issue privatization  
SME – small and medium-sized enterprise  
SOE – state-owned enterprise  
SPC – State Power Company  
STPI – Software Technology Parks of India  
TFP – total factor productivity  
TVE – township and village enterprise  
UGC – University Grants Commission  
UNDP – United Nations Development Programme  
UNCTAD – United Nations Conference on Trade and Development  
VAT – value-added tax  
WTO – World Trade Organization

**Note**

The fiscal year (FY) of the Government of India ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2008 ends on 31 March 2008.
The developmental successes of the People's Republic of China (PRC) and India are reshaping the economic landscape of not only Asia but also the world. The diverse and rich development experiences of these two countries emanate from the wide differences in their economic policies and systems, dissimilarities in their institutions, and their social diversities. However, their development challenges are similar. The PRC and India can learn from each other’s experience in meeting their common challenges. The successes and failures of the PRC and India in their quest to transform and grow will also provide some valuable insights on development policy to other developing countries in Asia. At the 39th Annual Meeting of the Asian Development Bank (ADB) in Hyderabad, India, the Prime Minister of India suggested that ADB supports studies on the development experience of the PRC to benefit India and other developing countries. The Ministry of Finance of the Government of the People's Republic of China supported the suggestion and also expressed its interest in studying India's development experience. Responding to these requests, ADB provided a technical assistance grant (RETA 6398: A Program of Studies on the Development Experience of the PRC and India) for conducting the studies. The program started in August 2007.

This book puts together studies supported by the program that were conducted by scholars from the PRC on India’s development experience, and by scholars from India on the PRC’s experience. The Institute of Public Policy Studies of Peking University and the Indian Council for Research on International Economic Relations were selected to conduct the studies. Scholars from the PRC studied India’s experience in (i) macroeconomic management during the reform period; (ii) the growth of information technology-based services sector; (iii) the professional and higher education sector’s contribution to growth; (iv) the finance sector, capital market reforms, and the use of sophisticated financial instruments; and (v) the growth of internationally competitive local entrepreneurship. Scholars from India studied the PRC’s experience in (i) macroeconomic management during the reform period; (ii) financing and implementation of infrastructure projects; (iii) foreign direct investment–funded and export-oriented mass manufacturing; (iv) state-owned enterprise reforms and restructuring; and (v) labor sector reforms.

The book provides an in-depth analysis of reforms and developments in selected sectors of the two large dynamic emerging market economies. The overview chapter provides an analytical summary of the findings from the sector studies, and draws inference for development policy in other developing countries in Asia and the Pacific. The findings of the studies were presented at an international seminar held in Ha Noi, Viet Nam in September 2008 and subsequently revised to incorporate the comments received. This volume contains the revised and edited versions of the papers.
The findings of the studies are of strategic importance and practical use not only to the governments of the PRC and India but also other developing countries and emerging market economies. The publication of these studies also fulfills a key objective of the technical assistance, which is to disseminate development lessons throughout Asia and the Pacific.

Haruhiko Kuroda
President
Asian Development Bank
Acknowledgments

The collection of papers in this book was prepared as part of an Asian Development Bank (ADB) technical assistance project, “A Program of Studies on the Development Experience of the People’s Republic of China (PRC) and India.” Isher Judge Ahluwalia, chairperson, Indian Council for Research on International Economic Relations, New Delhi; and Ning Sao, director, Institute of Public Policy Studies of Peking University provided able leadership to scholars from India and the PRC. Yoshihiro Iwasaki, professor at the Asian Institute of Management prepared the overview study.

Wang Changyun, Renmin University of China; Zongchao Peng, Tsinghua University; Xiang Tang, Peking University; Li Wang, Chinese Academy of Social Sciences; and Qingjie Xia, Peking University peer-reviewed the papers on the PRC done by the scholars from India.

Shankar Acharya, former chief economic advisor to the Government of India; Saumitra Chaudhuri, economic advisor to the Prime Minister of India; Pratap Bhanu Mehta, president of the Center for Policy Research; Nachiket Mor, deputy managing director, ICICI Bank Limited; and Ila Patnaik, senior fellow, National Institute of Public Finance and Policy peer-reviewed the papers on India done by the scholars from the PRC.

Wu Jinkang, deputy director general, Ministry of Finance, PRC; Arvind Mayaram, joint secretary, Ministry of Finance, India; and Klaus Gerhaeusser, H. Satish Rao, and Kunio Senga, directors general of ADB provided overall guidance to the study as steering committee members. V. B. Tulasidhar, principal economist, East Asia Department, prepared and supervised the project. Ruby Ann Pimentel-Prenio provided research assistance.
1 Lessons from the People’s Republic of China and India

Yoshihiro Iwasaki

The People’s Republic of China (PRC) and India are the fastest-growing economies in the world, and most projections indicate that both economies will continue their rapid growth in the foreseeable future. Long-term projections also show that the PRC and India will be among the world’s five largest economies by 2050.²

Their outstanding economic performance was triggered and has been supported by wide-ranging economic reforms implemented over the past few decades. As will be seen in the following sections, the PRC and India can benefit extensively from learning about each other’s reform experiences. The two countries’ reform experiences are of great interest to many other developing countries as well. The economic performance of the PRC and India will have a significant impact on the prospects of Asia and the Pacific given the size and the pace with which these economies are growing. Moreover, the reform measures undertaken by the PRC and India may actually contain useful lessons in designing and implementing reform programs in other developing countries.

In this chapter, lessons learned from the policy and institutional reforms implemented by the PRC and India are summarized, based on 10 studies conducted by the Indian Council for Research on International Economic Relations (ICRIER) and the Institute of Public Policy Studies (IPPS) teams. The studies’ findings are augmented by supplementary information and analyses to place both countries’ reform experiences in a broader perspective and to make them more relevant to each other and other developing countries.

---

1 Professor at the Asian Institute of Management and retired director general of ADB’s South Asia Department. The author would like to thank Klaus Gerhaeusser, Juzhong Zhuang, and V. B. Tulasidhar for their valuable comments; and Ruby Ann Pimentel-Prenio for her excellent assistance.

2 Goldman Sachs (2003) predicted that the PRC will become the second and India the fifth largest economies of the world by 2050. More recently, PricewaterhouseCoopers (2008) projected that the PRC could overtake the United States in around 2025 to become the world’s largest economy and that India could become the third largest by 2050. These long-term forecasts are unlikely to be affected by the ongoing financial crisis as both countries seem to have emerged out of it with only marginal impact on their economic performances.
Initial Conditions

Similarities

Early Achievers
Despite the rapid growth for the last 2–3 decades, the PRC and India are still classified as lower middle-income countries, underscoring that the two economies took off when their per capita incomes were still very low. After comprehensive reform programs were launched, economic growth accelerated. In addition, gross domestic product (GDP) growth rates—which are markedly higher than the long-term averages in the pre-reform periods—have since been sustained. The PRC began its fast economic growth in the mid-1980s, when its per capita GDP was about $290 (in constant 2000 US dollars), which was not much higher than that of the Lao People's Democratic Republic ($218) and one-half that of Indonesia ($474) at that time. India began its accelerated growth in the mid-1990s, when its per capita GDP was $372, which was similar to that of Viet Nam ($305) and about 40% of that of the Philippines ($913).

In 2006, the PRC’s per capita income was similar to Japan’s in the mid-1960s and the Republic of Korea’s in the mid-1980s. At the respective points of reference, both Japan and the Republic of Korea had gone through only about a decade of rapid growth, whereas the PRC had already experienced 25 years of rapid growth. India’s per capita income in 2006 was similar to that of Japan in the mid-1950s and that of the Republic of Korea in the mid-1970s. While India had already experienced rapid growth for about a decade, by the time of comparison, Japan and the Republic of Korea had barely begun their economic spurts. This implies that the PRC and India began their rapid economic growth when they were much poorer than Japan and the Republic of Korea. The PRC and India still have low per capita incomes, which signify that both countries are likely to enjoy the “advantage of backwardness” (or the Gerschenkron effect) for a few more decades as their productivity continues to catch up with that of leading economies.

Large Domestic Markets
One factor behind both countries’ successful take off at an early stage of development may have been their very large sizes. As both are the world’s most populous countries, their domestic markets are already large—even when their per capita incomes were still classified as among the lowest in the world. The PRC’s GDP (in constant 2000 US dollars) was $183 billion in 1980, which was 50% larger than the Republic of Korea’s GDP ($122 billion) in the same year. In 1990, India’s GDP was $270 billion, which was similar to that of the Republic of Korea ($284 billion).

---

3 The classification of income groups used by international financial institutions is based on per capita gross national income and comprises low-income ($935 or less), lower middle-income ($936–$3,705), upper middle-income ($3,705–$11,455), and high-income ($11,456 or more) countries in 2007.
4 “Takeoff” is a crucial stage of economic development when a developing country enters into sustained rapid growth as a result of increased savings and investment rates.
5 This paragraph draws on Li and Zhang (2008).
Table 1: Key Indicators for Selected Asian Developing Countries, 2006

<table>
<thead>
<tr>
<th>Indicator</th>
<th>PRC</th>
<th>India</th>
<th>Bangladesh</th>
<th>Cambodia</th>
<th>Indonesia</th>
<th>Lao PDR</th>
<th>Malaysia</th>
<th>Nepal</th>
<th>Philippines</th>
<th>Pakistan</th>
<th>Sri Lanka</th>
<th>Thailand</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (million)</td>
<td>1,312.0</td>
<td>1,110.0</td>
<td>159.0</td>
<td>14.0</td>
<td>226.0</td>
<td>6.0</td>
<td>27.0</td>
<td>28.0</td>
<td>88.0</td>
<td>162.0</td>
<td>20.0</td>
<td>64.0</td>
<td>85.0</td>
</tr>
<tr>
<td>GDP ($ billion, constant 2000 $)</td>
<td>2,364.4</td>
<td>770.2</td>
<td>69.7</td>
<td>7.0</td>
<td>233.2</td>
<td>2.7</td>
<td>125.2</td>
<td>6.8</td>
<td>106.9</td>
<td>107.3</td>
<td>22.8</td>
<td>173.2</td>
<td>52.5</td>
</tr>
<tr>
<td>GDP growth (% past 5 years average)</td>
<td>10.1</td>
<td>7.8</td>
<td>6.1</td>
<td>10.6</td>
<td>5.5</td>
<td>6.9</td>
<td>5.8</td>
<td>3.4</td>
<td>5.8</td>
<td>6.6</td>
<td>6.4</td>
<td>5.6</td>
<td>8.0</td>
</tr>
<tr>
<td>GDP per capita (constant 2000 $)</td>
<td>2,096</td>
<td>703</td>
<td>439</td>
<td>482</td>
<td>1,034</td>
<td>462</td>
<td>4,715</td>
<td>243</td>
<td>1,216</td>
<td>660</td>
<td>1,144</td>
<td>2,713</td>
<td>617</td>
</tr>
<tr>
<td>Agriculture share in GDP (%)</td>
<td>11.9</td>
<td>17.6</td>
<td>18.9</td>
<td>30.1</td>
<td>13.8</td>
<td>42.0</td>
<td>8.5</td>
<td>33.8</td>
<td>13.5</td>
<td>19.6</td>
<td>11.7</td>
<td>10.8</td>
<td>20.4</td>
</tr>
<tr>
<td>Industry share in GDP (%)</td>
<td>47.0</td>
<td>27.7</td>
<td>28.6</td>
<td>26.2</td>
<td>46.7</td>
<td>32.5</td>
<td>50.6</td>
<td>17.2</td>
<td>31.3</td>
<td>26.8</td>
<td>29.9</td>
<td>43.9</td>
<td>41.6</td>
</tr>
<tr>
<td>Services share in GDP (%)</td>
<td>41.1</td>
<td>54.7</td>
<td>52.6</td>
<td>43.7</td>
<td>39.4</td>
<td>25.5</td>
<td>40.9</td>
<td>49.1</td>
<td>55.2</td>
<td>53.7</td>
<td>58.4</td>
<td>45.3</td>
<td>38.1</td>
</tr>
<tr>
<td>Gross domestic investment (% of GDP)</td>
<td>44.6</td>
<td>33.9</td>
<td>24.3</td>
<td>21.5</td>
<td>24.9</td>
<td>32.5</td>
<td>23.1</td>
<td>25.4</td>
<td>15.0</td>
<td>23.0</td>
<td>27.2</td>
<td>29.9</td>
<td>35.3</td>
</tr>
</tbody>
</table>

continued on next page
<table>
<thead>
<tr>
<th></th>
<th>PRC</th>
<th>India</th>
<th>Bangladesh</th>
<th>Cambodia</th>
<th>Indonesia</th>
<th>Lao PDR</th>
<th>Malaysia</th>
<th>Nepal</th>
<th>Philippines</th>
<th>Pakistan</th>
<th>Sri Lanka</th>
<th>Thailand</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross domestic savings</td>
<td>52.5</td>
<td>31.1</td>
<td>17.4</td>
<td>14.5</td>
<td>28.9</td>
<td>26.2</td>
<td>37.1</td>
<td>9.4</td>
<td>10.4</td>
<td>14.7</td>
<td>17.6</td>
<td>33.4</td>
<td>27.4</td>
</tr>
<tr>
<td>Inflation (CPI) (%)</td>
<td>2.6</td>
<td>4.8</td>
<td>7.6</td>
<td>4.3</td>
<td>8.6</td>
<td>8.9</td>
<td>2.2</td>
<td>5.8</td>
<td>5.2</td>
<td>7.0</td>
<td>11.3</td>
<td>3.2</td>
<td>7.0</td>
</tr>
<tr>
<td>Fiscal balance (as % of GDP)</td>
<td>0.7</td>
<td>(3.1)</td>
<td>(3.3)</td>
<td>(1.2)</td>
<td>(1.2)</td>
<td>(2.7)</td>
<td>(3.2)</td>
<td>(2.0)</td>
<td>(0.2)</td>
<td>(4.0)</td>
<td>(6.9)</td>
<td>(1.7)</td>
<td>(5.4)</td>
</tr>
<tr>
<td>FDI net inflows (%)</td>
<td>2.9</td>
<td>1.9</td>
<td>1.1</td>
<td>6.7</td>
<td>1.5</td>
<td>5.5</td>
<td>3.9</td>
<td>(0.1)</td>
<td>2.0</td>
<td>3.4</td>
<td>1.7</td>
<td>4.4</td>
<td>3.8</td>
</tr>
<tr>
<td>Total trade (%)</td>
<td>72.0</td>
<td>45.8</td>
<td>50.8</td>
<td>144.6</td>
<td>54.7</td>
<td>78.2</td>
<td>210.0</td>
<td>41.0</td>
<td>83.3</td>
<td>38.6</td>
<td>68.8</td>
<td>132.5</td>
<td>159.3</td>
</tr>
<tr>
<td>External current account</td>
<td>9.4</td>
<td>(1.0)</td>
<td>1.9</td>
<td>(5.9)</td>
<td>2.5</td>
<td>NA</td>
<td>16.0</td>
<td>0.1</td>
<td>5.0</td>
<td>(5.3)</td>
<td>(4.7)</td>
<td>6.1</td>
<td>(9.8)</td>
</tr>
<tr>
<td>balance (as % of GDP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign exchange reserves</td>
<td>13.5</td>
<td>6.1</td>
<td>2.6</td>
<td>3.8</td>
<td>5.4</td>
<td>NA</td>
<td>6.7</td>
<td>6.7</td>
<td>4.3</td>
<td>(4.0)</td>
<td>2.9</td>
<td>6.0</td>
<td>4.1</td>
</tr>
<tr>
<td>(in months of imports)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

( ) = negative numbers, CPI = consumer price index, FDI = foreign direct investment, GDP = gross domestic product, Lao PDR = Lao People’s Democratic Republic, PRC = People’s Republic of China.

* Central government fiscal deficit. For the PRC and Bangladesh, this refers to consolidated government balance.

Sources: ADB 2008, Key Indicators; World Development Indicators Online.
Typically, low per capita income at an early stage of development means that the lack of domestic demand must be compensated by exports to achieve economies of scale, higher productivity, and international competitiveness. However, thanks to the large size of their domestic economies, the PRC and India could realize economies of scale at an earlier stage of development than most other developing countries. A larger domestic market is also an advantage in negotiating trade contracts—including those for importing energy, minerals, food, and other natural resources—and makes the country more attractive for foreign direct investment (FDI), particularly horizontal FDI that targets the host country’s domestic market.

**Demographic Dividend**

The demographic dynamics of their economies were also working in favor of the takeoff of the PRC and India. As shown in Figure 1, rapid economic growth in both countries coincided with a long-term decline in the age dependency ratio, as was the case in Japan and the Republic of Korea. In the PRC and India, the age dependency ratio began to fall rapidly in the mid-1970s. A sharp decrease had also begun in 1950 in Japan and in 1965 in the Republic of Korea, which coincided with periods of fast economic growth.

Demographic dividends brought about by a sustained, rapid fall in the age dependency ratio were important factors that contributed to the acceleration of GDP growth in the PRC and India at an early stage of development. A common cause for the decline in the age dependency ratio is a trend fall in the population growth rate. The population growth rate in India fell from almost 2.30% in 1980 to 1.44% in 2006. In the PRC, the rate declined from 1.37% to 0.62% during the same period as a result of the one-child policy adopted in 1979. It must be emphasized, however, that such a demographic trend does not automatically provide demographic dividends. It only provides conditions for faster growth if additions to the labor market are of adequate quality to meet the market requirements of a growing economy.

While the sustained, long-term fall in the age dependency ratio was an important factor underlying the acceleration of economic growth in the two countries, there were also important differences. First, the age dependency ratio fell in the PRC from 78% in 1975 to 42% in 2005, which was significantly faster than the fall from 77% to 58% in India over the same period. The PRC, therefore, appears to have benefited much more from the demographic dividend, which may be part of the reason for its faster average growth rate. Second, as is observed in Figure 1, the future trend of the age dependency ratio is projected to follow very different patterns in each country. In the PRC, the ratio is projected to hit bottom during 2010–2015 and begin to rise quickly thereafter. In contrast, the ratio is projected to continue its gradual decline until around 2035 in India. This is consistent with the long-term projections that the average growth rate will be faster in India than in the PRC over the next few decades.

---

6 Studies show that demographic conditions affect growth performance significantly. Mason (2003) estimated that up to one-third of economic growth in East Asian countries can be explained by demography.

7 The age dependency ratio is a ratio between the non-working population (below 15 years old and above 65 years old combined) and the working age population (15–65 years old).

8 See particularly Li and Zhang (2008).

9 For instance, PricewaterhouseCoopers (2008) projected an average GDP growth rate of 8.5% for India and 6.8% for the PRC between 2007 and 2050.
Developments in the external environment triggered by the information and communications technology (ICT) revolution were also favorable when the two economies were about to take off. Since the late 1980s, the global production network (or international value chain) has become a predominant mode of operation for multinational corporations, particularly in manufacturing. Typically, the lead firm of a global production network fragments the production process into several sub-processes and assigns them to different geographical locations that are best suited for the respective activities. Within a relatively short time, the PRC emerged as a major exporter of a broad spectrum of manufactured products, encompassing both labor-intensive and capital- or technology-intensive products and reflecting its successful integration into the global production network system in the manufacturing sector. There, the PRC firms are typically engaged in relatively labor-intensive sub-processes (e.g., final assembly and testing), although some have successfully moved up the technological ladder to

---

**Figure 1: Demographic Dividend**

Source: Li and Zhang 2008.

**Information and Communications Technology Revolution and Global Production Networks**

Developments in the external environment triggered by the information and communications technology (ICT) revolution were also favorable when the two economies were about to take off. Since the late 1980s, the global production network (or international value chain) has become a predominant mode of operation for multinational corporations, particularly in manufacturing. Typically, the lead firm of a global production network fragments the production process into several sub-processes and assigns them to different geographical locations that are best suited for the respective activities. The international comparative advantage is thus defined in terms of the factor intensity of sub-processes in which a country is engaged rather than by the factor intensity of products it produces. A labor-abundant country has the comparative advantage in labor-intensive activities regardless of the overall factor intensity of the final products involved.

Within a relatively short time, the PRC emerged as a major exporter of a broad spectrum of manufactured products, encompassing both labor-intensive and capital- or technology-intensive products and reflecting its successful integration into the global production network system in the manufacturing sector. There, the PRC firms are typically engaged in relatively labor-intensive sub-processes (e.g., final assembly and testing), although some have successfully moved up the technological ladder to

---

10 Production is divided into sub-processes covering research and development, product design, production of key components, production of general parts, procurement, final assembly, testing, marketing and logistics, and post-sales services.
more sophisticated skill-intensive tasks (e.g., product design and production of key components).

More recently, a similar fragmentation of production began in the services sector. This was introduced by information technology firms in the United States and other developed countries to cut production costs and to sharpen their technological edge. Simple or standardized production tasks were outsourced, shifting more internal resources toward the firm’s core competencies. With further progress in ICT—particularly development of the internet—the production network for computer software and other information technology services expanded rapidly across national borders. The creation of global production networks for information technology services also led to similar arrangements for other information technology-enabled services (ITESs) such as accounting, legal, medical transcription, pharmaceutical, and other business process outsourcing services. These developments broadened the scope and channels through which India's firms could cater to the foreign market.

The proliferation of global production networks in the manufacturing and services sectors provides firms in developing countries with opportunities to participate in the production of capital- or technology-intensive goods and services for which their countries do not have a comparative advantage (i.e., if they are to carry out the complete process of production for such products). These networks have dramatically lowered the entry barriers to these industries for developing countries. In the past, developing countries had to acquire necessary levels of the physical and human capital before they embarked on a capital- or technology-intensive industry. Industrialization used to be a step-by-step process wherein developing countries moved from labor-intensive industries to light industries, and to capital- or technology-intensive industries. Global production networks, however, enable developing countries to compress this process by assigning their firms initially to labor-intensive, technologically simple tasks, and giving them time to climb the technological ladder to more sophisticated activities.\footnote{Traditional, vertically integrated global production networks—as compared with the contract manufacturing type—are considered to have more favorable impact on transfer of technology to the host country. Under a vertically integrated network, successful member firms have moved from own-equipment manufacturing to own-design manufacturing and own-brand manufacturing.}

In the case of the services sector, the change brought about by the ICT revolution has been even more fundamental than in manufacturing. The proximity requirement of the producer and consumer has been removed for a variety of services, transforming them from the non-tradable to tradable category. The resultant growth in international trade and the establishment of global production networks in services had paved the way for India to achieve a services sector-led acceleration in overall economic growth. It was also crucial for India's takeoff that the growth in production and export of services was much less affected than manufacturing by physical infrastructure constraints.

In both manufacturing and services sectors, the success of a global production network depends on its ability to transfer technology and skills to member firms, to invent new products, and to improve production process. To participate and succeed in such a network, local firms are required to possess adequate human resources to absorb cutting-edge technologies of the lead firm and to contribute to the network's innovation efforts. The location of global production network facilities also requires the provision of modern transport and telecommunications infrastructure, existence of government policies conducive to smooth cross-border movement of intermediate products and personnel, and protection of intellectual property.
Predominance of the State Sector Before Reforms

For 30 years—since the establishment of the PRC in 1949—the country ran its economy under a socialist, centrally planned system in which all production was overseen by the government and state-owned enterprises (SOEs). During that period, the government had always favored the public sector and discriminated against the private sector. From 1978, however, the PRC has implemented a comprehensive program of market-oriented reforms, with a view to realizing a socialist market economy.12

After independence from the United Kingdom in 1947, India adopted a softer variant of socialism whose principal objective was to mitigate social ills caused by the market-based economic regime. The government did not intend to eradicate the private sector but assigned “commanding heights” to public enterprises by reserving strategic sectors exclusively for them and restricting the private sector to selected sectors through an elaborate system of licensing and control on the magnitude of their operations (Saraf 2008).

Thus, SOEs were predominant in the PRC and crucial in India prior to the inception of economic reforms. The restructuring of SOEs, including that of labor relations, had broad economic and social implications, and implementation was politically sensitive. The share of SOEs in both countries has declined since reforms. In the PRC, they accounted for 62% of industrial output in 1985, 51% in 1990, and 35% in 2004 (National Bureau of Statistics of China n.d.). In India, the SOE GDP share (i.e., public sector undertakings) was 15.9% in 1991, 14.8% in 2000, and 11.1% in 2006 (Ministry of Statistics and Programme Evaluation n.d.).

From an Inward-Looking to Outward-Looking Strategy

In the pre-reform period, the PRC was operating its economy under an extremely inward-looking development strategy. Economic policies followed the principle of autarky (i.e., self-sufficiency), which required full use of domestic resources and establishment of a comprehensive range of industries in the country. Self-sufficiency was to be pursued not only at the national but also at the provincial level. The country’s policy stance was, therefore, against international division of labor or specialization, although foreign economic transactions were not completely dismissed. The principle of self-sufficiency was motivated by national security and desire for mastery of manufacturing technology. By the mid-1970s, PRC leaders became concerned about widening gaps with neighboring countries in economic growth and per capita income, which they attributed to technological disparity. To bring the economy to a higher growth path, the PRC decided to break away from the traditional principle of self-sufficiency and adopt an outward-looking, export-oriented growth strategy. Thus, liberalization of trade and investment was implemented soon after economic reform was launched in 1978.13

For about 3 decades after independence (1947–1980), India’s economic policy was also guided by a model of national self-sufficiency and based on an inward-looking, import-substitution industrialization strategy. The pursuit of self-sufficiency was partially driven by a belief that there was a value to minimizing India’s external dependence and producing what it needed itself, even if it meant high costs and low efficiency (Bhagwati and Desai 1970). Economic reform launched by India in 1991 was triggered by a balance of payment crisis and was aimed at addressing macro-

---

12 The concept of a socialist market economy was formally endorsed by the Communist Party of China in October 1992.
13 The paragraph draws heavily on Jaggi et al. (1996).
Lessons from the People's Republic of China and India

economic imbalances and enhancing the international competitiveness of domestic industries. The initial focus of India’s liberalization was to lift internal controls to create more space for the private sector and to provide time to improve their efficiency. External liberalization was gradual, primarily to buy support for reforms from the business community, to create a level playing field before domestic companies could face international competition, and to protect some segments of domestic economic activity. Excessive reliance on import duties for raising government revenues also limited the ability of the government to reduce the level of protection.

Thus, for both countries, reform in the external regime was not just a systematic liberalization of trade and investment but a historic paradigm shift from an inward-looking developmental strategy driven by self-sufficiency to an outward-looking strategy based on international division of labor.

Gradual and Sequential Approach to Reform
In the PRC, the gradual and cautious approach—which Deng Xiaoping described as crossing the river while feeling the rocks—has been maintained throughout the reform process. In fact, the PRC’s economic reform is distinguished from reforms in the transition economies of Central and Eastern Europe mainly for its gradualist approach. The PRC’s success in preventing massive upheavals that other transition economies faced has been the dominant argument used to bolster the case for gradual reform. The implementation of reforms in the PRC was not only gradual in the temporal sense but also sequential across sectors and geographical areas. Reforms were first initiated in agriculture, followed by industry, resulting in more resources in the hands of individuals and enterprises to invest. Fiscal reforms, mainly by way of greater decentralization, meant that local governments had more resources to invest in developing local infrastructure and local enterprises. The external sector was liberalized next in a series of steps designed to promote greater openness.

The reform in India has also been gradual and sequential. Prior to the current reform, internal liberalization had been underway since the mid-1980s through steady liberalization of the internal licensing system. Begun in 1991, first-generation reforms covered fiscal stabilization, external sector liberalization, deregulation of industry, financial sector reform, and a more commercial approach to the public sector. The underlying rationale running across these reforms was to give a greater market orientation to the economy and to let competitive forces and growth impulses to come into fuller play. Subsequently, second-generation reforms, launched in the mid-1990s, focused on restructuring the power, telecommunications, transport, and other sectors with a view to improving efficiency, promoting private sector participation, and consolidating the fiscal operations of state governments.

Differences
Role of Local Governments
A unique feature that distinguishes the PRC’s development experience from that of India and many other countries is the leading role played by local governments. Throughout the post-reform period in the PRC, local governments have been dominant players in a range of areas that are critical to the industrialization and accelerated growth of regional economies. The inimitability lies in the fact that local governments have been active not only as facilitators (e.g., through the build-up of physical infrastructure and provision of social services) but also as the investors and managers of industrial enterprises.
Before reform in 1978, the ownership of the PRC SOEs was transferred to local governments. Soon after reforms were launched, local governments were allowed to create and operate township and village enterprises (TVEs) within their jurisdictions.

In India, like in most other countries, the local government’s role in economic development in the post-reform period has largely been that of facilitator and regulator. The state (i.e., provincial) governments continued to manage existing SOEs, but did not get involved in establishing and managing new industrial enterprises.

Because local governments in the PRC acted as facilitators, regulators, investors, and managers, a coordination failure was essentially eliminated for investment by TVEs and SOEs and reduced for private enterprises, including FDI. Besides, local governments offered tax and other administrative preferences as well as modern infrastructure facilities to attract FDI, which in turn provided local economies with access to funds, technologies, managerial skills, and overseas markets. In some cases, local governments also helped secure the labor force for their urban industries through flexible application of the *hukou* system (a system of residency permits requiring household registration) to migrant rural workers, including those from other regions.

Several factors enabled local governments to play a leading role in the PRC’s industrialization. First, local governments are run under a dual power structure—Communist Party of China leaders at all local levels are appointed by the party’s higher echelons, administrative heads are elected locally, and local party leaders (i.e., secretary generals) are placed above the administrative heads (e.g., governors and mayors). This dualistic hierarchical system has helped reduce coordination failure in government policies and public investment programs between the center and provinces, and among different tiers of local governments. Since the outset of reform, regional economic growth has been the single most important norm by which the performance of both the party and administrative cadres is evaluated.

Second, reforms in the PRC were driven by decentralization of decision making, which gained momentum during the 1970s. The devolution of SOE ownership in the run-up to the reforms reflected this policy trend. Fiscal operations were also decentralized after the reform. Despite the subsequent recentralization by the 1994 fiscal reform, PRC local governments are still given relatively large expenditure responsibilities compared with other countries. Third, PRC local governments have been under soft budget constraints because of a large amount of off-budget resources such as retained earnings of SOEs, levies, and surcharges; and revenues from leasing and sale of land. Furthermore, these local governments can also use enterprises under their control to get access to bank loans, although they are not allowed to borrow directly.

Some factors underlying the critical contributions made by local governments to the country’s rapid economic growth are closely linked to the PRC’s particular socio-political conditions and may not be replicable in other developing countries. However, the PRC experience demonstrates how important it is for a developing country to minimize coordination failure among different parts of the government, and between the government and domestic and foreign investors to accelerate economic growth.

**Market-Oriented Institutions**

India had the obvious advantage of a culture of entrepreneurship as well as market-based institutions, many of which had developed and evolved since the pre-independence period. Among such institutions were old, large private firms; banking system and capital markets; regulatory agencies; and a modern system of laws and judiciary. They served as the basis on which to build new institutions and provided
technical and other support to the formulation and implementation of reforms in their respective areas.

In contrast, the PRC had virtually no functioning market-based institutions in the pre-reform period and had to create many of them from scratch. For instance, prior to the reforms, the financial sector did not exist. Instead, there was a state apparatus for collecting and redistributing taxes. The People’s Bank of China was responsible for these functions as well as for settling credits and debits with other countries and areas. Fiscal and monetary institutions for modern macroeconomic management had also to be put in place.

**Growth versus Stability**

In the pre-reform period, although the PRC was not faced with any crisis at the macroeconomic level, there was growing discontent with the economic system—especially in rural areas—about slow improvement in living standards, partly due to shortages of consumer goods. Leaders recognized that unless the technological disparity between the PRC and the neighboring countries was effectively addressed, gaps in economic growth would only widen (IMF 1993). The PRC began its market-oriented reform in 1978 with a multitude of purposes, but the primary aim was faster economic growth.

India began its comprehensive reform a decade later with the immediate purpose of overcoming the foreign exchange crisis of the early 1990s. Although economic growth surged during the 1980s, it was achieved with large fiscal deficits and foreign borrowings and without significant restructuring of the economy. Rising trade and current account deficits, a deteriorating external debt profile, and dwindling foreign reserves pushed India’s balance of payments into a crisis in 1990–1991. The government undertook stabilization policies aimed at correcting the macroeconomic imbalances. The fiscal deficit was cut, and special balance of payments financing was mobilized from international financial institutions to restore foreign reserves. In addition, the government seized the opportunity offered by the crisis to launch a comprehensive program of structural reforms (Chapter 7).

While the PRC focused more on acceleration of economic growth, India’s policy priority was to overcome macroeconomic imbalances—although later, the PRC also experienced a period of high inflation and deteriorating balance of payments when macroeconomic stabilization became a top policy concern. The PRC’s sharper strategic focus on economic growth explains the comprehensive and well-integrated nature of the country’s reform program in the real sector, encompassing agriculture as well as rural and urban industries. On the other hand, the reform of the financial sector was implemented in earnest only after significant progress was achieved in restructuring the real sector (Ping 2003).

**Industry versus Services**

A widely held view is that PRC’s growth has been industrial sector-led, similar to previous episodes of newly industrialized economies in East Asia, while India’s growth has been driven by the information technology and other services sectors. It must be underscored, however, that it is difficult to ascertain such contrasting patterns of development from national account statistics. Table 2 depicts the long-term change in the sector composition of GDP of the two countries. In the PRC, the GDP share of the industrial sector declined marginally from 48.5% in 1980 to 47.5% in 2005. The services sector’s share, on the other hand, almost doubled over the same period from
21.4% to 40.0%. The numbers contradict the above viewpoint and indicate that the services sector has contributed notably to the PRC’s economic growth since 1980.

Some factors may have caused significant upward bias on the GDP share of services in the PRC. First, restructuring of industrial SOEs—which began in the second half of the 1980s—has likely resulted in a substantial loss in the industrial sector’s share in favor of the services sector. The industrial SOEs’ services functions (e.g., hospitals, schools, and transport units) were spun off as separate entities and reclassified to the services sector.

Second, with reforms, the PRC began the transformation of its official GDP statistics from the traditional material product system to the system of national accounts. The material product system—used under the past socialist, centrally planned system—was based mainly on goods (or tangible output) and did not cover the government and other services (except for transport and communications services that are directly used in the production of goods). As the conversion to the system of national accounts progressed over time, services have become more fully covered by GDP statistics, which would have added to the upward bias in the long-term trend of the services sector’s share.14 Due to these factors, the growth rate and trend increase in the GDP share of the services sector may have been overstated in the national accounts. Thus, it is not possible to make a rigorous, long-term assessment of the sector contributions to GDP growth in the PRC.

In India, the GDP share of the industrial sector increased marginally from 26.9% in 1990 to 27.6% in 2005. Although the industry’s share has remained virtually unchanged in both countries in the post-reform periods, the PRC’s industry has always been much more dominant in the economy than that in India. In contrast, the GDP share of India’s services sector has increased from 43.8% to 54.1%. While the services sector’s share increased even faster in the PRC, the services sector’s share has been much larger in India throughout that period. In this regard, it is interesting to note that the services sector’s share in India is not exceptionally large. In fact, most developing countries in South Asia and the Philippines have similarly large services sectors (Table 2). What is unique about India’s services sector, however, is the key role that information technology and ITESs have played in accelerating the growth of that sector and the overall economy.

14 In principle, the PRC switched to a system of national accounts in 1992, but the conversion has been slow and does not seem to be complete yet. See Takahashi (2006).
A study by the International Monetary Fund (2006) compared the actual GDP share of sectors with predicted shares, which are obtained by cross-country regression based on key parameters such as output per capita, geographic size, and population. For both countries, the agriculture output share is what one would expect. For India, the actual output shares for industry and services are also close to the predicted levels. However, the PRC’s industrial sector accounts for an unusually large share of output, while its services sector accounts for a much smaller share than predicted. In fact, among the developing countries in Table 1, only Malaysia, whose per capita income is more than twice as high, has an industrial share higher than the PRC. Table 2 indicates that these characteristics in the PRC were already evident in the sector shares in the pre-reform period.

### Decentralized Implementation versus Participatory Formulation of Reforms

Besides gradualism, decentralized implementation is a crucial and distinct characteristic of the reform process in the PRC. The provincial and lower levels of government played key roles in implementing reforms. While the formulation of reforms has mostly remained centralized, regional variations to reforms have been allowed to reflect divergent local conditions. Also, experiments are often conducted in selected localities before reforms are implemented countrywide. Decentralized implementation has proved effective in minimizing resistance to reforms, thanks to enhanced dialogue between implementing authorities and stakeholders at the grassroots level—overcoming a major disadvantage of gradualism, which is that the prolonged process allows opposition to emerge and grow (Chapter 2).

On the other hand, the reform process in India has been characterized by participatory nature of the formulation of reforms. Typically, the government sets up a commission (or series of commissions)—comprising scholars, private sector experts, and policy makers—to identify the problems and suggest a program of policy changes and structural reforms for a sector or a policy area. Once completed, the reform proposal is made public for broad-based debates. Given the divergence of views in the country, it is requisite for the success of a reform to involve a broad range of stakeholders in its formulation. For example, as the consensus was built, market-oriented reforms in large segments of the economy have become acceptable.

India is a federation, and the center and states are largely independent institutions with clear constitutional mandates. First-generation reforms—which covered macroeconomic management, trade and investment, the financial sector, and industrial sector—were mostly carried out by the central government, while some components of second-generation reforms as well as fiscal reforms were implemented by state governments according to a clearly defined demarcation of responsibilities. For instance, the power sector is a concurrent (i.e., shared) sector—while the central government is responsible for generation and transmission, state governments are responsible for generation, transmission within the state, and distribution. In the last decade or so, state governments have become more proactive in implementing reforms to enhance economic growth in their own areas. As the role of private investment acquired greater significance in the overall economy, most states have been eager to attract foreign and domestic private investment and to introduce measures to expedite decision making, especially for the provision of land, electricity, water, and other infrastructure services to investors (Chapter 7).15

---

15 The PRC is not a federation but has most of the features of a large federal country. It is large and diverse, has several layers of government, and has a formal system of division of responsibilities between the center and provinces.
Summary of Key Findings and Lessons Learned

This section summarizes the key lessons learned from the development experience of the PRC and India, based on the findings of the 10 papers that are compiled in this book. Some, however, are not lessons or policy recommendations, but they were included to help understand the context in which policy recommendations were made. As the studies on the PRC were conducted by an Indian team (ICRIER) and those on India by a PRC team (IPPS), the authors’ primary interest was to draw lessons for their own country from the other country’s development experience. In this summary, supplementary remarks (e.g., additional data and analyses) will be provided with a view to facilitating the interpretation of the studies’ findings by readers from other developing countries as well as by those from the PRC and India.

In what follows, the lessons and other key findings quoted from the other chapters are italicized.

Development Experience of the People’s Republic of China

On the PRC’s development experience, the ICRIER team conducted five studies, including an overview and sector studies on physical infrastructure, manufacturing sector, SOEs, and labor market.


(i) Sustaining high levels of growth while keeping inflation in control is the most conspicuous feature of the PRC growth miracle. India and the PRC were comparably positioned around 1980, when the PRC initiated its reform program. While India’s growth rate since then has been lower and its stabilization policies less successful, they have broadly followed the same trend.

Economic growth. Figure 2 shows that the GDP growth in the PRC has been well above 8% per year for all but 2 years, and has averaged 10.1% for almost 3 decades (1980–2006), much longer than previous fast-growth episodes in East Asia. India’s growth has accelerated from the mid-1990s, exceeding 9% per year in the last few years, and averaging 6.9% over 1995–2007.

Inflation. The annual inflation rate, as measured by the consumer price index, was erratic in the PRC until the mid-1990s, soaring to almost 25% in 1994, but has since declined to low levels. The long-term average was 7.4% between 1987 and 2006. India’s average inflation rate was slightly higher at 7.7% for the same period, but it has mostly remained below 5.0% in the last decade. The erratic inflation rate pattern in the PRC until the mid-1990s may have reflected the pent-up demand for consumer goods created by chronic shortages in the pre-reform period as well as by the phased liberalization of commodity prices that continued into the 1990s.

(ii) An important facet of development policy in the PRC was the facilitation of high levels of investment. The returns from investment in agriculture increased as a result of market-oriented agricultural reforms. Agricultural surpluses were ploughed into local enterprises (mostly TVEs), while the higher returns from
Figure 2: Growth and Stability

**Annual Gross Domestic Product Growth (%)**

- **People's Republic of China**
- **India**

**Annual Inflation a (%)**

- **People's Republic of China**
- **India**

*a Based on consumer price index.
Source: World Development Indicators Online.
manufacturing were reinvested mostly in domestic infrastructure, thereby creating a virtuous cycle of investment-led growth.

**Domestic investment and savings.** Table 1 shows that in 2006, the PRC’s gross domestic investment ratio, at 44.6% of GDP, was 10 percentage points higher than India’s. It was supported by an extremely high domestic saving rate (52.5%) and substantial foreign capital inflows. After a significant rise in the previous years, domestic savings in India in 2006—at 31.1% of GDP—ranked among the highest in Asia and the Pacific region, although it was still substantially lower than the PRC’s rate.

There are several important policy issues underlying the differences in the savings and investment rates in the two countries. First, the PRC succeeded in creating an investment–growth–profit cycle by sequencing the implementation of reform from agriculture to township and village enterprises (TVEs), and then to state-owned enterprises (SOEs) and foreign direct investment (FDI). The reform in agriculture created a conducive environment for the development of nonfarm sectors in the rural economy. The growth in agricultural productivity and farmer income freed labor for TVEs and, at the same time, triggered a surge in demand for the latter’s products. TVEs also benefited from access to dynamic urban markets that had been freed up from the SOE monopoly. Entry of TVEs into the urban markets placed them in direct competition with SOEs, forcing SOEs to adopt measures to improve productivity, including investment to achieve greater economies of scale.

India had gone through a major reform of agriculture—known as the Green Revolution—from the mid-1960s to the early 1970s, long before the present reforms began. Agrarian reform at that time focused on the adoption of new technologies in crop production and did not extend to broader issues of development. Though the revolution resulted in a substantial improvement in output growth and yield of grains in the 1970s and 1980s and contributed to the achievement of the national food self-sufficiency, it did not lead to broad-based development of the rural economy.\(^{16}\) Agricultural production began to stagnate in the 1990s as the momentum of the reform was lost and public investment in the sector declined. To realize fully the beneficial impact of ongoing reform, India also needs to create an environment for bimodal synergies between agriculture and industry through a comprehensive rural reform covering both agriculture and nonagriculture sectors.

**Fiscal deficit and domestic savings.** Another important factor affecting India’s domestic saving rate is the fiscal deficit. Public savings in India are much lower than in the PRC, and they were negative during the Ninth Five Year Plan (1997–2002). The poor performance on this front may explain the higher rate of inflation and lower investment level through crowding out the private sector in the financial market. A higher rate of public sector savings is necessary for further acceleration—or even maintenance—of the current rate of growth with similar price stability (Chapter 2).

**Investment efficiency.** Efficiency of investment is equally important for economic growth as volume. The average incremental capital output ratio (ICOR) for the PRC and India was, respectively, 3.5 and 4.1 during the 1990s, 4.1 and 4.0 for the 2000s (2000–2006), and 4.2 and 3.6 for the last 4 years of this period. While the PRC’s domestic investment became less efficient in the 2000s than in the 1990s,

\(^{16}\) For more on the Green Revolution, see Bhalla (1983).
that of India became more efficient. India’s domestic investment has become about 15% more efficient than the PRC’s in recent years. This finding is also consistent with the growing concerns in the PRC about overheating domestic investment.

(iii) The PRC’s outward orientation, beginning in the early 1980s, was motivated by a multitude of factors. The subsequent export-oriented growth strategy sought to replicate East Asia’s successful development model while addressing a looming balance of payments problem. This meant developing the PRC as a global manufacturing hub, especially for low value added, light manufacturing, which has worked well.

Current account balance. Figure 3 shows that the PRC’s external current account balance fluctuated between –4% and 4% of GDP until 1994. Since then, the current account balance has surged upward, recording an exceptionally high surplus of 9.4% of GDP in 2006. The trend rise in the external account balance began when SOE restructuring and private sector industry development (including foreign-financed enterprises) were gathering momentum, and after the real exchange rate of the yuan depreciated sharply (Figure 5). India’s current account deteriorated from about –1% of GDP to below –2% during the 1980s. It has, however, improved consistently in the post-reform period and recorded surpluses in the early 2000s. Despite the improvement, however, India has not gotten rid of a balance of payment constraint on its growth like the PRC (Chapter 2).

(iv) In addition, capital inflows (among the largest in the world) have created a problem of plenty, resulting in a policy dilemma. Incessant capital inflows have put pressure on the appreciation of the yuan, something the government is reluctant to allow for fear of hurting exports.

Figure 3: External Balance

![Diagram showing the external balance of the PRC and India from 1980 to 2006. The PRC's current account balance surged upward, recording an exceptionally high surplus of 9.4% of GDP in 2006. India's current account deteriorated from about –1% of GDP to below –2% during the 1980s. Despite the improvement, India has not gotten rid of a balance of payment constraint on its growth like the PRC (Chapter 2). Source: World Development Indicators Online.]
Exchange rate. From Figure 4, it is evident that there has been a clear difference in the two currencies’ nominal exchange rate movement. India’s rupee has traced a consistent downward trend for a good part of the past 2 decades, and the pace of its depreciation accelerated in the post-reform period. It has depreciated by 82% from 22.7 rupees per US dollar in 1991 to 41.4 rupees in 2007. The yuan’s nominal rate depreciated 43% from 5.32 yuan per US dollar to 7.61 yuan over the same period. It depreciated constantly until 1993, following a similar pattern to the rupee. It then depreciated sharply (by 50%) to 8.62 yuan in 1994, and then remained virtually fixed at 8.3 yuan for the following 10 years. After a new, more flexible exchange regime was adopted in July 2005 under mounting pressure from major trading partners, it appreciated by about 8% to 7.61 yuan in 2007.

Figure 5 depicts the movement of the real exchange rates (adjusted by consumer price indexes). For both currencies, the real exchange rate vis-à-vis the US dollar depreciated quickly between the mid-1980s and mid-1990s, providing a sustained boost to exports. This corresponded to a period of sharp improvement in the current account balance in the PRC (Figure 3). The real exchange rate of the rupee depreciated much faster than the yuan in the first half of the 1990s, which is consistent with India going through a balance of payments crisis in 1991. The gap between the two currencies’ real exchange rates was maintained until the early 2000s when it began to narrow gradually as the rupee appreciated in real terms.

(v) Double-digit economic growth in the PRC has resulted in close to 300 million people being lifted out of absolute poverty over 3 decades. However, the rise in income inequality—especially between urban and rural areas—is posing a serious challenge to PRC policy makers.

17 Based on World Bank statistics.
Poverty reduction. In both the PRC and India, the majority of the poor reside in rural areas, as in many other developing countries with similar per capita incomes. The reduction in national poverty is, therefore, closely linked to rural economic conditions. In the PRC, an acceleration in the trend annual growth rate in agriculture (from 2.5% during 1966–1977 to 4.6% during 1978–2002) coincided with a sharp drop in poverty incidence (from 33% of the population in 1978 to 3% in 2001 (using national poverty line)). It is notable, in particular, that the better part of this decline occurred in the first phase of reform (1978–1984) when the growth rate in agriculture jumped to 7.1% per year, and the poverty incidence was more than halved from 33% to 15%.

The incidence of poverty declined in India from 50% in the late 1970s to about 26% in 2000 (using national poverty line). However, the fastest reduction in poverty occurred between the late 1960s and the late 1980s. This overlaps with the period of the Green Revolution, when agricultural growth was boosted by the introduction of modern technologies and strong policy support. Ongoing reforms have so far bypassed agriculture, and the sector’s growth rate in the post-reform period has remained at around the same level as in the 1980s, if not slightly lower. Agrarian reform in the PRC—due to its comprehensive nature—had a stronger impact on poverty alleviation with a vast pool of surplus rural workers being absorbed by the expansion of nonfarm sectors. The fact that a similar process did not take place in India offers an important lesson.

Need to revisit agriculture. In recent years, however, the need to revisit agriculture and the rural economy has often been pointed out in the PRC in the context of widening rural–urban disparities and excessive dependence on investment and exports as sources of growth. To address these problems effectively, a new program of reforms backed by a coherent investment package will be necessary to revitalize the rural economy and enhance incomes of households, including the vast majority of the country’s poor who reside in rural areas. For rapid economic growth to be sustained in
the next decade, in India and the PRC, economic reforms must focus on urbanization and further reforms of the rural economy.

**Developing Physical Infrastructure: A Comparative Perspective on the Experience of the People’s Republic of China and India**

(i) *As far as financing of infrastructure is concerned, India needs to establish a better balance between user costs and subsidies, and find more creative ways to use SOEs to deliver services at modest financial rates of return but high economic rates of return.*

**User charges.** The optimal balance between user costs and subsidies varies depending on the public good content of the infrastructure concerned. It is rational that in the case of the power sector, for instance, user charges are set to cover both operating and capital costs, given a high degree of private good nature of power consumption. In the PRC, user charges are levied in most types of infrastructure, cost recovery is full in a number of infrastructure sectors, and budget subsidies are generally much lower than in India. An interesting question is how authorities in the PRC managed to obtain acceptance by the general public of full cost recovery user charges. An explanation would be that the public accepted significant increases in power tariffs and other utility charges because their money wages were also raised simultaneously. In the transition from state-controlled to market-based distribution of goods and services in the early phase of reforms, the traditional in-kind payment of wages had to be replaced by cash payment. The sudden increase in the money portion of wages must have veiled the real income effect of higher user charges.

(ii) *India needs administrative reform directed at improving the governance and decision-making framework. India will also need strong and independent regulators in the infrastructure space, especially as more private players become involved in the provision of infrastructure services.*

For instance, India needs to depoliticize tariff setting by relying on independent regulators. The need to strengthen regulators also applies to the PRC. In fact, the regulatory framework is generally even less developed in the PRC than in India as the participation of private sector in the infrastructure sector has so far been limited.

(iii) *The National Development and Reform Commission (NDRC) has played a vital role in the PRC’s effective planning and implementation of infrastructure projects. NDRC combines top-down guidance with troubleshooting, coordination, and clearing-house functions, which has greatly enhanced execution capacity. India should embrace an agency that provides oversight like NDRC.*

**Role of local governments.** Other institutions that have played effective one-stop window roles in the planning and implementation of infrastructure in the PRC are local governments. The combination of the countrywide NDRC and local government units has created a vast network of proactive and well-coordinated infrastructure agencies covering the country.
Lessons from the People’s Republic of China and India

(iii) India should learn from the PRC’s experience in neglecting environmental consequences of development policy. Given that India’s dependence on thermal power is likely to continue in the foreseeable future, India can be proactive in preempting some damage to the environment by investing in clean coal and other pollution-control technology. Alternative approaches, such as demand-side management and renewable energy generation, should be encouraged.

Environmental degradation. A great threat to the sustainability of economic growth in the two countries is environmental degradation. Their heavy dependence on coal—one of the most polluting fuels with high levels of carbon dioxide emissions—as the main source of power generation is a cause for concern. Severe environmental problems will occur unless concerted efforts are made to adopt cleaner and more efficient technologies in power generation and other key economic activities. It should be underscored that proper pricing of energy is a necessary condition for the success of demand management and the promotion of renewable sources of energy.

The People’s Republic of China’s Manufacturing Sector Since 1978: Implications for India

(i) Savings and investment rates in India have risen sharply over the past few years, reaching almost 35% of GDP. These rates—while still considerably lower than those in the PRC—need to be sustained and even increased. India could also learn from the PRC’s bottom-up approach to development, which would require a sharp increase in public investment in agriculture.

Investment in agriculture. As has been pointed out in other sections, this is a fundamental strategic initiative of the PRC that India needs to replicate if it is to accelerate growth in rural areas, generate demand for rural and urban industry, and enhance poverty reduction. The Government of India has recently begun to enhance investment in agriculture, particularly for irrigation. However, there is a lack of a coherent strategy that is backed up with investment programs to strengthen synergies between the farm and nonfarm sectors.

(ii) The small and medium-sized enterprise (SME) sector contributes significantly to both output and employment in the manufacturing sector in India. Unlike the PRC, where government policies explicitly encouraged firms to scale up, India’s SMEs have the incentive to remain small. In addition, SMEs struggle to gain access to credit and often must borrow in informal markets at a premium above commercial bank interest rates. As a result, several SMEs have remained undercapitalized and unable to obtain scale economies. A review of the currently restrictive implementation of the credit policy toward SMEs must be undertaken by the Reserve Bank of India to promote SME growth.

Role of SMEs. It is notable that India’s SMEs have inadequate access to credit despite the government’s priority sector lending policy, which requires that 8% of net bank credit and 20% of priority sector credit by all public sector banks be allocated to lending to the SME sector. Obviously, the implementation of the policy needs to be
improved. Perhaps even more fundamental is to remove the incentive to remain small. In past episodes of rapid industrialization in East Asia and elsewhere, SMEs played an important role in underpinning the dynamic efficiency of the industrial sector and beyond. SMEs were a major source of successful entrepreneurs and technical innovation as well as the employers of a majority of industrial workers. For sustained growth of industry, it is crucial to create a policy environment for SMEs to grow.

(iii) The PRC has successfully demonstrated how a responsive regulatory framework can alleviate problems faced by investors and spur investment. India’s regulatory maze is complex, and unraveling the knots is burdensome and time-consuming. The present structure of entry and exit laws has discouraged new businesses from entering. Several states in India have actively used information and communications technology (ICT) to alleviate these problems and have reported considerable success in reducing inefficiencies and delays. This could be extended to other parts of the country.

Freer entry and exit. It takes 35 days to start a business in India, compared with 6 days in Singapore. It takes 10 years to shut down a business in India, compared with 2.4 years in the PRC. ICT helps but cannot cut down such delays without concomitant liberalization of entry and exit policies.

(iv) Foreign direct investment (FDI) inflows to India are a fraction of the PRC’s, and the inflows to the manufacturing sector in particular reflect this difference. India’s high savings and investment rates (approximately 35% of GDP) may make it less dependent on foreign capital than other developing countries, but FDI could still contribute the qualitative edge through technology transfer, exposure to better management practices, and gaining entry to export markets. To obtain the qualitative benefits of FDI, India must invest heavily in infrastructure and introduce policies to encourage firms to ramp up their manufacturing capabilities and to benefit from the technology spillovers that potentially accompany FDI.

Benefits of foreign direct investment. India’s saving rate crossed 30% of GDP in 2005–2006. To realize the target growth rate of 9%–10% over the long run, India could benefit from FDI even as a source of additional financing. With the incremental capital output ratio (ICOR) of about 4.0 recorded recently (2000–2006), gross domestic investment of 35% would imply annual GDP growth rate of 8.8%. Besides, if the investment in infrastructure increases substantially as envisaged by the Eleventh Five Year Plan (2007–2012), the overall efficiency of domestic investment may decline over the medium term until the benefits of new infrastructure are reflected in the productivity of real sectors.

Furthermore, if India’s manufacturing sector is to be integrated more fully in the global value chain, significantly greater inflows of FDI are necessary. Despite its much higher level of domestic savings, the PRC has heavily relied on FDI for financing its factories and infrastructure since the early phase of reforms. This was partly to realize the qualitative benefits of FDI but also due to the weakness in financial intermediation within the country.

The target growth rate path in India’s Eleventh Five Year Plan (2007–2012) reflects a beginning growth rate of 9%, increasing to 10% by 2012.
India invests an estimated 3%–4% of its GDP in infrastructure (though this proportion has gone up recently) as opposed to 9% in the PRC. The poor quality of infrastructure in India adversely impacts manufacturing in several ways. However, the government seems determined to remedy the situation by way of legislative changes such as the Electricity Act (2003) and investments of the order of $500 billion in infrastructure during the 5-year plan period 2007–2012.19

PRC firms have moved up the technology and scale ladder by interacting with world-class firms through contract manufacturing. Developing strong dependable links with buyers and suppliers has yielded compounded benefits to PRC manufacturers in the form of reduced variability in quality and delivery, higher precision, and lower costs. Discussions with Indian manufacturers have revealed that they are wary of such arrangements due to a fear that buyers may suddenly cancel orders, rendering built-up capacity redundant. Greater integration into global supply chains could potentially minimize this risk, but further research on the specific set of strategies needed to accomplish this is necessary.

Technology transfer by global production networks. Vertical global production networks are characterized by exclusive, long-term relationships between the single lead firm and many other members. Member firms are given opportunities to climb the technology ladder within a network to more technologically sophisticated activities with higher value added. In contrast, contract manufacturing is arranged between a single contract manufacturer and multiple lead firms as main players. The contract manufacturer—generally a very large firm—undertakes not only simple standardized tasks (e.g., assembly) but various core tasks (e.g., product design, production of key components, and procurement), which used to be carried out by the lead firms. Thus, a contract manufacturer needs to have significant technological capability as well as production capacity. Contract manufacturers enjoy significant economies of scale as they are allowed to produce same types of products (e.g., laptop computers and portable telephones) for multiple global brands. In return for this advantage, the contract manufacturers agree that they will not start their own brands and become the lead firms’ competitors. Contract manufacturers have built their factories in low-cost locations, including the PRC and other Asian countries. Local firms are involved as joint-venture partners or subcontractors and are given access to large-scale and relatively stable markets, but tend to have more limited opportunity to move up the technological ladder in the value chain as compared with those involved in the traditional vertical networks.20

State-Owned Enterprise Reforms in the People’s Republic of China

SOE reform was carried out with larger product market reform, providing the foundation to tackle issues that arose while reforms were being enacted.

---

19 In India’s Eleventh Five Year Plan (2007–2012), the government indicated an intention to increase total investment in infrastructure from around 5% of GDP in 2006-2007 to 9% by the end of the plan period. The investment will total to about $500 billion for 5 years.

20 For contract manufacturers operating in the PRC, see Luthje (2004).
Synergies between SOE and market reforms. The main objective of SOE restructuring was to improve efficiency by enabling their managers to make decisions based on market signals. Broader market reform and trade liberalization also created product markets with flexible prices that reflected international prices. SOE and broad market reforms made the prices matter and right at the same time. SOE reform was also preceded by reforms in the agricultural sector, and initial reform of the industrial and external sectors. The positive outcome of these earlier reforms helped pave the way for the reform in this economically critical and politically sensitive area.

(ii) Modalities and pace of reforms differed widely, ranging from retention of strategic enterprises with the imposition of harder budget constraints, to outright privatization. Ownership change was vital to improved performance—privatized enterprises performed better than partially privatized firms or firms that remained under state ownership but with greater autonomy.

(iii) The SOE reform process was gradual both spatially and temporally. Enterprises in certain regions were privatized before others.

Effectiveness of experiments. The spatial gradualism has been an important success factor of reform in the PRC. Experiments in selected geographical areas were used before countrywide implementation of reforms. Successful pilot testing of reforms in selected areas with good socioeconomic conditions served as an effective platform for mobilizing support for their countrywide implementation.

(iv) There was considerable local involvement in the reform process. Enterprise ownership was transferred to provincial and local governments before any significant restructuring was enacted. This served three fundamental purposes: shared responsibility for ensuring the success of the reforms, imposing a more direct and binding constraint on local and provincial governments, and reduction of information asymmetries due to the involvement of local government officials who were more conversant with realities.

Decentralized implementation. The involvement of local governments was crucial in ensuring that the design of reforms reflected conditions on the ground and in minimizing grassroots resistance.

(v) SOE reform in the PRC was an overwhelming success. However, enterprise reform must continue, especially with regard to better corporate governance and social security.

Need for further reforms. In the area of enterprise reform, restructuring needs to be continued in two major areas: state-owned banks and other large SOEs. Some SOEs do not pay dividends to the government, an important corporate governance issue. It is also desirable to correct this irregularity for the effectiveness of macroeconomic management, particularly with respect to overheating investments. Last but not least, the restructuring of banks needs to occur with further reform of SOEs, as nonperforming loans of banks cannot be dealt with effectively unless directed lending to SOEs is ceased.
Segmentation and Unification in the People’s Republic of China’s Labor Market: Lessons for India

(i) India should emulate the PRC’s policies to generate rural nonfarm employment and encourage entrepreneurship in rural areas.

Surplus rural labor. The strategic decision made by the government to focus on the rural economy during the initial phase of reforms produced highly positive results in the areas that are critical for the entire reform process. These included the creation of the investment-growth cycle and acceleration in poverty reduction. Surplus rural labor was absorbed by TVEs and urban industries. The transfer of surplus rural labor to nonfarm activities was enabled by the high literacy rate among the rural population. Despite the hukou system, farmers did not have difficulty in relocating to townships to work in TVEs, as local authorities allowed flexible application and provided other assistance to migrant workers.

(ii) India should invest in improving the quality of capital stock.

Returns on investment. Infrastructure is an area that needs additional investment if India is to take fuller advantage of its abundant supply of labor force. The capital stock in industry tends to be excessively capital-intensive (compared with the country’s resource endowments), which is largely attributable to labor market rigidity. As discussed earlier, the gross domestic investment in India has, nonetheless, become more efficient than in the PRC in recent years, partly due to growing excess capacity in the latter’s industry.

(iii) India should reform public sector enterprises as vigorously as the PRC, keeping local conditions in mind.

(iv) India should design policies to encourage mass manufacturing.

Exploit comparative advantage. A major reason why India has lagged behind the PRC in mass manufacturing is because it has been unsuccessful in exploiting its comparative advantage in unskilled, labor-intensive goods. Trade data reveal that India does better in capital- and skilled labor-intensive products in world markets than in unskilled labor-intensive products. This pattern of trade limits India’s ability to penetrate world markets and to exploit its vast pool of unskilled labor. Domestic policy constraints—most notably very stringent labor markets and infrastructure bottlenecks—are behind this phenomenon (Panagariya 2007).

(v) India should reduce administrative and procedural costs associated with administrative labor laws.

Labor market liberalization. India’s labor market is characterized by a profound dichotomy—the organized sector offers workers excellent job security under a set of rigid laws, whereas workers in the unorganized sector have no regulatory protection. Liberalization must include making labor market provisions in the organized sector more flexible and extending protection to labor in the unorganized sector. More than
the statutory provisions in Chapter V-B of the Industrial Disputes Act, it is the proce-
dural and compliance costs associated with administrative labor law that are a prob-
lem, which the PRC has successfully reduced (Chapter 6).

(vi) The PRC’s exploitation of the labor cost advantage has not been based on de jure
implementation of the 1994/95 National Labor Law, but on the de facto devia-
tions from its provisions, through the hukou system applied to rural migrants.

Since the labor law does not apply to or is not enforced in the unorganized sector,
the question of why India has not reaped such a benefit remains. The answer lies in
the lack of physical infrastructure and absence of human capital skills (Chapter 6).

Development Experience of India

The PRC’s Institute of Public Policy Studies (IPPS) team carried out five studies on
India’s development experience, including an overview and sector studies on soft-
ware and ITESs, higher and professional education, the financial sector, and
entrepreneurship.

An Overview of India’s Growth and Development

Fiscal reforms. In both countries, the maintenance of macroeconomic stability over
the past decades—a commendable achievement—has provided crucial underpinning
for the accelerated growth. In India, since the late 1980s, improvement of fiscal defi-
cit has been at the top of the policy agenda in macroeconomic management, gaining
momentum after the Fiscal Responsibility and Budget Management Act (2003). The
combined fiscal deficit of the center and states was reduced from a peak value of
9.6% of GDP in 2001–2002 to 6.4% in 2006–2007. Despite progress, however, the
fiscal deficit is still too high for improving the quality of public spending and ensuring
the long-term sustainability of growth (Shah 2008).

Notable progress was also made in the qualitative aspects of fiscal operations.
The incentives and scope for off-budget activities have been removed by the adop-
tion of a unified accounting and auditing system, legislative oversight, treasury-based
transactions, and rule-based fiscal transfers. Fiscal transfers between the center and
states have been improved in both equity and efficiency.

In the PRC, major fiscal reform was undertaken in 1994, in which the tax–GDP
ratio (after reaching a minimum of about 11%) rebounded to almost 20%, and the
central government’s share of tax revenues increased from just above 20% to over
55%. The fiscal deficit has almost always been lower than 3.0% of GDP and less
than 1.5% in recent years. A major problem in the PRC’s fiscal operations, however,
is the dependence on extra-budgetary resources, particularly by local governments,
which is causing lack of transparency and accountability.21 While rule-based transfers
are beginning, regional disparities in fiscal spending are still very large, and the tax
sharing system tends to redistribute revenues in favor of rich localities, exacerbating
regional inequalities.

21 In 1998, the PRC’s Ministry of Finance estimated the size of extrabudgetary funds to be 8%–10% of
GDP. See Wong and Bird (2005).
(i) Structural reforms implemented by successive governments in India over the past 2 decades reduced government intervention and encouraged competition. The economy was transformed from an inward-looking to outward-looking one, which gave rise to globally competitive entrepreneurs.

**Political neutrality of reforms.** Market-oriented reform has been sustained despite multiple changes in the government since it was originally launched by the Congress Party in 1991. The evident political neutrality of the reforms was in large measure a result of transparent and participatory nature of their formulation.

(ii) India’s growth depended more on domestic demand compared to the export-driven growth of the PRC. Growth was initially driven by consumption but, more recently, has been driven by both consumption and investment.

**Domestic demand-driven growth.** India’s growth, which had depended predominantly on domestic consumption, has become more evenly dependent on consumption and investment as the rate of domestic investment increased from less than 24.5% of GDP in 2001 to 33.9% in 2006. In contrast, in the PRC, overheating concerned policy makers in the early 2000s as the economy continued to move toward a high-growth, high-investment, and high net-export structure, which appears to be unsustainable. The problem in PRC can be seen in a growth decomposition exercise. In India, the contribution to GDP growth by consumption, investment, and net export averaged 56.2%, 47.4%, and -3.6% during 2001–2007. In the PRC, the growth decomposition among these components was 37.6%, 54.4%, and 7.9% during 2000–2005.22

**Need to rebalance the growth.** The PRC’s large and rising external current account surplus has become a contentious political issue in the relationship with major trading partners, while the accumulation of foreign exchange reserves led to excess liquidity and a suboptimal allocation of resources in the domestic economy. Since 2003, the government has adopted a policy to rebalance the economy away from exports and capital-intensive industry toward domestic consumption. Nonetheless, the share of household consumption in GDP has continued to fall, while the share of capital formation and net exports increased (ADB 2008). In the context of the present global economic crisis, the PRC’s greater dependence on net exports may make it more vulnerable than India to the simultaneous slowdown in the United States and other industrial economies. In light of the above, the PRC’s large fiscal stimulus package (CNY4 trillion) to be implemented in 2009–2010 to cope with the impact of the global economic crisis should also be used as an opportunity to take concrete steps to re-balance the economy.

(iii) India’s development experience shows that an unconventional pattern of development is possible for developing countries.

**India’s model can be replicated.** The sector composition of India’s economy is similar to that of other developing countries with comparable per capita incomes (Table 1). Yet the country’s successful development of the information technology

---

22 The growth decomposition is drawn from Kumar (2009).
and information technology-enabled services (ITES) sectors constitutes a “leapfrogging” in economic development, as those sectors traditionally flourished only in high-income industrial economies. This was made possible by the information technology revolution, which effectively transformed the information technology and ITESs from non-tradable to tradable. To export ITESs such as accounting, legal, medical, pharmaceutical, and other services, internationally acceptable levels of professional skills in the respective areas as well as proficiency in English are requisite. The international market for these services is likely to continue to expand rapidly, given the growing shortages in skilled workers and rising wages in most developed countries. There is plenty of opportunity, therefore, for other developing countries to replicate the unconventional growth model India has pioneered.

The Experience of India’s Software and Information Technology-Enabled Service Industries

(i) As early as 1986, the Government of India issued a policy to encourage the development of the computer industry. Enterprises that export all of their software products have been exempted from income tax, and restrictions on computer imports have been relaxed.

(ii) The Government of India, to its credit, allowed greater autonomy to the information technology industry, as well as favorable customs duties and income tax policies. It also supported the financing requirements of the industry through favorable loans, specialized bank desks, and venture capital investment funds. In contrast, the PRC’s information technology industry is less developed because of limited access to the capital market, especially for SMEs.

Free from the Industrial Disputes Act. In terms of policy environment, it is perhaps most critical for the rapid development of the information technology and ITES industries that they are free from the stringent labor regulations under the act since they principally employ white-collar workers.

(iii) India has a large pool of information technology professionals, whereas the PRC still lacks information technology workers at both the high level (project managers) and low level (programmers). In India, the government provides strong support to information technology education, especially in key universities and colleges. India’s vocational education ensures that there will be enough capable programmers in the country.

English for information technology. Besides technical education, an important advantage for India’s information technology and ITES professionals is their proficiency in English. Not only because the largest number of computer software, textbooks, and professional articles on the subject are written in English, proficiency is essential for exporting services to the United States and other countries.
(iv) The government also supported the creation of export-oriented software technology parks that provide complete ICT infrastructure and favorable treatment on custom duties, income tax, bank credit, and excise taxes. These policies were also applied to foreign-funded companies inside the parks. The parks also helped create strong industry groups in the information technology sector.

Software technology parks and special economic zones. Software technology parks have played an important role in attracting FDI in information technology and ITES industries in India as have special economic zones to manufacturing in the PRC. While modern infrastructure and favorable tax treatment are both important attractions of these entities, the economies of agglomeration—created by the presence of clusters of firms in closely related activities—appear to have also been a key consideration for locating production facilities by lead firms of global production networks.

(v) Maintaining the highest internationally recognized quality of services is also given utmost importance in India. There are various information technology associations involved in shaping government policies toward the industry, like National Association of Software and Services Companies, which is one of the most prominent associations in India today. Most software companies have already set up quality-control departments.

(vi) Possibly one of the important factors to the success of India’s information technology industry is its stringent protection of intellectual property. In 1995, a new copyright law took effect, which approximates international practice. This has encouraged the United States and other international software manufacturers to invest in India.

Intellectual property protection. The importance of protection of intellectual property rights cannot be overemphasized for the development of the information technology industry and, for that matter, most other manufacturing industries, as the knowledge contents of their products have also grown rapidly. For instance, for global production networks, which are now the production platform of a majority of multinational corporations in the manufacturing sector, the efficiency in transfer of proprietary technologies from the lead firm to other members is a crucial factor determining their international competitiveness. Weakness in such protection, therefore, can be a major hindrance for local firms to participate in the networks.

(vii) The success of the information technology industry in India is a result of the strategic vision that identified the development opportunities in the sector, and the ability to seize such opportunities of both the government and private sector.

Pioneer’s advantage. India’s information technology firms initially focused on software development and expanded later into other ITES industries. Taking advantage of its pioneering position and its pool of technical resources, India has been able to seize high value-added niches in the global market.
Higher and Professional Education in India

(i) *India’s higher education has paid attention to quality and has produced world-class engineers and managers. The emphasis on mathematics and English has been obvious, as India’s best technical education is up-to-date and patterned on the Massachusetts Institute of Technology and other Western universities.*

**Massification and quality.** While a small number of India’s elite schools are rated as world-class, the quality drops sharply in its second-tier institutions. The major challenge of India’s higher education, like in many other DMCs, is how to maintain the quality of the top schools and to improve that of others while it is undergoing massification to meet the rapidly growing demand of economic development.

(ii) *The government’s financial support has been very important, and education has been subsidized up to an extent where students can afford to continue higher education.*

**Major strategic decisions.** The prioritization of higher education immediately after independence was a key strategic decision of the government, shaping the pattern of economic development in the past decades. Development of information technology and ITES industries and the emergence of world-class entrepreneurs owe significantly to that decision. The gross enrollment ratio of tertiary education was much higher in India (6.1%) than in the PRC (3.0%) in 1991, although the PRC caught up with India by 2002. On the other hand, primary and secondary education in India may have suffered from lack of resources. In 2000–2004, the literacy ratio among 15–24 years old was 76.4% in India, compared with 98.9% in the PRC.

(iii) *The role of private players is well recognized by the government, as government alone cannot meet a huge and rising demand for education in India. Many universities in India have collaborated with their foreign counterparts, and the government has also allowed FDI in the education sector.*

(iv) *In the future, as India has the world’s largest young population, the government may face challenges in providing educational infrastructure and other facilities.*

**Realizing demographic dividends.** Unlike in the PRC, the age composition of the population is projected to remain favorable for India in the next few decades. However, for India to benefit fully from the future demographic dividends and to achieve broad-based economic growth driven by both the industry and services sectors, a marked increase in investment in both basic and higher education will be necessary. The PRC is faced with the need to maintain its international competitiveness and growth momentum as the supply of young entrants to the labor force slows down. The PRC needs to strengthen higher education in engineering and in science and technology to support the industry’s shift to more technologically sophisticated lines of activities.

---

23 The enrollment ratios are from the World Bank (2000).
and to improve the quality of professional education to promote development of high value-added services.24

India’s Financial Sector Reform and Experience: Lessons for the People’s Republic of China

(i) The first phase of India’s financial sector reforms involved the liberalization of interest rates and directed credit in the early 1990s. The second phase is focusing on reducing fiscal pressures on the financial system; improving the banking system; improving the overall regulatory framework for credit and risk management and investor protection; developing capital markets; developing pension, insurance, and long-term investment markets; forging and managing links with external capital markets; and improving financial services provision for customer welfare.

Sequence in reforms. The decision of the government to push through with financial sector reforms during its initial phase was bold. In the aftermath of a major balance of payments crisis, the government’s paramount task was to correct macroeconomic imbalances, particularly the fiscal deficit. As the government had a large outstanding balance in domestic debts, an increase in the debt servicing cost—as a consequence of financial liberalization—would add to what was already a serious problem. The government’s decision to go ahead with the financial reform, regardless of the undesirable fiscal impact, has proved to be right and has paid off handsomely. This is in contrast with the PRC’s decision to delay financial reforms until after substantial progress was made in restructuring the real sector.

(ii) Despite a late start in the reform in the financial sector, India has more concrete road maps for its reform process, and has thus achieved much more in major sectors of its financial market than the PRC.

Difference in initial conditions. Though India may have begun the present reform program later than the PRC, it has a much longer history of modern financial institutions, some of which date back to the pre-war period. The existence of a strong private sector has also provided a nonfinancial foundation for the development of India’s financial sector (Patnak 2008). In the PRC, SOEs remained almost the sole beneficiaries of the financial sector until a decade ago. At the end of 1999, the private sector accounted for only 1% of bank lending, and only 1% of the companies listed in the Shanghai and Shenzhen stock exchanges were non-state firms (Gregory and Tenev 2001). The performance of the PRC’s financial sector is directly affected by the progress in restructuring SOEs. In comparing the speed at which financial sector reforms were implemented in the two countries—and the performance of the sector in the post-reform period—the differences in initial conditions should be duly taken into account.

(iii) The most noticeable sector of India’s financial market is the stock market, which essentially has all major equity products trading. The futures and options instru-

---

24 For labor market transition in the PRC, see ADB (2008).
ments have provided necessary tools for market participants to hedge their risks, thus facilitating stock market development. In the PRC, however, neither equity futures nor options yet exist despite years of preparation. The PRC has a lot to learn from India in equity products design, regulation, risk management, and supervision of foreign capital inflow into the stock market.

**Shifting away from the banks.** After extensive reforms, India’s equity market is now much more developed in relative terms than the banking sector or bond market. This is distinct from the PRC and other East Asian countries where banks are predominant in the financial sector. The development of the equity market has contributed to the improvement of corporate governance and thus encouraged investment by domestic and foreign minority shareholders (Lane and Schmukler 2007).

(iv) India’s foreign exchange market is also much more developed than that of the PRC. Specifically, India’s foreign exchange spot trading and forward trading have reached international levels, although the foreign exchange swap market is still underdeveloped. India’s foreign exchange derivatives are also well developed. However, in the PRC, foreign exchange spot, forward, and foreign exchange derivatives are still far behind corresponding international levels.

(v) Central government securities have grown steadily in both India and the PRC, with REPO transactions being more active than corresponding outright transactions in both countries.25

(vi) The corporate debt market is not well developed in either country, but India’s is more developed than the PRC’s. The Reserve Bank of India began to promote interest rate derivatives as early as July 1999, about 7 years earlier than the People’s Bank of China.

(vii) India’s central bank, the Reserve Bank of India, is not formally independent from the government. However, it has considerable operational autonomy.

(viii) India’s banking system continues to be dominated by government banks, as they account for three-quarters of total commercial banking assets. The banking system, however, is fragmented; with the exception of the State Bank of India, no one bank holds more than 10% of total system assets. The government recently announced an intention to reduce its legislated minimum shareholding in public sector banks to 33% from 51%.

**Dominance of state-owned banks.** The banking sector in the PRC consists of state-owned banks, joint-stock banks, city commercial banks, and credit cooperatives. Four state-owned commercial banks account for 61% of loans (Ping 2003). Privatization of the state-owned banks is a key challenge for future financial sector reform in both countries.

---

25 REPO (i.e., repurchase agreement) is used by a central bank to give banks and other financial institutions extra liquidity by buying government securities for a short period, with the borrowers agreeing to repurchase at a stated price.
(ix) Domestic and foreign banks are required to provide 40% and 32%, respectively, of their net bank credit to the priority sector, which includes women, SMEs, agriculture, and education.

(x) India’s banking sector has more fully utilized the advantages of latest technology available (e.g., software service packages) and competes well with its foreign counterparts.

(xi) Public insurance companies provide subsidized insurance and, in return, benefit from lower corporate taxation.

Outstanding Entrepreneurs in India

(i) Wealth is not the only motivation for India’s entrepreneurs to become involved in business. It is also their desire to excel in their field of business and to create opportunities for others.

(ii) India’s entrepreneurs attach the utmost importance to innovation. They are good at identifying and seizing new opportunities.

(iii) All successful major enterprises in India give priority to the training of employees and providing them with opportunities for promotion. There are many family-owned businesses that are run by professional managers who are not family members.

(iv) India’s companies feature a combination of family values and Western management, and most have shifted to a modern enterprise system in the last decade. This can be attributed, in part, to the revised Corporation Law implemented in 2000 that adheres to international standards and practices.

(v) Many of India’s companies are listed in the domestic and foreign stock markets and have gained the trust of domestic and foreign investors, thanks to their excellent record of corporate governance.

Corporate governance. India’s large companies with international exposures are considered to be better governed than their counterparts in the PRC. A well-functioning equity market and vibrant and credible business media are cited as important contributing factors behind the good performance of corporate governance in India (Holstein 2008).26

(vi) Large enterprises in India are marked by a strong global strategy. They compete in international markets, and use mergers and acquisitions to grow and to strengthen research and development.

---

26 In an international rating of corporate governance in 2005, India and the PRC were ranked third and ninth, respectively, among 11 Asian countries (CLSA 2007).
Global strategy. Internationally competitive firms in the PRC undertake FDI to mitigate trade frictions and establish sales networks. SOEs, on the other hand, tend to make FDI, often in the form of mergers and acquisitions, to acquire new technologies and natural resources as well as to access foreign markets. These strategic overseas operations are often constrained by a shortage in human resources with adequate international experience.

(vii) The auspicious combination of the 1991 economic reforms, existing pool of human and physical resources, opportunities provided by the global market, and entrepreneurial spirit have led to the rise of large, globally competitive private enterprises in India.

Financial sector and development of entrepreneurs. Entrepreneurs grow with their enterprises. Financial sector reform and consequent development of the financial sector, particularly the capital market, markedly improved access for a new generation of India’s entrepreneurs to finance the start-up or expansion of companies. A government policy that allows public sector financial institutions to provide loans to new enterprises at preferential terms has played a significant role in nurturing local entrepreneurs.27

Conclusions

The outstanding economic performance of the PRC and India is due to the large size of their domestic markets, demographic dividends, information technology revolution, and proliferation of global production networks in the manufacturing and services sectors. More so, however, it has been due to a cumulative impact of ongoing market-oriented reform programs, which both countries have formulated and implemented without major disruption over the past few decades. A variety of factors have brought about differences in the two countries’ performance in terms of overall economic growth, macroeconomic stability, poverty reduction, and environmental protection during the post-reform period. These factors include initial conditions, sequencing and pace of reforms, political and administrative systems, and legal and judiciary institutions. However, a number of lessons to learn and policy recommendations have emerged from the 10 studies on the two countries’ development experiences.

Rapid economic growth often aggravates disparities among areas or segments of a developing economy, and neither the PRC nor India has been able to escape this problem. The post-reform pattern of growth has not been particularly pro-poor or equitable in either country. In the PRC, growth in the primary sector (primarily agriculture) contributed more to reduce poverty and inequality than growth in the secondary or tertiary sectors. As industrial growth gained momentum in the mid-1990s, income disparities—particularly those between rural and urban areas—began to increase. In India, with higher initial inequality in access to land and education as well as the

27 The Industrial Credit and Investment Corporation of India and the Industrial Development Bank of India, which were created by the government in 1955 and 1964, respectively, performed such function.
Lessons from the People’s Republic of China and India

exclusion of agriculture from ongoing reforms have led to slower progress in poverty reduction. In both countries, there has been a marked geographic unevenness in economic development, with a number of lagging regions.

The limited natural resources base is a critical constraint to growth in both countries. The future growth prospects for the PRC and India will depend on the availability of imported energy, for which uncertainty is increasing. Both countries are also among the most severely affected by water shortages. To sustain rapid growth, the PRC and India will need to invest in new technologies to harness energy and water, and optimize their economic structure for greater efficiency in the use and preservation of natural resources and the environment. The greatest challenge for the long-term economic growth of Asia is environmental degradation. Rapid economic growth of Asia and the Pacific—led by the PRC and India—with concomitant increase in the incomes of half of humanity, could cause environmental problems of a global dimension unless concerted efforts are made to adopt less carbon-dependent and cleaner technologies in power generation and other key economic activities.
References


The desire of the People’s Republic of China (PRC) for a high, sustainable rate of growth has been realized through coherent, phased economic reforms. These reforms are notable for their gradualism,2 adaptability in the short term, flexibility in the long term, and policy makers’ willingness to experiment before deciding on their final structure. They have been consistently deepened where they have succeeded, and widened to tackle new challenges that have arisen. Every stage of reform was aimed at maintaining a low rate of inflation and a manageable balance of payments position. Such phased gradualism contrasts with the views of many policy analysts who recommended a “big bang” approach to reforms, which has been adopted by several transition economies.

**Phasing of Economic Reform**

Reforms in the PRC have affected all spheres of economic activity in a phased manner. In the first phase, reforms began with the introduction of incentives in the agricultural sector, where they succeeded in raising productivity and output. They were then extended to the manufacturing sector, which absorbed the labor that was freed from agriculture. Manufacturing growth was also supported by fiscal changes, which gave more resources to local governments to meet local infrastructure needs. Rules for inflow of foreign investment were liberalized. Foreign investment was directed toward export production—particularly through the establishment of special economic zones (SEZs). Inflows of foreign direct investment (FDI) and the subsequent increase in exports prevented the emergence of balance of payments constraint. In the second phase, reforms were extended to prices to provide better market signals to enterprises.

---

1 Senior visiting fellow, Centre for International Governance Innovation in Waterloo, Ontario, Canada (e-mail: magarwal@cigionline.org). The author wishes to thank the participants of various workshops for their helpful comments and suggestions as well as an anonymous reviewer of an earlier draft. Remaining problems are his responsibility.

2 For instance, experimental reforms were introduced in 1978 in rural areas and enterprise governance, which were gradually extended. While the experiments were considered successful before their scope was expanded, the speed of expansion raises doubts about serious evaluation. Another instance is the introduction of the director responsibility system in Dalian in 1986 before being extended to 36,000 enterprises by the end of 1987.
Reforms were then begun in the foreign trade regime to align domestic prices with international prices by bringing down trade barriers and opening up the foreign trade sector.

However, at the end of the 1980s, these reforms resulted in a substantial macro imbalance and a high rate of inflation. The government immediately sought to rein in the increasing fiscal imbalance by lessening the dependence of public enterprises and foreign trade companies on subsidies from the budget. Increasingly, they had to depend on banks to finance their activities, thus passing on the imbalance to the financial system. Therefore, in the next phase of reforms, fiscal and monetary reforms were emphasized to manage the macro economy. These reforms reduced the rate of inflation, which remained low. They also channeled increasing household savings to productive purposes. The latest phase of reforms plans to tackle the imbalances, regional disparities, skewed personal income distribution, and environmental problems that the 20-year high growth rate spurred.

**Impact of the Reforms**

The phased reforms in the PRC have been spectacularly successful in generating high rates of growth for an extended period with relative price stability, in contrast to the experience of many other transition economies. The policy of liberalizing foreign trade, that is, reducing quantitative restrictions and lowering tariffs, has also substantially integrated the PRC’s economy with that of the world.

Since 1979, when the reforms began, the PRC’s economy has grown at an annual average of about 10% (Bosworth and Collins 2007). The PRC’s high economic growth rate has resulted in an impressive decrease in the poverty rate, but personal income distribution has worsened and regional disparities increased. While it cannot be disputed that the PRC has gradually performed better in the provision of social services, the extent of this improvement is questionable. Many also believe that access to health services has deteriorated. However, whenever the rate of inflation has increased, the government has initiated steps to rein it in. Despite brief episodes of high inflation rates, the rate has been low, particularly since the reforms of the mid-1990s. The PRC’s shares of world exports and imports in 2004 were 5.7% and

---

3 The reduction of subsidies was also aimed at hardening the budget constraint faced by these entities so that they would align their activities with market realities.
4 Many other transition economies, including some that adopted a “big-bang approach” to reforms, experienced varying periods of decline in economic activity.
5 The calculated growth rate varies depending on whether one uses official figures or makes some corrections, although the difference is not great. The sources of growth for India and the PRC are also analyzed.
6 Friedman and Gilley (2005) argue that there is not a great difference in the growth in human development index between the PRC and India and that the difference has tended to narrow since India started its reforms. See World Bank (2006) for the PRC’s performance in the different indicators of the Millennium Development Goals.
7 The reform results have been quite different in India. Although poverty continued to decline after the reforms, the rate of decline has slackened. It is unclear whether this phenomenon is due to the reforms or because it is more difficult to pull the remaining population out of poverty. Also, there is no evidence of substantial worsening of income distribution in India.
4.8%, respectively, and were larger than its share of world income, a phenomenon that is rare among large countries, and points to the success of the policy of trade liberalization (Winters and Yusuf 2007).  

**Fiscal Reforms**

Under the old planned economy system, enterprises had no incentive to improve the efficiency of resource use. Public enterprise surpluses were transferred to the central government, and the central government transferred a portion of these to provincial governments, according to expenditure needs approved by the central government. Provincial governments, in turn, passed on some funds to lower levels of government. Reforms, therefore, had to improve incentives and to align them along market lines to improve overall efficiency. Reforms were also geared toward decentralization of economic management to give greater autonomy to provinces and state-owned enterprises (SOEs) and to lay the groundwork for private enterprises. The reforms focused on three areas: (i) direct enterprise taxation, (ii) indirect taxation, and (iii) center–province relations (Bahl and Wallich 1992).

**Initial Reforms: Increased Decentralization**

In 1980, the centralized system was replaced by a revenue-sharing system, in which central, fixed-tax revenue accrued to the central government; local, fixed-tax revenue accrued to localities; and shared revenues were distributed among different branches of the government. Reforms, focused on revenue and responsibility sharing between the central and provincial governments, attempted to match resources available to local governments with their responsibilities—as local governments are better able to gauge local needs—and to enable the central government to manage the macro economy as well as to equalize the availability of resources between poor and richer provinces (Ma 1995). Later, a further objective was added to help those who had become worse off because of the reforms.

Tax rates were determined by the central government, although taxes were collected at the local level. Initially, there was a uniform sharing formula between the central government and provincial governments. However, this translated to surpluses in the richer provinces and deficits in the poorer provinces. In 1985, the State Council redesigned the system by setting varying levels of sharing depending on a province's performance in previous years, i.e., poorer provinces were allowed to retain a larger share of the taxes collected. The system was further altered in 1988 to allow provinces a larger share of tax revenues partly because of the need for larger investments in infrastructure needed by the growth in the economy.

As a consequence of the reforms, the share of tax revenues to gross domestic product (GDP) declined sharply, from about 34% in 1978 to 17% in 1992. The central government’s share declined from 51% to 41%. Although strict control of expenditures meant that overall deficit remained small, there was a mismatch between

---

8 The PRC's share of trade in manufacturing is even larger: 7.7% for exports and 6.2% for imports.
9 There are five tiers of government in the PRC.
central government expenditures and revenues, which resulted in deficits as large as about 6% of gross national product in the mid-1980s. This large deficit contributed to the high rates of inflation during the late 1980s.\textsuperscript{10}

\textbf{Reforms in Enterprise Taxation}

Reforms in enterprise taxation began with a few factories in Sichuan Province being granted greater autonomy, which included not surrendering all their profits, culminating in a national experiment promulgated in July 1979 (Byrd 1992). Enterprises were allowed to retain 10\%–30\% of above-quota profits. The system was expanded rapidly, and by the end of 1980, 6,600 firms were covered by it. Both quota profits and retention rates were negotiated, which—while lending considerable flexibility to the system to deal with unexpected developments—also weakened incentives. Also, since profits depended on exogenous factors such as the price for the product fixed by the government, incentives were further diluted. The adverse effect on central government revenues was also unwelcome, both in terms of amount and certainty.

A profit tax system was instituted between 1983 and 1985, although experiments with different forms of the system had been occurring since 1980. Under the system prevailing at that time, the profits of an enterprise were not always due to its efficiency but to prices that were still controlled. Thus, the profit tax was supplemented by an enterprise adjustment tax, which was negotiated (Bahl and Wallich 1992). The difficulties in managing this profit tax system were motivating factors behind the substantial price reform in 1984 and its rapid spread thereafter.\textsuperscript{11} A system of revenue sharing was introduced in 1985–1986, and a system of tax contracting was gradually introduced in 1987–1989. By the end of the 1980s, about 90\% of SOEs were under a tax contracting system (Bahl and Wallich 1992), under which the discretionary element assumed increasing importance. Tax liability was also negotiated on a case-by-case basis, creating problems of horizontal equity. Furthermore, to provide an incentive to SOEs, the marginal rates under the system were kept very low so that the elasticity of the enterprise tax was less than unity. This significantly affected overall elasticity, which was 0.6 for total tax revenues, only 0.4 for local government revenues, and 1.0 for the central government (ADB 2005).

Although the central government determined the rates of taxation, the provincial and local governments had considerable discretion in granting tax relief. A provincial government could grant a tax holiday to stimulate output of a new product or a pioneer enterprise. Tax bureaus could also negotiate taxes at lower rates and grant ad hoc relief to enterprises. These elements of discretion were used widely to stimulate economic development in local areas at the expense of tax revenues.

However, the change from profit retention system to profit tax system and then to the contracting system failed to stem the problems of declining tax–GDP ratios, declining central government share in tax revenues, and large deficits. The system also

\textsuperscript{10} Price liberalization—undertaken to equalize the playing field between different enterprises as far as their profits were concerned—also contributed to the inflation.

\textsuperscript{11} The number of industrial products subject to mandatory pricing declined from 256 to 23 in 1986. The proportion of mandatorily allocated quantity of output in 1986 was 42\% for coal, 53\% for steel, 30\% for timber, and 16\% for cement (Byrd 1992). The proportion of retail sales subject to mandatory prices in total retail sales fell from 97\% in 1979 to 47\% in 1986.
resulted in a pro-cyclical fiscal policy; SOEs wished to invest in periods of high aggregate demand, and local governments sought to meet their demands for infrastructure, resulting in less revenue being transferred to the central government. Since marginal rates were low, more resources also remained with SOEs at the time of high demand either to be paid out as wages or reinvested. As contracts were fixed for a period of time, the government’s ability to introduce new taxes in a timely manner was reduced. Rates of inflation increased substantially in some years.

Commodity taxation also became more important because, without price reforms, some profits were due to arbitrarily fixed prices. Commodity taxes were used to offset the inequities introduced by distorted prices. This resulted in a very large number—over 260—of tax rates. In 1994, a value-added tax (VAT) was introduced, and gradually replaced the cascading sales tax. However, because the VAT was origin-based, it discriminated in favor of richer provinces, which had the necessary production facilities.

Reforms to Improve Central Government Economic Management

In keeping with its philosophy of gradualism and pragmatism, the government first experimented with further fiscal reform in nine cities before comprehensive reforms were introduced in 1994. Taxes continued to be divided into central, provincial, and shared taxes. The central government set up its own tax collection agency, responsible for collecting both central and shared taxes (Ma 1995). The objective was for the central government to collect 60% of total revenues; two-thirds of this would cover its own expenditures, and the remaining one-third would be transferred to the provinces.

The tax reform provided a uniform tax rate for all large and medium SOEs, which was lower than the earlier tax rate. Revenues from the profit tax continued, even after the reforms, to accrue to the level of government that owned the enterprise. This feature had an unwelcome consequence—it encouraged localities to set up their own SOEs, regardless of economies of scale or comparative advantage.

The number of commodities covered by the VAT was also expanded, and a sales tax was levied on all firms in the service sector. While the origin-based VAT was an improvement over the cascading sales tax, it was regressive. However, the salary tax was progressive, increasing from 5% to 45%, with Chinese and non-Chinese being taxed at the same rates.

Another major feature of this reform was grandfathering to protect the interest of the provinces, particularly the weaker ones, and to decrease opposition from vested interests. A province’s retained revenues in 1993 were used to calculate central transfers, so its revenues would not decline under the new system. The central government would then increase its revenues only from amplified shared revenues, mainly the VAT. Also, the central government promised not to shift any new expenditure responsibilities to the localities.

The 1994 reforms were successful in reversing the declining trend of the tax–GDP ratio and share of central government. The tax–GDP ratio, after reaching a minimum of about 11%, rebounded to almost 20%. The central government’s share of tax revenues increased from just above 20% to over 55%. The elasticity of total tax

---

12 India has done something similar to overcome the opposition of some states to the introduction of the VAT. India’s states introduced VAT on 1 April 2005.
revenues increased from 0.6 for 1979–1993 to 1.9 for 1994–2003; the elasticity for central government revenues increased from 1.0 to 2.1, and for local governments from 0.4 to 1.8 (ADB 2005). These elasticities suggest that government revenues will increase faster than they had in the past.

Local Government Financing: Remaining Problems

The expenditure responsibilities of the local governments, however, were considerably more than in most other countries. Local governments accounted for over 60% of government expenditure and were responsible for the bulk of social services (including health and education), and infrastructure. Although the 1994 reforms recentralized revenues, they did not restructure expenditure responsibilities (Rao 2003). The central government, however, committed not to pass any further expenditure responsibilities to local governments, which had more expenditure responsibilities than revenues.

Local governments had little formal or legal independence in structuring their tax systems or deciding on the level and composition of their expenditures. Transfers from the central government were essential to enable local governments to meet their expenditure responsibilities, which were greater than their revenues. Central transfers accounted for almost 50% of local expenditures and were 70% of central revenues (ADB 2005). Although rule-based transfers began, they still had a large ad hoc element and created an environment of uncertainty for local governments. Also, they tended to discriminate against the poorer provinces. The transfers were not commensurate with responsibilities, even though 1993 revenue levels were protected, and provinces did share in the increase in revenues. However, this did not seem to have fully compensated the provinces for losing taxes on rapidly increasing bases. Therefore, local governments had to either depend on extrabudgetary sources of revenues or underprovide services (Rao 2003).

Regional disparities in fiscal spending were very large, and the tax sharing system tended to redistribute revenues in favor of rich localities, exacerbating regional inequalities (World Bank 2002). Local governments have recently started to deal with dependence on extrabudgetary resources, which have been growing very rapidly and creating problems of lack of transparency and accountability (World Bank 2002). Most fees and surcharges of the central government have been brought back into the budget, and extrabudgetary funds are only a small part of total revenues. However, they still remain significant for local governments, though their importance is declining (ADB 2005).

Foreign Trade Regime

The policy of promoting trade to develop the PRC economy has been the lynchpin of the reforms and has met with remarkable success. Exports grew at over 12% a year in the 1980s, a rate surpassed by few countries (World Bank 1994). PRC exports surged particularly in the mid-1980s, growing from $43.6 billion in 1983 to almost $70.0 billion in 1985, and to $150.0 billion in 1992.13 The share of exports in its GDP increased from about 10% in 1978 to over 30% by the late 1980s.

---

13 Exports continued their impressive performance, growing at an annual average rate of over 15% between 1995 and 2004.
Major trade reforms were implemented in the late 1970s, 1988, and 1991. The later reforms enhanced the role of the market and sought to reduce the burden of subsidies on the budget. More institutional competition through increased entry of companies engaged in exports, depreciation of the exchange rate, foreign direct investment (FDI) (mainly from Hong Kong, China), and duty-free access to imports for assembly into exports all contributed to this remarkable performance.14

Under the old planned economy system, exports were considered unimportant and were viewed as a means to pay for needed imports (Panagariya 1991), an attitude similar to that of policy makers in India. Trade was centrally planned under the then Ministry of Foreign Trade and Economic Cooperation, channeled through foreign trade companies (FTCs), which were organized by product and had branches in major provinces. FTCs purchased exports in the domestic market, and the prices at which they sold imports in the domestic market were fixed by the government to meet its planned objectives. The government also financed the losses of these companies.

Reforms relied heavily on production for export by foreign investment enterprises (FIEs), and also gradually increased the role of the market. In 1979, the government enacted the Law on Joint Ventures using Chinese and Foreign Investment, which permitted foreign investment. Four SEZs were established in 1980–1981. In 1984, 14 coastal cities and the island of Hainan were opened to foreign investment.

The FTC rules of operation were also changed. Initially, while planned quantities of exports and imports were dealt with by FTCs at planned prices, amounts above this could be procured domestically at market-determined prices and exported. Also, the number of FTCs hugely increased from 12 in 1978 to about 3,500 in the early 1990s as provinces and ministries set up their own FTCs and branches were converted into independent FTCs. In September 1984, the government approved further changes based on an expert committee’s recommendations. FTCs were made independent and given autonomy in their day-to-day operations. However, the loosening of government control resulted in a sharp increase in the trade deficit, so controls were temporarily reinstated (Panagariya 1991).

The trading system moved from explicit targets for FTCs to FTCs being allowed to export extra amounts, then to a contract system where the targets for values of trade were negotiated with FTCs (although over-target exports were allowed). Negotiations also gradually took more of a “bottom-up” rather than a “top-down” approach. Each province’s contractually determined target was disaggregated and assigned as targets to various FTCs. Since FTCs were not entirely free to choose which goods they could export—and subsidies were gradually phased out—FTCs’ losses were financed by loans from state banks, resulting in a large increase in bad debts.

**Changes in the Framework of Trade Policy**

Exports were initially divided into two categories: the command plan and the guidance plan. The command plan was mandatory, with fixed quantitative targets applied to specific products. The guidance plan had value targets for provincial governments, which also had considerable flexibility in deciding how to meet the targets. Goods under the command plan were divided into products that were handled by a few selected

---

14 This is in contrast with India, where the major factor creating an incentive for exports has been the exchange rate.
national FTCs and those that could be handled by a wider range, including provincial and local FTCs. For the guidance plan, prices could be fixed, floating, or free market, depending on how each province decided to meet its value targets and the negotiating position of producing firms vis-à-vis the FTCs.

Imports were divided into three categories—a mandatory plan for essential raw materials, a system of foreign exchange allocation for imported raw materials and spare parts for key national projects, and an import licensing system. All procurement for imports under the mandatory plan was at fixed prices. Since importers of nonmandatory goods were free to choose their FTCs, prices played a more important role for nonmandatory imports. FTCs’ losses were covered by the budget, amounting to as much as 2% of GDP in the mid-1980s—larger than the budget deficit.

The 1988 reforms introduced a system of contracts for exports with every provincial administrative unit and all specialized FTCs. These contracts were for 3 years and specified the amount of foreign exchange earnings, amount of foreign exchange to be handed over to the central government, and amount of subsidy from the central government. The number of category 1 products subject to mandatory planning was reduced from about 40 to about 20, and the number of category 2 products was reduced from about 120 to 90. The 1991 reforms eliminated mandatory planning, but the state retained some control through canalization and licensing. About 15% of exports were in category 1 or 2. The period of the contract was changed to annually, and the targets became more bottom-up. The import plan was also scaled down as the number of products under category 1 and 2 were reduced, accounting for less than 20% of imports. It also eliminated subsidies.

Maintaining good quality has been an important part of the PRC’s export strategy. At the end of the 1980s, the PRC took steps to monitor the quality of its exports. The Commodity Inspection Law, passed in 1989, called for inspection of all export products on an official list. In 1990, almost two-thirds of the PRC’s exports of manufactured goods—1.5 million shipments—were reportedly inspected. The State Administration for Import and Export Commodity Inspection conducts the inspections and has greatly expanded its capacity to do so. It has also been involved in technical assistance and training for local manufacturers. Local firms have been encouraged to seek certification from accredited foreign laboratories. Other government agencies are also involved in improving quality. However, the recent scandals regarding the safety of some consumer products suggest that the system needs strengthening.

Reform of the Tariff and Import Control System

Over time, the trading system has been liberalized as the quantitative restrictions on exports and imports, and the tariffs on imports have been reduced. The unweighted average of tariffs in 1991 was about 40%, almost the same as India’s average after reforms in 1991. The actual tariffs in the PRC were lower, and there were substantial amounts of duty-free imports of raw materials for processing into exports. In fact, over 50% of the PRC’s trade is based on processing (WTO 2006). As part of its accession agreement to the World Trade Organization, the PRC bound all its tariffs, practically all of which were ad valorem. The average tariff rate fell from 15.6% in 2001 (just before accession) to 9.7% in 2005, which was lower than its commitment in the accession agreement. The average tariff was 15.3% for agricultural products and 8.8% for nonagricultural. As tariff levels were reduced, the dispersion remained fixed at
about 0.8, but as expected, the standard deviation declined. Because there were over 74 separate rates, the level of tariff escalation was limited. There was also negative escalation between unprocessed and semi-processed goods (WTO 2006).\(^\text{15}\) Imports were relatively free of restrictions, except for safety reasons. Only about 6.5% of tariff lines are subject to import prohibitions (4% are totally prohibited). Export controls are used to regulate the domestic supply of essential commodities.

**Outcome of the Reforms**

Estimates suggest that almost two-thirds of PRC exports in the early 1990s were based on processing of duty-free imports. Another important feature has been the role of SEZs and of FIEs located there. Outward FDI became more important and was geared toward the import side of trade. Outward FDI increased from about $1 billion in 2000 to $11 billion in 2005 (RISDC 2007), and most of it was in natural resources sectors (Broadman 2007; RISDC 2007).\(^\text{16}\) Maintaining a competitive exchange rate was also important; the exchange rate depreciated by almost 100% in the late 1980s.

PRC exports were gradually allowed to grow along the lines of their comparative advantage as the role of planning was gradually reduced. Manufacturing accounted for about 80% of exports in the 1980s, and labor-intensive goods were about two-thirds of manufactured exports. However, a significant change occurred in recent years in the PRC’s export basket. The share of textiles and clothing decreased from 26.7% in 1998 to 17.6% in 2005 (RISDC 2007). Exports of high-technology products, e.g., machinery, transport equipment, and telecommunication equipment, now account for nearly one-half of the PRC’s exports as they have increased fivefold in the last 7 years (Devlin, Estevadeordal, and Rodriguez–Clare 2006; RISDC 2007).\(^\text{17}\) A striking feature on the import side is the rapid increase in imports of raw material.

**Foreign Exchange Regime**

The foreign exchange regime has also changed substantially. From 1981 to 1984, there was a dual—official and secondary—exchange rate system. The official rate depreciated while the secondary was fixed, so the gap narrowed and was ultimately eliminated in 1985.\(^\text{18}\) However, dual rates reemerged in 1986 with the establishment of foreign exchange adjustment or swap centers. Officially, the PRC had a managed floating rate since 1994 when the official rate was devalued and multiple rates abolished. However, after a mild appreciation in 1994–1997, the currency was de facto fixed to the United States (US) dollar until July 2005, and the daily variation was

\(^\text{15}\) In contrast, the average tariff rate is higher in India, and it has more dispersion. There are fewer rates. Also, in general, there is limited tariff escalation in India’s tariff structure.

\(^\text{16}\) India’s FDI abroad seems to be different. It appears to be geared toward acquiring technological capability, brand value, or export markets.

\(^\text{17}\) Some analysts argue that only last-stage assembly, which is labor-intensive and not skill-intensive, is carried out in the PRC. However, it must also be noted that expenditures on research and development as percent of GDP have doubled from 0.6% in 1993 to 1.2% in 2007. Also, the government is emphasizing higher education.

\(^\text{18}\) This is very similar to the situation in India, immediately after reforms were initiated in 1991. There was a dual exchange rate, which was eliminated after a few years.
kept within a very narrow range of 20 basis points (WTO 2006; Lane and Schmukler 2007). This de facto fixing initially resulted in further appreciation against other currencies, but toward the end of the period, the yuan depreciated. In July 2005, the yuan was revalued by 2.1% and was pegged to a basket of currencies. The yuan was also made convertible on the current account in 1996. Though it is still not convertible on the capital account, outward flows have been liberalized.

Beginning in 1979, local authorities, departments, and enterprises were permitted to buy back a certain proportion of their foreign exchange earnings at the official rate instead of having to obtain a license for all their foreign exchange needs. These retention quotas were transferable between enterprises at the administered exchange rate. By 1988, all FIEs and domestic enterprises with retention quotas could operate in the foreign exchange adjustment or swap centers. Over time, the percent of export earnings that could be retained was increased to further the government’s industrial policy objectives.

Operations in the foreign exchange market were also liberalized. In July 2005, the number of domestic and foreign participants in the foreign exchange market was raised. Since July 2006, a market maker system has been in operation in foreign exchange trading. Fifteen banks have been designated as market makers, and the setting of the exchange rate at the beginning of the day is determined by the rates at which these banks are willing to transact. These banks can transact directly without incurring the large transaction costs in the foreign exchange trading system. However, de facto, the exchange rate seems to be still pegged to the US dollar, though there has been a slight weakening of this link (Frankel and Wei 2007).

Financial System and Monetary Policy

Before reforms, there was only one bank whose main responsibility was to provide state enterprises with the resources to implement their investment plans. Monetary policy was not used for macro management of the economy. Reforms, however, have transformed this single bank into a modern market-based financial system used for macroeconomic management, which has also led to the development of various instruments to manage the system. The goals of the reforms were to increase the country’s economic growth through greater mobilization and better allocation of resources, and to assist in the management of the macro economy, which have both required institutional development reforms. These reforms have been geared to develop a wide range of financial institutions and to change the procedures under which they operated, while macro management required the creation of a monetary policy suited to the stage of the PRC’s financial development.

---

19 While India’s exchange rate is market-determined, it shows very little daily variation. The trade-weighted exchange rate calculated by the Reserve Bank of India shows little volatility. Even against the US dollar, the exchange rate showed limited volatility or variability except in 2007 or so when it appreciated considerably.

20 See Frankel and Wei (2007) for an empirical analysis of the exchange rate regime and its characteristics.

21 The liberalization of outward flows has been gradual as in the case of India. In the case of the PRC, stocks of PRC companies can be listed on the Hong Kong Stock Exchange, and PRC citizens can then buy these on that exchange.
Institutional Development

Three specialized banks were split from the People’s Bank of China (PBC) in 1979: the Agricultural Bank of China, Bank of China, and China Construction Bank. In 1981, China Investment Bank was established to on-lend funds from the Asian Development Bank and the World Bank, and it became a full-fledged commercial bank in 1994. In 1984, PBC assumed the role of the central bank, and the remaining deposit and lending functions of the central bank were transferred to a new bank, the Industrial and Commercial Bank of China. In 1985, a few specialized banks were permitted to conduct foreign exchange business in the SEZs. Participation in the foreign exchange market was substantially expanded from 1987, so by 1992 more than 1,000 branch banks and 145 nonbank financial institutions were licensed to carry out foreign exchange business. The first stock exchanges were established in Shanghai and Shenzhen in 1990.

The year 1995 was momentous for the banking sector. The Commercial Bank Law, which governed the establishment of the commercial banking system and provided for the transformation of specialized state banks to state commercial banks, was passed. The Central Bank Law, which legally confirmed PBC as the central bank, was also passed. The first non-state-owned commercial bank was also established. In 2003, foreign-invested banks in several provinces were permitted to initiate yuan-based businesses. Finally, in 2006, as part of its accession agreement with the World Trade Organization, the PRC removed all geographic limitations relating to foreign bank-offered services in domestic currency.

Foreign participation in the PRC’s banking system has been steadily increasing (Leigh and Podpiera 2006; Hope and Hu 2007) since that time. This participation is either in the form of foreign banks having their own branches or subsidiaries, or in being minority investors in PRC banks. There is a limit of 25% on foreign ownership, however. The direct presence of foreign banks remains limited, as they account for only about 2% of total banking assets.

Almost all major PRC banks now have foreign participation. The presence of foreign banks will continue to increase due to the PRC’s commitments under its accession agreement with the World Trade Organization. Under this agreement, foreign banks have been accorded national treatment. Regulations promulgated in November 2006 to implement the agreement require that foreign banks establish an incorporated affiliate in the PRC with a minimum capital of CNY1 billion, and each branch must have a minimum capital of CNY100 million. Foreign financial institutions applying to engage in local currency business must have 3 years of operating experience and have been profitable for the past 2 years.

Macro Management of the Economy

The PRC started to move toward a more active monetary policy for macro management in the mid-1980s. Until 1986, it relied on a centrally planned system of credit allocation for macro management, after which it started toward a system of market-based control. This required definition of a final target, intermediate monetary target, and operating target. In deciding on these issues, the authorities kept in mind that the banking sector dominated the PRC’s financial system (Laurens and Maino 2007; Goodfriend and Prasad 2006, 2007; Lane and Schmukler 2007). In 2003,
for instance, the increase in domestic and foreign loans made by financial institutions
was 23% of GDP, while funds raised through the share market or bonds were only
1.0% and 0.3% of GDP, respectively. The PRC also had among the highest M2\(^22\)–GDP
and credit–GDP ratios. Given the importance of the banking system in the financial
area, issues—such as interest rate liberalization—had to be handled with care so as
not to disturb the delicate balance between creditors and debtors. Weak competi-
tion in the financial sector could have undermined the effectiveness of a monetary
framework based on price signals. Also, market segmentation could have reduced the
effectiveness of price-based signals.

The final target has been stability—defined as price and exchange rate
stability—as this is beneficial for growth. PBC has the primary responsibility of man-
aging aggregate demand, because fiscal policy has been relatively ineffective.\(^23\) The
central government also tried to manage central and local government investment to
maintain macro stability. However, the incentives have worked in the opposite direc-
tion, and local authorities and enterprises have tended to add to the cyclical pressures
in the economy. Therefore, the burden of maintaining macro stability has devolved
on PBC.

The intermediate targets have changed over time (Ping 2004; Geiger 2006;
Laurens and Maino 2007). From 1986 to 1993, PRC authorities adopted targets
on currency in circulation and banks’ loan portfolios as intermediate targets. Then in
1994, as they sought to move away from a system of credit controls, they began to
treat money supply as the intermediate target.

Until 1993, the money base (M0), currency in circulation, and credit were the
main expression of interest. Three indicators of money supply were used: M0, M1,
and M2. PBC also set targets for M1 and M2 in 1993–1994. However, credit ceilings
were not entirely eliminated. Two years later, the bank announced M1 and M2 as the
effective intermediate targets. The elimination of credit ceilings occurred in 1998, and
the money supply became the only intermediate target. Now, money supply remains
an important objective for control and monetary base, and M1 and M2 are the targets.
The amount of domestic loan increases also serve as an intermediate target. The
relationship between the intermediate target and the level of economic activity is still
unstable, and in most periods, the targets have been missed by a wide margin.

PBC has deployed the usual policy instruments, including reserve requirements
and open-market operations. It supplements these with administrative measures,
which have played a very important role. Under the planned system, PBC has had a
bilateral relation with each borrower, and its objective has been to help the borrower
reach its plan targets. The challenges facing reform have been (i) to treat all financial
institutions equally and (ii) to develop an integrated national financial market. Such
reforms have proceeded gradually, and though some aspects of segmentation have
been eliminated, others continue or new ones have been created.

In addition, PBC has used money-market operations to smooth seasonal fluctua-
tions in excess reserves. Given the large balance of payments surpluses, open-market
operations have been unable to neutralize the increase in money supply stemming
from the accumulation of reserves. Open-market operations have been supplemented

---

\(^22\) M2 is a measure of money supply. It is the sum of M1 (currency in circulation and demand deposits),
and savings, time, and other deposits.

\(^23\) An exception to this is the announcement of a massive 2-year fiscal stimulus package by the Government
of the PRC in November 2008 worth $586 billion or 16% of 2007 nominal GDP.
by changes in reserve requirements, which seem to be geared more to longer-term management of monetary aggregates and window guidance. With some amount of friction, the PRC has been able to have a fixed exchange rate along with significant capital flows and an independent monetary policy.

However, capital flows were not entirely free. While inward FDI was relatively free, there was very limited portfolio inflow as the stock market was relatively underdeveloped, and outflows were strictly controlled. The movement of capital allowed PBC to have a wedge between domestic and international interest rates. The wedge also meant that the interest rate on central bank securities was lower than that on its international reserves, so the central bank, rather than making losses on its sterilization operations, actually has made profits.\(^{24}\)

PBC began using window guidance in 1998, and it became institutionalized in June 2003 when the bank published a notice aimed at curbing lending to the real estate sector (Green 2005; Geiger 2006). Subsequently, the bank had three meetings with representatives of all PRC financial institutions and asked them to pay attention to the capital adequacy ratio as credit and liquidity risks. In March 2004, the China Banking Regulatory Commission and PBC advised 11 state-owned shareholding banks to limit lending to certain sectors. They also discussed setting up a credit restriction mechanism according to each bank’s risk control capabilities and capital adequacy ratio (Geiger 2006). In May 2004, the China Banking Regulatory Commission, PBC, and several ministries issued joint guidelines for bank lending by sector. There are now monthly meetings where information and suggestions about risks and credit, both in aggregate and particular sectors, are discussed. PBC reports window guidance along with its use of other monetary instruments in its quarterly reports and on its website.

Therefore, monetary policy is not purely market-based. Further developments in money and foreign exchange markets will erode the effectiveness of these barriers, which have allowed PBC to have an independent monetary policy along with significant capital flows and a fixed exchange rate.

The sequencing of interest rate liberalization and the development of a national system have proceeded carefully along the path laid out in November 1993 at the Third Plenary Session of the Fourteenth Communist Party of China Central Committee. Restrictions on wholesale transactions were lifted first, followed by those on retail transactions. Deposit and lending interest rates on foreign currencies were liberalized before those in local currencies; loan rates were liberalized first followed by deposit rates, and long-term and large amounts first and short-term and smaller amounts later. Beginning in 1996, restrictions were lifted on wholesale transactions, including bond and interbank market rates and liberalization of the primary market for government securities. Wholesale transactions are now fully liberalized, as are interest rates on foreign currency-denominated instruments.

On liberalization of retail operations, banks were first allowed to price counterparty risks on customers within a floating margin, then to fully liberalize lending and deposit rates. The authorities reduced the number of administered rates and then allowed financial institutions to price them within a floating margin. In October 2004, ceilings on lending rates and floors on deposit rates were removed. However, floors on lending rates and ceilings on deposit rates were retained because it was feared

\(^{24}\) Since the holders of these securities get an interest rate lower than the opportunity cost of capital, there is a loss to society, which is borne not by the central bank but by other financial entities.
that competition might lead to an erosion of intermediation margins leading to greater sickness among financial institutions.

A major problem in the PRC’s banking system has been the high level of non-performing loans. Special asset management companies—often with foreign ownership—have been established to take over banks’ nonperforming loans, and the government has injected new capital into the banks. As long as SOE reforms remain incomplete, nonperforming loans will continue to be generated.

PBC has regarded the maintenance of its peg with the US dollar as an important anchor for its domestic monetary policy. It followed the US dollar when the US dollar appreciated from 1994 to early 2002, so the trade-weighted exchange rate appreciated by about 30% in this period. It also subsequently depreciated along with the US dollar. The appreciation between 1994 and 2002 argues against the government adopting a policy of an undervalued exchange rate to encourage exports. Recently, because of the strong increase in domestic credit despite vigorous sterilization efforts, PBC has not strictly adhered to maintaining a fixed exchange rate, allowing it to appreciate. The country was able to regain control of credit and other monetary aggregates only by imposing harsh administrative controls on bank lending and by controlling investment project approvals on land use—hardly conducive to market-oriented monetary policy.

An interbank bond market was put into operation in June 1997, and by the end of 2002, 945 institutions were operating in this market. The stock of tradable bonds increased from CNY72.3 billion in 1997 to CNY2,360.9 billion by the end of June 2003. By 2005, the 7-day interbank borrowing rate and the bonds repurchase rate had become benchmark rates for the money market. Since March 2004, PBC has been able to set a discount rate without seeking State Council permission.

The effectiveness of this monetary policy was limited. Banks were not sensitive to rediscount and money market rates because they had large excess reserves and held large amounts of government securities (Green 2005). There was also a shortage of alternative investment avenues. Furthermore, capital requirements for lending to corporations were higher than for lending to the government, and in terms of meeting their capital adequacy norms, banks seemed to prefer to lend to the government. Reforms that stressed lowering of nonperforming loans also encouraged banks to lend to the government. Their borrowers, particularly SOEs, were not interest-sensitive, as they still seemed to face a soft budget constraint. The money multiplier was unstable also because of inflows of foreign capital. Together, these factors made money supply difficult to control.

---

25 It has been argued that borrowers’ interest sensitivity is likely to increase because of the rise of consumer loans. It is unclear how this will work out, as the default rate on consumer loans is high.
Conclusion

The government has successfully stabilized the PRC’s economy to attain a high rate of growth with price stability. Huge swings in the level of economic activity are a relic of the past. Yet, even past swings did not approximate the extent of instability many other transition or developing economies have faced. Before 1994, the rate of growth fluctuated between 4% and 14% per year. There were also years of high inflation, but the rates hardly crossed 20%. From 1994 to 2005, the average annual rate of GDP growth was 9.6% with a standard deviation of 1.5, while from 1978 to 1993, the average annual rate was 10.5% with a standard deviation of 2.6. The inflation rate was high from 1993 to 1996: 14.7% in 1993, 24.1% in 1994, 17.1% in 1995, and 8.3% in 1996. During 1997–2005, however, the inflation rate varied only between 3.8% and –0.8%. Stability was achieved despite weaknesses in fiscal and monetary policy.

The PRC’s expenditure system has been decentralized, with provinces playing a new, important role. It is difficult to control their expenditures, however, and incentives are for a pro-cyclical expenditure policy at the province and enterprise levels. There is no evidence that PRC provinces have created the sort of difficulties for controlling the fiscal deficit that those in Argentina and Brazil have produced. Instead, PRC provinces seem to act like India’s states.26 In the late 1990s and early 2000s, although many were fearful of the burgeoning deficits at the provincial level in India, recent years have seen a remarkable turnaround. In the PRC, as in India, the pressure has been taken by other public sector entities in off-budget items. Also, losses of state enterprises in India could be covered by bonds, which in the ultimate analysis are a government liability.

In both countries, provision of social services has been under pressure. The PRC has coped better with the provision of infrastructure services, and the 1994 reforms lessened the dangers from fiscal imprudence at the subnational level. Monetary and exchange rate reforms have also strengthened the ability of the government to undertake stabilization policies.

In the PRC, an institutional framework was established for monetary policy to play a more important role in stabilizing the economy. In recent years, in the face of large inflows, monetary policy has had to rely on administrative measures rather than on market measures. Further reform of the financial system and the system for determining the exchange rate may be necessary for the successful deployment of monetary policy.

The development policy had the effect of providing incentives and means for maintaining a high rate of investment and of ensuring that the investment was allocated efficiently. The initial reforms, particularly in the agriculture sector, raised the returns on investments that had been undertaken earlier. The higher returns in manufacturing provided surpluses, which could be ploughed back into investment. The fiscal changes, apart from leaving more resources with enterprises for investment, also left more resources with local governments to meet local infrastructure demands.

26 It is sometimes argued that the highly decentralized fiscal systems in the PRC and India create problems of macro stability because of lack of clear assignment of expenditure responsibilities, high transfer dependency on the part of subnational governments, low revenue autonomy, and soft budget constraints (Martinez–Vazquez and Ryder 2005).
Both the need for efficiency and greater resources were provided by SEZs, which attracted investment for exports and ensured a high level of efficiency for competition in the world market. FDI ensured that technology and marketing knowledge of foreign markets was also available. Later, foreign trade reforms further strengthened incentives to be competitive internationally.

In contrast, when India embarked on its reforms in 1991, surpluses were unavailable and attracting FDI was difficult. The Government of India’s policies, therefore, encouraged inflow of portfolio investment. Together with exchange rate changes, it relaxed the foreign exchange constraint. The elimination of entry and investment controls then encouraged investment in new capacity creation, so the effect of the crisis on growth was short. How to create the incentive to invest and where to find the resources for investment have remained crucial issues, as identified by many major development economists, such as Ragnar Nurkse, William Arthur Lewis, and Walt Whitman Rostow.

Generally, developing countries have been relatively successful in raising investment rates and domestic savings, but less successful in sustaining the process. Usually, balance of payments deficits have forced them to scale back their investment. The success of many East Asian economies has been export growth, whether of primary commodities as in Malaysia or Thailand, or of manufactured goods as in the Republic of Korea and the PRC. Whereas the Republic of Korea depended mainly on domestic entrepreneurs and companies, the weakness of domestic entrepreneurship forced the PRC to depend more on foreign investment.

The process of reform has been very different in India. There, the government usually sets up a series of commissions to study an issue, identify problems, and suggest reform measures. The commissions examine the country’s situation, others’ experience, and relevant theoretical literature. Thus, reforms proceed slowly. India’s reforms have been much more theoretically grounded than those in the PRC. India’s reforms have also been successful in raising the rate of growth and in increasing integration with the world economy.

India’s economy has also achieved a high rate of growth and relative price stability like that of the PRC. However, the inflation rate, if measured by the consumer price index, has generally been higher than in the PRC, and the savings rate has been lower. If India is to achieve a higher growth rate—like the 10% that the government has stated—it must raise its savings rate. Its public sector savings are much lower than that in the PRC; in fact, these were negative during its Ninth Five Year Plan, which may also explain the higher inflation rate. A higher rate of public sector savings is necessary for further acceleration or even maintenance of the current rate of growth, if the rate of inflation is to be kept low.

Finally, another important feature of India’s economic performance is that the balance of payments position has been weaker. Except for 2001/02 to 2003/04, India has generally run a current account deficit. Those 3 years—when the current account was in surplus—were also years of slower growth. India, unlike the PRC, still has a balance of payments constraint on its growth. India may not be in a position to limit the appreciation of its currency because of capital inflows. Policies must be devised to not let the balance of payments become a constraint to rapid growth. It may be necessary to examine the nature of technical change and productivity growth in the services sector where India’s export strength has been compared to the PRC’s strong manufacturing sector.
References


Manchester School. 22 (2). pp. 139–191.

Ma, J. 1995. Macroeconomic Management and Intergovernmental Relations in PRC. 

International Studies Program, Andrew Young School of Policy Studies, Georgia 
State University. Atlanta, GA: Georgia State University.

Oxford University Press.

Panagariya, A. 1991. Unraveling the Mysteries of China’s Foreign Trade Regime. 

Stanford, CA: SCID.

Public Finance in Developing and Transitional Countries. Northampton, MA: 
Edward Elgar.

Research and Information System for Developing Countries (RISDC). 2007. Resurgent 
PRC: Imperatives for India. New Delhi.

Cambridge, UK: Cambridge University Press.

Winters, A. and S. Yusuf. 2007. Introduction to PRC, India and the World Economy: 

World Bank, The. 1994. China’s Foreign Trade Reform: Meeting the Challenge of the 
1990s. Washington, DC.

22951-CHA. Washington, DC.

———. 2006. World Development Indicators. Washington, DC.

The People's Republic of China (PRC) has sustained high economic growth and increasing competitiveness, which have been underpinned by massive infrastructure development. Between 1990 and 2005, its power-generation capacity nearly quadrupled, and the road network almost doubled (Table 1). Port capacity increased sixfold, and the length of civil aviation routes doubled. Also during this period, the gap between the PRC and India in terms of infrastructure capacity widened significantly, with the exception of railways. The PRC's infrastructure capacity is now approximately five times larger than India's—especially in power and ports—and much greater in expressways (Table 1).

We have attempted to answer how this has been achieved, how the PRC is financing its infrastructure investment, and what lessons India can learn from the PRC's experience. We have attempted to compare and contrast the experience in the PRC to that in India. We have also tried to draw specific lessons from a more detailed examination of two specific infrastructure subsectors—power and roads.

---

1 Rajiv Lall is the managing director and chief executive officer of Infrastructure Development Finance Company (IDFC), a specialized financial intermediary for infrastructure that provides financial assistance to projects in power, roads, ports, and telecommunications. Anupam Rastogi was a principal in IDFC's policy group and now Professor (Finance and Economics) at the School of Business Management, Narsee Monjee Institute of Management Studies (NMIMS), Mumbai. Ritu Anand is the principal advisor and chief economist at IDFC. The authors would like to thank Ning Sao and Yang Jian for their invaluable help, and acknowledge the support from Binod Singh, who arranged meetings in different cities at short notice, worked as an interpreter, and happily answered many queries raised in the course of fieldwork. They also thank Devika Fernandes, Gracinda Rodrigues, and Mamata Samant for their background research, and for checking and rechecking factual information from various sources despite a language barrier.
# Resurging Asian Giants: Lessons from the People’s Republic of China and India

## Table 1: Development of Infrastructure Capacity, People’s Republic of China and India

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power installed capacity (GW)</td>
<td>PRC</td>
<td>100</td>
<td>135</td>
<td>217</td>
<td>319</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>43</td>
<td>64</td>
<td>81</td>
<td>98</td>
<td>118</td>
</tr>
<tr>
<td>Road network (’000 km)</td>
<td>PRC</td>
<td>943</td>
<td>1,028</td>
<td>1,157</td>
<td>1,403</td>
<td>3,345</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>1,852</td>
<td>2,327</td>
<td>2,538</td>
<td>3,200</td>
<td>3,300</td>
</tr>
<tr>
<td>of which Expressways</td>
<td>PRC</td>
<td>–</td>
<td>1</td>
<td>2</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.2</td>
</tr>
<tr>
<td>Coastal ports, volume of freight handled (million tons)</td>
<td>PRC</td>
<td>310</td>
<td>480</td>
<td>800</td>
<td>1,260</td>
<td>2,930</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>129</td>
<td>163</td>
<td>223</td>
<td>334</td>
<td>513</td>
</tr>
<tr>
<td>Civil aviation routes (million km)</td>
<td>PRC</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>103</td>
<td>118</td>
<td>115</td>
<td>193</td>
<td>333</td>
</tr>
<tr>
<td>Civil aviation routes (aircraft million km flown)</td>
<td>PRC</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>103</td>
<td>118</td>
<td>115</td>
<td>193</td>
<td>333</td>
</tr>
<tr>
<td>Railways (’000 km)</td>
<td>PRC</td>
<td>55</td>
<td>58</td>
<td>60</td>
<td>69</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>62</td>
<td>62</td>
<td>63</td>
<td>63</td>
<td>64</td>
</tr>
<tr>
<td>National electrified railway (’000 km)</td>
<td>PRC</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>14</td>
<td>18</td>
</tr>
</tbody>
</table>

– = data not available, GW = gigawatt, km = kilometer, PRC = People’s Republic of China.

*a The series is discontinuous; data on rural roads is included only starting in 2005.

Sources: National Bureau of Statistics of China, various years; Ministry of Communications 2006.

## Defining Features of Infrastructure Development in the People’s Republic of China

### Infrastructure-Led Growth

Over the past 2 decades, the PRC’s growth has been investment-led and supported by rising domestic savings. Historically, the cyclicity of post-reform gross domestic product (GDP) growth in the PRC has been attributed to “boom–bust” investment cycles.2 Over time, the management of these cycles seems to have improved. Although signs of overheating have emerged in 2007, the boom till 2008 has been especially long, having taken hold in the aftermath of the Asian financial crisis of 1997/98.

Since 2003, economic growth in the PRC has accelerated to over 10% per year from about 7.5% in 1998–1999, driven by rising domestic savings and gross domestic capital formation. In just 5 years, from 2000 to 2005, the savings rate—propelled by burgeoning retained earnings of the enterprise sector—increased nearly 9 percentage points of GDP, rising to an astounding 47%, while investment rose to 41% of

---

2 The boom–bust cycle is attributed to sustained period of low interest rates and excessive credit creation in an economy leading to “boom” in investments. A correction or “credit crunch” or “bust” follows when exponential credit creation cannot be sustained.
Developing Physical Infrastructure: A Comparative Perspective on the Experience of the People’s Republic of China and India

GDP. Yet it is not just investment that has been driving the current boom, as it seems that investment in infrastructure has played an especially important role.

In sharp contrast to other East Asian countries, in which investment in infrastructure fell sharply in the aftermath of the Asian financial crisis, the Government of the People’s Republic of China relied heavily upon infrastructure investment as a countercyclical policy. Under the fiscal stimulus program that was implemented in 1997–1998 (as a result of which the consolidated deficit doubled from 1.8% of GDP in 1997 to a peak of 4.0% in 1999), the central government provided transfers to local governments and introduced the issuance of state debt (i.e., treasury bonds) to fund infrastructure. Bond issuance has continued since then, much of it going to irrigation, waterworks, transport, and urban infrastructure (Liu 2004). Although budgetary allocations for infrastructure development have fallen from their post-crisis peaks, total spending on infrastructure has continued to climb.

Infrastructure-focused fixed capital formation more than doubled from 5.7% of GDP in 1998 to over 13.0% in 2005, and the share of infrastructure in total investment spending ballooned from well under 20% in 1998 to almost one-third of gross capital formation in 2005 (Table 2). Over this period, investment in power increased by over one and a half times as a share of GDP between 1998 and 2005; investment in transport almost doubled as a share of GDP (Table 3); and the length of the country’s road network expanded by over 2.5 times, with a big push for expressways and rural roads. By 2006, infrastructure spending as a share of GDP was over 14%, making the PRC’s investment in infrastructure the highest in the world.

Although it has not been possible to establish an empirically rigorous link between infrastructure spending and GDP growth, it does appear that heavy investment in infrastructure has contributed to the PRC economy’s superior growth performance over the past decade.

Fiscal Discipline

A second remarkable feature of the PRC infrastructure development experience is that despite heavy investment in the sector, the government has managed to maintain fiscal discipline.

---

3 The China Statistical Yearbook does not present irrigation as a separate item in the fixed assets table. Irrigation infrastructure comes under the heading of “Management of Water Conservancy, Environment and Public Facilities.” Note that the item “water transport” includes coastal and river ports and associated conservancy costs.

4 There are potential inconsistencies in data sources, which need to be examined. Urban investment in fixed assets refers to all investments in county towns and urban areas, including investment in construction projects by government agencies, enterprises, and institutions.

5 The increase in power and irrigation investment is partly attributable to the significant spending on the Three Gorges Dam, which will be the largest multipurpose hydroelectric power plant in the world. According to OECD (2005), the National Bureau of Statistics of China rarely presents comprehensive information on sources, methods, and procedures of statistics. The statistical yearbook offers approximately one page of general explanations for each section (e.g., investment) and definition of variables.

6 In 2003, the PRC had the highest investment in infrastructure as a percentage of GDP, followed by Thailand. Developing countries as a whole invested 4% of their GDPs on infrastructure (World Bank 2008).
### Table 2: Macroeconomic Indicators, People’s Republic of China

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Real GDP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth (%)</td>
<td>9.6</td>
<td>8.8</td>
<td>7.8</td>
<td>7.1</td>
<td>8.0</td>
<td>8.3</td>
<td>9.1</td>
<td>10.0</td>
<td>10.1</td>
<td>9.9</td>
</tr>
<tr>
<td>(% GDP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gross domestic savings</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>39.0</td>
<td>38.2</td>
<td>40.0</td>
<td>38.0</td>
<td>41.0</td>
<td>43.0</td>
<td>47.0</td>
</tr>
<tr>
<td><strong>Gross domestic fixed capital formation</strong></td>
<td>33.8</td>
<td>32.9</td>
<td>33.8</td>
<td>35.9</td>
<td>36.5</td>
<td>37.8</td>
<td>35.0</td>
<td>38.0</td>
<td>39.0</td>
<td>41.0</td>
</tr>
<tr>
<td><strong>Government revenue</strong></td>
<td>11.2</td>
<td>12.1</td>
<td>13.0</td>
<td>14.3</td>
<td>15.3</td>
<td>17.0</td>
<td>15.9</td>
<td>16.2</td>
<td>16.6</td>
<td>17.5</td>
</tr>
<tr>
<td><strong>Government expenditure</strong></td>
<td>12.8</td>
<td>13.9</td>
<td>16.1</td>
<td>18.3</td>
<td>18.9</td>
<td>20.1</td>
<td>18.9</td>
<td>18.6</td>
<td>18.1</td>
<td>18.8</td>
</tr>
<tr>
<td>of which capital expenditure</td>
<td>1.3</td>
<td>1.3</td>
<td>1.6</td>
<td>2.4</td>
<td>3.4</td>
<td>3.6</td>
<td>4.0</td>
<td>4.0</td>
<td>3.6</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>Overall budget balance</strong></td>
<td>(1.6)</td>
<td>(1.8)</td>
<td>(3.1)</td>
<td>(4.0)</td>
<td>(3.6)</td>
<td>(3.1)</td>
<td>(3.0)</td>
<td>(2.4)</td>
<td>(1.5)</td>
<td>(1.3)</td>
</tr>
<tr>
<td><strong>Primary balance</strong></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(2.8)</td>
<td>(2.3)</td>
<td>(2.4)</td>
<td>(1.8)</td>
<td>(1.0)</td>
</tr>
<tr>
<td>FDI, net ($ billion)</td>
<td>41.7</td>
<td>45.2</td>
<td>45.4</td>
<td>37.0</td>
<td>37.0</td>
<td>37.0</td>
<td>47.0</td>
<td>47.0</td>
<td>53.0</td>
<td>68.0</td>
</tr>
<tr>
<td>Investment in infrastructure(^a)</td>
<td>6.3</td>
<td>5.2</td>
<td>6.3</td>
<td>6.2</td>
<td>6.8</td>
<td>6.3</td>
<td>7.6</td>
<td>9.0</td>
<td>12.0</td>
<td>12.6</td>
</tr>
</tbody>
</table>

|                  |      |      |      |      |      |      |      |      |      |      |
| **Memo Items**   |      |      |      |      |      |      |      |      |      |      |
| Nominal Investment in infrastructure (CNY billion) | 450  | 408  | 533  | 556  | 672  | 688  | 912  | 1,220 | 1,910 | 2,318 |
| Nominal GDP (CNY billion) | 7,118 | 7,897 | 8,440 | 8,968 | 9,921 | 10,966 | 12,033 | 13,582 | 15,988 | 18,232 |

– = data not available, FDI = foreign direct investment, GDP = gross domestic product, PRC = People’s Republic of China.

**Notes:**
1. Gross domestic fixed capital formation in 1996–1998 is from the *China Statistical Yearbook*, and thereafter, from the International Financial Statistics of the International Monetary Fund (IMF). The estimates between these two sources vary (by 1%–2% of GDP), so the jump in 1999 may not be as high. Government accounts are on an IMF basis. Overall budget balance includes central and local governments.
2. Figures in parenthesis denote a negative number.
3. Infrastructure is defined as spending on power and gas, transport, water, irrigation, and telecommunication. This is aligned with India’s Planning Commission's definition of infrastructure (Source: National Bureau of Statistics of China, various years). Infrastructure investment in 2004 and 2005 are urban investments only (see footnote 3 for clarification).

Table 3: Infrastructure Investment in 1998, 2005, and 2006 (% GDP)

<table>
<thead>
<tr>
<th>Item</th>
<th>1998</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power and gas</td>
<td>2.3</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>Transport</td>
<td>2.4</td>
<td>4.6</td>
<td>5.2</td>
</tr>
<tr>
<td>Drinking water</td>
<td>0.2</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Irrigation</td>
<td>0.4</td>
<td>3.3</td>
<td>3.5</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>0.4</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Other rural infrastructure(^a)</td>
<td>–</td>
<td>–</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total spending</strong></td>
<td>5.7</td>
<td>12.6</td>
<td>14.4(^a)</td>
</tr>
<tr>
<td><strong>India</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total spending</td>
<td>4.1</td>
<td>4.7</td>
<td>5.6</td>
</tr>
</tbody>
</table>

\(^a\) Data on rural infrastructure spending are not available for previous years, and 2006 is an estimate based on International Monetary Fund budgetary data.


Over the past decade of boom, the PRC has seen continued progress in the corporatization of its state-owned enterprises (SOEs). Moreover, the state budget—at all levels of government—has become progressively less tangled with the operations of the country’s vast industrial, manufacturing, and state banking complex. As a corollary to this initiative, the PRC has focused on improving its tax revenues. Thus, even as government expenditures have grown with many previously off-budget expenses, there has been no deterioration in the performance of government savings (Table 4). In fact, tax revenues more than cover current expenditures and partially finance capital expenditures. If nontax revenues are also included, more than two-thirds of capital expenditure is covered by budgetary revenues, leaving only one-third to be financed by government borrowing.

Maintaining this fiscal discipline has meant that the PRC has delivered substantial growth in infrastructure spending with little dependence on the state budget. From 1997 to 1999, the government used increased budgetary allocations to infrastructure spending as the basis of its post-Asian financial crisis countercyclical fiscal policy. Since then, the government has maintained capital expenditures from the consolidated budget in the range of 3%–4% of GDP, and it has retained its focus on infrastructure spending by allocating an increasing share of these expenditures to the sector.

However, the bulk of the growth in infrastructure spending has come from corporatized SOEs and/or subnational government agencies that have funded themselves through off-budgetary means. Further, there is no evidence of any growth in a “quasi-fiscal deficit” through hidden subsidies or losses in the system. In fact, indications are that SOE financial performance has been improving as has the health of the banking system, where the practice of policy lending—quite common in the late 1980s and early 1990s—seems to have given way to more disciplined lending and
Resurging Asian Giants: Lessons from the People’s Republic of China and India

Therefore, the PRC has relied much more on user fees and capital levies to recover the cost of building and to maintain core infrastructure.

Urban Focus

A third feature of the PRC infrastructure development experience is its strong urban bias, which is reflective of the nature of growth in the PRC. There has been a marked shift in investment toward urban infrastructure over time (Table 5). Compared with 77% in 1997, the share of investment in urban fixed assets increased sharply to 89% in 2008. The increase in asset prices, including real estate, may explain some of this increase.

Table 4: Consolidated Fiscal Balance, People’s Republic of China and India (% GDP)

<table>
<thead>
<tr>
<th></th>
<th>People’s Republic of China</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current expenditure</td>
<td>14.4 14.4 14.8 15.6</td>
<td>24.5 23.3 23.0 23.5</td>
</tr>
<tr>
<td>Total revenue</td>
<td>16.1 16.6 17.5 18.3</td>
<td>18.7 19.6 19.7 21.1</td>
</tr>
<tr>
<td>of which tax revenue</td>
<td>14.7 15.1 15.8 16.6</td>
<td>15.0 15.8 16.6 17.7</td>
</tr>
<tr>
<td>Nontax revenue</td>
<td>1.4 1.5 1.7 1.7</td>
<td>3.6 3.7 3.5 3.3</td>
</tr>
<tr>
<td>Capital expenditure</td>
<td>4.0 3.6 3.8 3.9</td>
<td>3.3 3.6 3.6 3.8</td>
</tr>
<tr>
<td>of which infrastructure (urban)</td>
<td>– 1.1 1.2 1.3</td>
<td>– – – 2.4</td>
</tr>
<tr>
<td>Government saving (+) or dissaving (–)</td>
<td>1.7 2.2 2.7 2.7</td>
<td>(5.8) (3.7) (3.3) (2.4)</td>
</tr>
<tr>
<td>Consolidated deficit</td>
<td>(2.4) (1.5) (1.3) (1.2)</td>
<td>(9.1) (7.3) (6.8) (6.2)</td>
</tr>
</tbody>
</table>

= data not available, GDP = gross domestic product.

Notes: 1. Government saving or dissaving is taken as total revenue less current expenditure, as the extent of capital receipts is not available.

2. Figures in parenthesis means the number is negative.

Table 5: Structure of Investment of National Economy (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total investment in fixed assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>NA</td>
<td>77.0</td>
<td>84.6</td>
<td>89.0</td>
</tr>
<tr>
<td>Rural</td>
<td>NA</td>
<td>23.0</td>
<td>15.4</td>
<td>11.0</td>
</tr>
<tr>
<td>Funding sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State budgetary appropriations</td>
<td>8.3</td>
<td>2.8</td>
<td>4.4</td>
<td>3.9</td>
</tr>
<tr>
<td>Domestic loans</td>
<td>17.3</td>
<td>18.9</td>
<td>17.3</td>
<td>16.5</td>
</tr>
<tr>
<td>Foreign investment</td>
<td>6.6</td>
<td>10.6</td>
<td>4.2</td>
<td>3.6</td>
</tr>
<tr>
<td>Self-raised funds and other investment</td>
<td>67.8</td>
<td>67.7</td>
<td>74.1</td>
<td>76.0</td>
</tr>
</tbody>
</table>

NA = not available.

This marked bias is not surprising given the PRC’s development trajectory. The pattern of infrastructure development has been integrally linked with the country’s export-led strategy. Priority was given to building infrastructure in coastal areas, first to special economic zones, associated port capacity, and road transport links. This coastal urban improvement in the 1980s was an important factor in making these areas highly competitive in attracting manufacturing foreign direct investment (FDI), setting precedents for subsequent waves of infrastructure investment (ADB, JBIC, World Bank 2005). The policy was encapsulated in the slogan “Let Some Areas Get Rich First.”

From 1993, focus shifted to accelerating the pace of urbanization to absorb surplus rural labor (Chen 2005). As the share of urban population surged from about 27% of the total to about 45% a decade and a half later, significant attention was devoted to the rapid build up of infrastructure in major eastern and southern cities. Urban road networks, mass rapid transport systems, water supplies, and waste management systems were developed even as intercity connectivity was improved through investment in airports, highways, and railways. Investment in power-generation capacity also grew but barely kept pace with the escalating demands of industrial activity. Following endemic blackouts due to acute shortages in 2002, the scale of investment in power-generation capacity was accelerated, with installed capacity doubling by 2007 in an effort to keep the engines of urban-centric industries humming.

Over recent years, the government has become highly sensitized to the need to develop infrastructure in the poorer western and central regions that were neglected. From the 11th Five-Year Plan, emphasis has moved toward the development of rural infrastructure under the slogan of a “harmonious society.”

High Local Participation in Infrastructure Development

A common misperception about the PRC is that investment—especially infrastructure investment—if not planned, remains highly centralized and financed largely from the central budget and/or loans that are easily available from state-owned banks. In fact,
financing from the state budget has been declining steadily and now accounts for less than 4% of the total financing requirement for fixed capital formation (Figure 1). The central government’s share of this financing is even smaller.

While it is true that the PRC tax system was recentralized following the Budget Law (1994) and that the central government collects more than half of tax revenues today (up sharply from 20% in the early 1980s), its share of budgetary expenditures has declined steadily from over 50% in the early 1980s to under 30% in 2005 (Naughton 2007). It is supported by a system for intergovernmental transfers that has become more systematized. In fact, budgetary expenditures have become progressively less a source of financing for investment as subnational governments have gained more and more autonomy in the development decision-making process.

Deng Xiaoping’s 1992 Southern Tour emphasized decentralization and unleashed competition between subnational governments to attract FDI. Indeed, an important parameter on which national leadership judged local party leadership was the volume of FDI that they had managed to attract. Given the importance to foreign investors of infrastructure, local authorities enthusiastically embraced the development of physical infrastructure.

Lacking a strong local fiscal base and prohibited from borrowing, provincial and local governments have turned to alternative ways of raising resources to finance infrastructure development. As a result, the overwhelming proportion of resources for investment comes from such “self-raised and other funds” of local governments and of the enterprises that they own or control. These funds, comprising a combination of enterprise-retained earnings and extrabudgetary revenues, accounted for more than 55% of the funding requirement for fixed investment in 1981. Their contribution had risen to more than 75% of total investment financing by 2006 (Figure 1).10 Such self-raised and other funds also contributed to financing infrastructure investment in large measure—as much as 58% of infrastructure investment financing in 2006 (Table 6).

Limited Private Sector and Foreign Participation

The fourth noteworthy characteristic of the PRC’s infrastructure experience is the limited extent of private or foreign participation in the sector. Although the PRC has experimented with many models for private participation in infrastructure,11 none has been fully developed and implemented (Bellier and Zhou 2003). Fixed investment in infrastructure is a substantial part of overall fixed investment in the economy (Table 2). Aside from a short-lived period in the mid-1990s when foreign investors were invited to invest in power-generation projects, FDI inflows into overall fixed investment and, therefore, in infrastructure have been modest (Figure 1). In 2006, FDI accounted for less than 2% of the capital funds invested in infrastructure (Table 6).

In infrastructure, state-owned companies dominate. In some key sectors such as telecommunications, the government has created a small number of large companies that operate as oligopolies. A few of them operate in more than one region and some of them have nationwide network. In other cases, such as power generation and expressways, a few national champions compete with smaller companies owned by provincial or lower-level governments. Private participation has been restricted to investment in the stock of the few (but growing number) of state-owned companies that are listed.

---

10 This is consistent with the rising share of enterprise savings in total savings.
11 For different models, see Chan and Doloi (2007).
Figure 1: Sources of Financing for Overall Fixed Investment


Table 6: Sources of Funds for Fixed Investment in Infrastructure, 2006

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Funds ($ billion)</th>
<th>State Budget (%)</th>
<th>Domestic Loans (%)</th>
<th>Foreign Investment (%)</th>
<th>Self-Raised Funds (%)</th>
<th>Others (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total investments in urban infrastructure</td>
<td>360.7</td>
<td>9.7</td>
<td>30.7</td>
<td>1.8</td>
<td>50.0</td>
<td>7.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Power</td>
<td>97.5</td>
<td>4.2</td>
<td>45.3</td>
<td>1.2</td>
<td>42.9</td>
<td>6.4</td>
<td>99.8</td>
</tr>
<tr>
<td>Water</td>
<td>8.5</td>
<td>9.5</td>
<td>19.9</td>
<td>4.0</td>
<td>59.0</td>
<td>7.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Transport</td>
<td>139.4</td>
<td>12.8</td>
<td>30.8</td>
<td>2.7</td>
<td>44.9</td>
<td>8.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Railways</td>
<td>24.9</td>
<td>30.3</td>
<td>17.1</td>
<td>1.3</td>
<td>36.6</td>
<td>15.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Roads</td>
<td>77.7</td>
<td>10.8</td>
<td>35.5</td>
<td>1.1</td>
<td>45.3</td>
<td>7.3</td>
<td>100.0</td>
</tr>
<tr>
<td>MUTS</td>
<td>10.2</td>
<td>3.6</td>
<td>45.2</td>
<td>1.5</td>
<td>45.0</td>
<td>4.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Water transport</td>
<td>13.3</td>
<td>1.6</td>
<td>26.5</td>
<td>7.4</td>
<td>55.4</td>
<td>9.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Air transport</td>
<td>6.4</td>
<td>11.8</td>
<td>29.7</td>
<td>17.9</td>
<td>26.2</td>
<td>14.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Pipelines</td>
<td>0.9</td>
<td>10.2</td>
<td>34.6</td>
<td>1.2</td>
<td>53.9</td>
<td>0.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Other</td>
<td>5.7</td>
<td>7.1</td>
<td>12.8</td>
<td>5.8</td>
<td>69.9</td>
<td>4.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>21.2</td>
<td>1.5</td>
<td>3.7</td>
<td>1.1</td>
<td>91.1</td>
<td>2.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Irrigation</td>
<td>94.3</td>
<td>12.8</td>
<td>22.7</td>
<td>1.0</td>
<td>55.2</td>
<td>8.3</td>
<td>100.0</td>
</tr>
</tbody>
</table>

continued on next page
Table 6 continued

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Funds ($ billion)</th>
<th>State Budget (%)</th>
<th>Domestic Loans (%)</th>
<th>Foreign Investment (%)</th>
<th>Self-Raised Funds (%)</th>
<th>Others (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total investments in rural infrastructure</td>
<td>26.9</td>
<td>100.0</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>100.0</td>
</tr>
<tr>
<td>Total investment in infrastructure</td>
<td>387.6</td>
<td>16.0</td>
<td>28.5</td>
<td>2.1</td>
<td>46.5</td>
<td>6.9</td>
<td>100.0</td>
</tr>
<tr>
<td>As % of GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>13.4</td>
<td>2.3</td>
<td>4.1</td>
<td>0.3</td>
<td>6.7</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>1.0</td>
<td>1.0</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
</tbody>
</table>

= data not available, GDP = gross domestic product, MUTS = Mass Urban Transport System.

a Data for rural infrastructure spending and its composition are estimates based on International Monetary Fund data.


One of the reasons for limited private sector participation in infrastructure development is that the National Development and Reform Commission (NDRC) has retained centralized control of planning while decentralizing responsibility for building to local governments. The high level of political risk and lack of certainty on tariff regulation has also discouraged private infrastructure investment (Finlayson 2007). More recently, the government has taken initiatives to attract strategic investors by making tariff regimes more transparent and market-based. This has attracted players into ports, airports, and expressways.

**Financing of Infrastructure**

**A Bird's Eye View**

The PRC has had phenomenal success in finding domestic resources to fund its aggressive infrastructure development. Figure 2 provides a schematic overview of the financing chain for infrastructure in the PRC.

From the point of view of a consumer of infrastructure services, there are only four ways in which these services can be financed: (i) taxes, (ii) extrabudgetary levies, (iii) user charges, or (iv) a subsidy. To the extent that taxes, extrabudgetary levies, and user charges do not generate enough revenue to cover the cost of building, operational cost and return on equity, consumers enjoy some level of implicit financial subsidy (which may be eminently justifiable on economic and/or policy grounds, given the public good nature of infrastructure).

Broadly, it appears that the consumer of infrastructure services does not benefit from very large implicit or explicit financial subsidies. The central and local governments recover the bulk of their capital expenditure for infrastructure development.
Developing Physical Infrastructure: A Comparative Perspective on the Experience of the People’s Republic of China and India

through a combination of general and specific taxes and off-budgetary levies. User fees are also higher in the PRC than one might expect. They seem sufficient to cover at least the cost of servicing the debt deployed for funding the construction of assets as well as for operation and maintenance.

This is not to say that consumers bear a market-determined cost for infrastructure delivery either directly through user fees or indirectly through taxes. They do enjoy an implicit subsidy, the cost of which is borne in part by the suppliers of infrastructure services through a submarket return on their equity, and in part by the banks whose profitability has been depressed because of a persistent degree of financial repression. The implicit subsidy varies from subsector to subsector. For example, the implicit subsidy is very low to nonexistent in the telecommunications and port sectors, where the suppliers of the services are probably earning close to market rates of return on their equity. On the other hand, in the case of power and road sectors, the implicit subsidy is likely still quite large (for roads, see Figure 8).

In essence, the infrastructure sector’s capital structure has three components: (i) a grant component that does not expect any return, (ii) an equity component, and (iii) a debt component. In the PRC, the grant component (in the form of allocations from the consolidated government budget) contributes an estimated 16% of the sector’s funding needs. The equity part (provided by a range of players, including local governments and their agencies, corporatized and/or listed SOEs, and foreign and other investors), contributes 54% of the sector’s capital structure. Additionally, debt—provided mainly by domestic banks (including China Development Bank)—accounts

Figure 2: Infrastructure Financing Chain in the People’s Republic of China

FDI = foreign direct investment.

Note: Extrabudgetary funds of subnational governments are about 1% of gross domestic product (GDP) (World Bank 2005a). Rural infrastructure investment is about 1% of GDP (IMF data). The extent of bond financing is an estimate.

for the remaining 30% of the sector’s capital structure. In financial terms, the sector is significantly underleveraged, which implies that the return to equity providers is likely, on average, to be depressed relative to the expectation of purely market players.

The average return masks a range of returns on equity that accrue to different types of providers of equity. Local governments and their agencies may not earn meaningful financial returns on their equity investments in local roads, for example. Yet they are at least recovering their capital expenditure, as well as associated operations and maintenance expenses, through a variety of extrabudgetary levies and nontax revenue streams such as land sales. Otherwise, the unfinanced gap would show up somewhere as borrowing. While the effective leverage in the PRC infrastructure sector could well be higher than as indicated in Figure 2 because of “hidden” leverage of local government agencies or the cascading leverage of SOEs investing equity in the sector, the central government does not encourage this practice and is taking steps to monitor and control it.\(^\text{12}\) Data on this are hard to find, but our hypothesis is that there is not much more leverage embedded in the PRC infrastructure finance chain than hypothesized in Figure 2.

Similarly, the centrally owned grid companies in the PRC power sector do not seem to generate a market rate of return due to their obligations to pay high charges to power generators and the government’s reluctance to let them increase user charges on a pass-through basis. On the other hand, user charges for operating expressways are high enough to attract several private foreign investors to invest in highway concessions for a market rate of return. Similarly, user charges for electricity generation are high enough to allow the handful of dominant SOEs to earn a reasonable return on equity.

From a public policy perspective, the above mechanism for infrastructure finance works because it has managed to distribute the burden of providing the public good among (i) government, which is effectively the provider of grant financing through budgetary allocations; (ii) infrastructure service suppliers—both government and nongovernment—that are owners of the equity with different return expectations; and (iii) banks and other financiers that are providers of the debt.

The government is not overburdened by huge budgetary obligations toward the infrastructure sector that might make its fiscal situation unsustainable. As noted earlier, the PRC has managed to keep its fiscal deficits well under control. Local governments, as providers of equity, may not earn meaningful financial returns on their investments, but they do generate significant economic rates of return. The cross-subsidy thus provided by central and local governments allows consumers not to be overburdened by user charges that are so onerous that they are unable or unwilling to pay, yet are sufficient to ensure that (i) debt service obligations to banks are met, (ii) an array of corporatized and/or listed SOEs enjoy a reasonable (though not quite market) return, and (iii) some truly private investors get a market return.

As it turns out, the success of the system hinges on the fact that the bulk of the infrastructure service suppliers—and therefore the providers of equity to the sector—are owned and/or controlled by the central or subnational governments. They can, therefore, remain satisfied with a return on equity that is high enough to keep them financially sustainable, but modest by the standards of the private sector. Likewise, state-owned banks can continue to provide large volumes of debt in a financially

\(^{12}\) There are reports of local governments attempting to circumvent the prohibition on borrowing by setting up investment trusts that are able to take advantage of leverage (Box 3).
sustainable manner as long as their loans are serviced, even if their profits remain depressed partly due to interest rate regulation.

**Sources of Infrastructure Finance**

**Foreign Direct Investment**

Infrastructure projects have been funded primarily from domestic sources, with limited foreign investment (Table 6). FDI was just 2% of infrastructure financing in 2006. At its peak in the mid-1990s, it accounted for 10% of infrastructure financing.\(^\text{13}\)

**Budgetary Appropriations**

As noted earlier—and contrary to popular belief—the state budget (which includes budgetary appropriations and transfers from the central government budget) finances only about 10% of infrastructure investments.

**Debt Financing**

Domestic debt financing—in the form of either loans from banks and nonbank financial institutions or bonds—account for less than one-third of infrastructure funding. Although all banks lend for infrastructure, the most important institution for lending to infrastructure is China Development Bank. In 2006, China Development Bank accounted for about 8% of domestic loans to infrastructure (Box 1).

**Self-Raised Funds**

By far, the most important source of infrastructure finance is “self-raised funds.”\(^\text{14}\) They contribute more than half of total investment financing in infrastructure, with different sectors generating funds varying from 26% in air transport to over 90% in telecommunications (Table 6). They comprise three types of revenue streams: (i) retained earnings of enterprises, (ii) extrabudgetary funds of local authorities, and (iii) other nontax revenue that is principally drawn from the leasing of land and/or asset sales.

Retained earnings of SOEs, comprising depreciation and profits, have been growing rapidly over the past decade and are now composed of more than half of gross domestic savings, or over 20% of GDP. This reflects the improving performance of SOEs over time. The free cash flow generated by SOEs has, therefore, become a significant source of funding for infrastructure investment. Local governments are able to tap into the cash flow of SOEs under their control to invest or cross-subsidize infrastructure development in their local areas.\(^\text{15}\)

Extrabudgetary funds comprise a range of formal and informal (e.g., unregulated) levies imposed by local governments, the proceeds of which are used for investment (Box 2). Unlike other countries, all levels of government in the PRC collect user charges, surcharges on utilities, and informal taxes. Most are designated for specific

\(^{13}\) FDI includes a limited amount of foreign borrowings from foreign governments and international financial institutions, export credit, commercial loans from foreign banks, and issue of overseas bonds.

\(^{14}\) According to the statistical yearbook, self-raised funds refer to extrabudgetary funds for investment in fixed assets received by investing units from central government ministries, local governments, enterprises, and institutions, including their own self-raised funds.

\(^{15}\) For example, a number of local government-owned industrial companies may contribute equity capital to create local electricity-generating capacity.
Box 1: China Development Bank and Infrastructure Projects

China Development Bank (CDB), which is the largest of the three policy banks, enjoys a close relationship with the Government of the People’s Republic of China (PRC). Its mandate is to provide medium- and long-term funding for projects. It also supplies financing to less-developed regions and for other government priorities. Approximately 45% of its outstanding loans are for projects in western and central regions, reflecting the government’s policy of promoting their development. The CDB lending plan is determined by the People’s Bank of China and the National Development and Reform Commission, but implementation is increasingly left to the bank’s discretion. Close to a quarter of its lending is devoted to public infrastructure projects, especially in the power and land transport sectors.

The CDB balance sheet grew from $63 billion in 1998 to $290 billion by the end of 2006. Its assets and loans have expanded at an annual rate of about 20% in the last decade. In 2006, the growth of loans slowed to 15% as CDB diversified into financial advisory, asset management, and asset securitization services. CDB is a whole-sale institution, relying largely on the issuance of “infrastructure bonds” to state-owned banks as its source of funding.

Some of the projects undertaken by CDB may not be commercially viable but have the potential for partial cost recovery due to credit enhancement features. Overall, the bank is profitable, with a return on equity of about 17.0% and return of assets of 1.2%. CDB has the lowest nonperforming loan ratio among all banks in the PRC, partially because of its preferred-creditor status with local governments. Loan guarantees are usually loose and typically come from related parties, while local governments often provide unenforceable letters of comfort, usually indicating the importance of the projects to local economic development. However, local governments’ leverage over CDB’s borrowers has proven to be as effective as any formal guarantee, as local authorities have an incentive to compel repayment of CDB loans to access further funding to other projects in the region.

Sources: China Development Bank annual reports, various issues; Standard & Poor’s 2007.

purposes, such as the “airport user charge,” which is earmarked for airport upgrading. These levies and charges are managed by designated government agencies for the purpose of making earmarked investments, and they are not reflected in enterprise revenues or in government budgets. They amount, therefore, to an equity contribution of local governments to infrastructure development.

Revenues from land leasing are an important source of funds for municipal, city, and township governments in particular. All land in the PRC belongs to the state.

Land leasing involves the upfront sale of long-term occupancy and development rights, of about 40–70 years. The practice was introduced on an experimental basis in 1987 in Shenzhen and other coastal cities as part of the de facto decentralization of the PRC fiscal system. Until that time, public authorities allocated land administratively, and land use was free. In 1988, the constitution—which previously had prohibited all types of land transfer—was amended to permit land leasing while retaining public ownership of land. The land-leasing reforms were intended, in part, to stimulate locally led economic development by allowing cities to attract foreign investment by providing stable land occupancy rights to investors. In 1990, the State Council formally affirmed land leasing as public policy. By 1992, Beijing and Shanghai had adopted
Box 2: Extrabudgetary Funds

Within the state sector, own funds can be broadly divided into enterprise-retained funds (e.g., depreciation and profits), contributions from related government enterprises and agencies, earmarked funds, and other extrabudgetary revenues of subnational government units.

Starting in the late 1980s, extrabudgetary earmarked funds proliferated in the form of local surcharges over nationally earmarked budgetary levies, such as the power development levy, a charge on each kilowatt-hour of electricity generated; railroad construction levy, a per ton per kilometer charge; and road construction tax on the purchase of motor vehicles. There are a range of additional surcharges and fees that some localities levy, including airport construction fees, port construction surcharges, and long-distance telephone surcharges.

These funds are generally managed by government agencies rather than enterprises. Typically, provincial line bureaus, through state-owned enterprises under their control, are responsible for collecting the fees, and the State Development and Reform Commission (SDRC) and finance bureaus closely supervise their use. Government agencies, such as SDRC under the supervision of the National Development and Reform Commission, appropriate and allocate them to priority projects in provinces.

Given the lack of autonomy on taxation at the local level, some local governments have been overzealous in the application of ad hoc or unauthorized levies in an effort to shore up their fiscal base. This has contributed to discontent among rural inhabitants in some regions and invited strong reaction from the central government. There are four types of extrabudgetary levies that are fully authorized: (i) fees collected by public institutions and administrative agencies, (ii) township unified levy or village retained fund, (iii) contributions to social insurance funds, and (iv) fees collected by local finance bureaus (Naughton 2007).


land leasing as local practice, and soon it began to spread westward to the rest of the country. Originally, municipalities transferred land rights to developers primarily by private negotiation, but in 2002, they were instructed to conduct all land leasing through public bidding at auctions. Municipalities were slow to accept the new limitations, but it is becoming the primary form of conveyance in economically advanced cities (Peterson 2006). Proceeds from land leasing have become a significant source of financing urban infrastructure development.

The role of publicly owned land in urban infrastructure finance extends well beyond direct proceeds from land-leasing sales. Borrowing from state-owned commercial and development banks has financed much of the remaining urban infrastructure

---

16 The speed with which land leasing was adopted can be seen in Shanghai’s records. From 1988 to 1991, 12 land leases were granted in Shanghai. The total rose to 201 in 1992 and 3,000 in 1993 (Fu 1996).

17 Because comprehensive municipal budgets are not publicly available, it is difficult to compile reliable data on the magnitude of land leasing except through case studies. A study carried out by the World Bank suggests that direct revenues from land leasing can generate a substantial part of the municipal capital budget for 10–15 years, even when investment levels are as high as they have been in the PRC (Peterson 2006).
Box 3: Financing of the Outer-Ring Highway in Changsha

The interaction among land leasing, debt, and infrastructure investment is illustrated by the construction of the outer-ring circumferential highway in Changsha, capital of Hunan Province. To finance the project, the municipality transferred leasing rights for strips of land 200 meters wide on both sides of the highway (totaling 33 square kilometers of land) to a public–private agency, the Ring Road Investment Corporation. Of this land, 12 square kilometers were finished land, possessing infrastructure access and development approvals. In its original state, without access to roads or infrastructure, the remaining land had very little market value. However, the plan was to sell off land parcels once the highway was built.

The total cost of the second stage of the highway project was estimated at CNY6 billion (about $730 million). Approximately half of this amount was financed directly from the sale of leasing rights to the land already having infrastructure. The other half was financed through borrowing. The Ring Road Investment Corporation was able to borrow against the future anticipated value of the improved land to obtain financing from the China Development Bank and commercial banks, pledging to sell off land parcels in the future, after the highway was completed, to meet debt service.

Source: Peterson 2006.

investment. This borrowing takes the form of balance-sheet debt, typically secured by municipally owned land. Debt service often is paid by selling off the leasing rights of land whose value is enhanced by the debt-financed infrastructure projects (Box 3).

Given the importance of land leasing to the fiscal capacity of cities and to urban infrastructure development, municipalities try to acquire as much land as cheaply as possible, lease it at market rates, use it as collateral for infrastructure loans, or provide it at below-market rates to strategic (mostly foreign) investors for industrial development. Municipalities acquire land in various ways. They can move municipal SOEs from central locations to the urban outskirts. They can acquire land from rural communes and convert it to urban use. Reportedly, a municipality’s price for leasing land for urban use vastly exceeds the acquisition price it pays to farmers, often by a factor as large as 50–60 times or more. A municipality can also acquire land in centrally located areas of rundown housing or small-scale businesses, upgrade the infrastructure, and sell land-leasing rights for redevelopment.

A Closer Look at the Financing of the Power Sector

Reforms and the Power Sector Financing Chain

The expansion of power-generation capacity in the PRC has been truly remarkable. On average, 15 gigawatts (GW) of capacity has been installed every year since the mid-1980s, and as much as 30 GW on average every year since 1995. From 2002 to 2007, the PRC doubled installed generation capacity. It added over 100 GW of capacity in 2006 alone, and then added almost another 100 GW in 2007, to reach a total installed capacity of 713 GW.

Crucial reforms—starting in the early to mid-1980s—paved the way for this impressive performance (see Box 4 for more details on the phases of power sector
Box 4: Power Sector Reforms in the People’s Republic of China—Financing and Unbundling

The People’s Republic of China successfully diversified its funding sources for power investment away from state budgetary dependence in the mid-1980s by partially decentralizing investment authority in the power generation subsector. These early reforms aimed to raise capital for capacity expansion to overcome electricity shortages by allowing local governments, state-owned industrial enterprises, and private (including foreign) investors in power generation. To make power generation attractive, tariffs for new power plants were raised to cover costs, plus a 12%–15% rate of return was promised. In addition, a fee was added to end-user prices to raise capital for a newly established electricity construction fund, part of which enabled provincial governments or their financial companies to expand generation capacity. A wide range of special fees and charges were also collected by state and local governments to finance various projects, such as construction of the Three Gorges Dam.

Meanwhile, the central government also began to raise its own investment capital from financial markets. Huaneng Power International was founded by the central government in 1985 to raise funds from international equity markets. The former Ministry of Electric Power Industry (MEPI) and its successor, the State Power Company (SPC), issued bonds in 1997 and 1998. Moreover, the first Electricity Law was promulgated in 1995 to protect the interests of new investors. Thus emerged a number of power generators at local levels, characterized as the “periphery,” which supplemented the central government-controlled power companies or the “core” (Zhang and Heller 2004).

The next stage of reforms was aimed at reducing the role of government in business. As part of these economy-wide reforms, MEPI (along with a dozen other ministries) was dismantled in 1998. Its commercial functions were transferred to the SPC, which was created in 1997, and its administrative functions were assigned to other government agencies. SPC, like a holding company with generation and transmission assets, operated through its subsidiaries, which were given more autonomy by SPC. The system, however, began to experience conflicting interests and political complications in capacity development and power dispatch. In 1999, when a power surplus emerged after the Asian financial crisis, SPC began experimenting with wholesale market competition on a limited basis in six provinces. The experiment was unsuccessful, as tensions between the core and periphery developed due to parochial interests prevailing in power dispatch.

The third and current stage of reforms aimed to create a competitive market and seems to have reasserted the central government’s control. The vertically integrated SPC was unbundled in 2002, and a separate regulatory authority was set up in 2003. The central government separated generation assets from transmission and distribution. Five national generator groups were set up: Huaneng Power International, Datang International Power Generation, Huadian Power International Corporation, China Guodian Power, and China Power Investment. Two grid companies were established, the State Grid Corporation of China and the China Southern Power Grid Corporation. The State Grid Corporation of China has six regional grid subsidiaries, under which a number of provincial electricity companies own and operate their local transmission and distribution networks. The law guarantees open access to the transmission system, but virtually no one takes advantage of this provision. The provincial grid company is the only buyer to purchase electricity from the generators within the province and from other provincial grid companies. A national grid is being constructed, and an incipient power market exists.
Reforms. First, reform focused on decentralizing power generation and coal mining, removing them from the centralized planning process and allowing in new players with access to sources of capital outside of the government budget. Second, special tariffs were introduced for new plants, earning a guaranteed return on a cost-plus basis, and coal prices were progressively deregulated. Third, the government very deliberately—albeit selectively—facilitated the access of emerging state-owned power-generation companies to bond and equity markets.18

In the early phase of reforms, provincial and national SOEs—actively nurtured by the Ministry of Power as well as local governments eager to develop local industry—began investing their retained earnings into power generation on a commercial basis. By the mid-1990s, reforms also induced several private (including foreign) investors to enter the market for power generation as commercially-run independent power producers.19

With the proliferation of players, the share of power generated by the central government (and its state-owned companies) has come down sharply over the years. The central government now accounts for about 40%–45% of power generated, split into five separate companies, each with a national footprint and access to equity markets through listings on the stock exchanges. Thirty large provincial-level generating companies, also with access to equity markets, account for 10% of generating capacity. A handful of independent power producers have another 8% market share. The remaining 40% of generating capacity is spread out over several smaller provincial and subprovincial companies (Figure 3).

The coal mining industry—the fuel source for more than three-quarters of the country’s installed generation capacity—has witnessed a similar evolution. In response to an acute shortage of coal, the previously state-controlled sector was thrown open to privately and collectively owned mines that were free to sell at market rates. Although a few sizeable central government-owned players remain, the industry has become fragmented with the entry of a large number of subnational—and even community-level—enterprises, which mine coal on a commercial basis. The top three state-owned coal companies, while of global scale, account for less than 15% of domestic production (Rosen and Houser 2007).

18 By restricting supply, the central government has been able to allow bonds to be issued at interest rates as low as 3%, creating an implicit subsidy for favored enterprises (Zhang and Heller 2004).

19 Although they became disenchanted later when the government reneged on their power-purchase agreements following the Asian financial crisis glut in the power market.
Figure 3: Power Sector Market Structure in the People’s Republic of China

- **Market price**
  - Fuel (Coal—76% generation capacity)

- **Fixed by govt.**
  - Transport (40% rail freight and 33% river and sea freight)
  - Subnational (48%) and central govt. (44%) producers
  - IPPs (8% bilateral contracts)
  - Wholesale power exchange

- **Generation**
  - 10% of power only

- **Transmission monopoly**
  - State Grid Corporation of China and China Southern Power Grid Corporation
  - Provincial and/or city distribution companies
  - Local monopoly—captive retail and bulk consumers

Figure 4 shows the financing chain for the power sector. The government’s success in attracting a wide range of new players into the space has meant that enterprise-retained earnings have become the most important source of funding for fixed investment in the power sector. Self-raised funds accounted for more than 40%–50% of the fixed investment funding requirements of the sector in 2006, comprising the retained earnings of various enterprises (i.e., state-owned, private, and foreign) that now operate in the sector.

In addition to retained earnings, another 8% of fixed investment funding requirements now come in directly as equity from foreign investors (as joint venture partners) or indirectly as equity from private (mostly foreign) investors in the stock markets. Domestic banks provide as much as 45% of the funding needs in the form of debt.

Finally, although dependence on budgetary appropriations has diminished over time, they still contribute about 4% of the fixed investment funding needs of the sector. In fact, since the early stages of the reform process, the government had introduced many special levies and surcharges on end users to finance a national electricity fund as well as to support critical national initiatives such as the Three Gorges Dam and the development of nuclear-generating capacity.²⁰

Overall, diversification of funding sources has been key to the PRC’s success in ramping up its power-generation capacity.

²⁰At their peak in 1999, these surcharges added about 20%–24%, on average, to the grid-selling price. Although residential consumers paid 10% extra, commercial users paid as much as 30% more.
**Figure 4: People’s Republic of China’s Power Sector Financing Chain, 2006**

FDI = foreign direct investment, c/kWh = cents per kilowatt-hour.

Note: (i) Effective user charges assume a 7.5% transmission and distribution loss; (ii) division of retained earnings into coal-mining, power-generation, and grid companies is based on Figure 7; and (iii) assume bond financing is now negligible.

Source: National Bureau of Statistics of China 2007; Table 6; Figure 7.

**Market Structure and Burden Sharing**

The average end-user electricity tariffs in the PRC are not high by international standards (Figure 5). At 6.3 cents per kilowatt-hour,21 the weighted average tariff in the PRC is at about the same level as in India (Table 9). At the same time, as noted earlier, budgetary allocations to the PRC power sector are modest—the budget contributes less than 5% of the funding requirements for fixed investment in this sector, and there is no budgetary support for operating expenses of service providers in the sector. Therefore, are end-user charges high enough to cover the full cost of investing in—and maintaining—the assets in this sector, or are consumers enjoying some degree of an off-budget hidden subsidy?

There is evidence to suggest that the full burden of development and maintenance is not absorbed by consumers. All tariffs are determined by the National Development and Reform Commission (NDRC), with input from local price bureaus and subnational planning authorities. NDRC tries to balance various competing interests in the tariff-setting process, but end-user tariffs have not kept pace with the recent escalation of the cost of coal (Figure 6). This implies that end users of electricity in the PRC do enjoy some level of hidden subsidy.

---

21 Our calculation of the simple average electricity price in selected provinces in cents per kilowatt-hour (Table 9) is marginally lower than the International Energy Agency’s calculation (Figure 5).
Figure 5: Electricity Prices for Households, 2005
($ per kilowatt-hour)

- Kazakhstan: 0.061
- People's Republic of China: 0.061
- Canada\(^a\): 0.068
- Norway: 0.071
- Taipei, China: 0.079
- Republic of Korea: 0.089
- Brazil\(^a\): 0.093
- United States: 0.095
- Mexico: 0.097
- France: 0.142
- United Kingdom: 0.149
- Japan: 0.189
- Germany\(^a\): 0.198

\(^a\) 2004 data.


Figure 6: Coal and Electricity Price Growth
(index of nationwide averages, January 2002 = 100)

Pinpointing how rents are allocated across the electricity value chain is not easy. However, it seems that PRC coal mining companies and power plants are self-financing and earning a reasonable return. Given that coal prices are largely deregulated (except in rare circumstances such as the periods of shortage in 2004 and 2007), and the price to grid suppliers is fixed on a cost-plus basis, coal-mining and power-generation companies are able to achieve returns on equity that are reasonable (Table 7).

<table>
<thead>
<tr>
<th>Company</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal Mining</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China Shenhua Energy Company</td>
<td>54.3</td>
<td>61.5</td>
<td>30.5</td>
<td>29.5</td>
</tr>
<tr>
<td>China Coal Energy Company</td>
<td>NA</td>
<td>171.3</td>
<td>80.7</td>
<td>25.4</td>
</tr>
<tr>
<td>Yanzhou Coal Mining Company</td>
<td>NA</td>
<td>NA</td>
<td>12.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Power Generation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China Power Investment Corporation</td>
<td>12.2</td>
<td>9.7</td>
<td>8.8</td>
<td>5.3</td>
</tr>
<tr>
<td>China Resource Power Holdings</td>
<td>13.4</td>
<td>18.4</td>
<td>18.2</td>
<td>21.7</td>
</tr>
<tr>
<td>Datang International Power Generation Company</td>
<td>14.6</td>
<td>13.7</td>
<td>15.2</td>
<td>15.8</td>
</tr>
<tr>
<td>Huadian Power International Corporation</td>
<td>11.0</td>
<td>10.8</td>
<td>9.5</td>
<td>9.1</td>
</tr>
<tr>
<td>Huaneng Power International</td>
<td>15.7</td>
<td>13.4</td>
<td>15.2</td>
<td>14.3</td>
</tr>
<tr>
<td>China Yangtze Power Company</td>
<td>15.3</td>
<td>15.2</td>
<td>13.7</td>
<td>17.4</td>
</tr>
<tr>
<td>SDIC Huanjing Power Holdings Company</td>
<td>NA</td>
<td>NA</td>
<td>31.0</td>
<td>18.2</td>
</tr>
</tbody>
</table>

NA = not applicable, SDIC = China State Development & Investment Corporation.

Table 7: Return on Equity for the People’s Republic of China’s Publicly Traded Coal and Power Companies (%)

The shock absorption seems to be provided by the as-yet unbundled transmission and distribution segment of the value chain. Unlike the coal mining and power generation segments—where the number and type of participants has been allowed to proliferate over the years—the government has reasserted centralized control over transmission and distribution by creating two giant national utilities. The State Grid Corporation of China and the China Southern Power Grid Corporation are the only buyers of electricity from power-generation companies and are the only distributors of electricity across the entire country. Moreover, since 1998, the central government

---

22 All of these companies have coal-fired plants; hence, their operating profits are impacted by coal prices. Coal companies’ returns have been very high in recent years as coal prices have risen, while profits of power-generation companies may have been squeezed (Table 7). In late 2007, with inflation rising sharply, the government implemented price controls, freezing electricity prices. This led to coal companies curtailing supply to power generators, which, in turn, led to power outages.

23 The top five power generators have been raising their generation capacity by 10% per annum and financing it by retained earnings, corporate AAA-rated bonds, and by raising equity from the stock market. Besides these companies, the profitability of the 30 listed companies under provincial governments also seems reasonable, and their returns on assets are in a similar range to the big five (Table A.2).
has been increasing investment in the grid and distribution systems to overcome bottlenecks created by the rapid pace of expansion in generating capacity and has been funding the renewal of the rural electrification grid.

The financial situation of grid companies is unclear. Grid company revenues are not commensurate with published rate tables and end-user tariffs. This is due to rebates to, or nonpayment from, end users (Rosen and Houser 2007). Also, given the cost-plus pricing structures for generators and end-user tariffs fixed by NDRC, the effective tariffs received by the grid companies are residuals. According to one source, in 2002, power-generation companies received about 66% and grid companies 34% of total revenues from end users, which did not leave enough revenue to allow grid companies to fund system expansion from retained earnings (SERC 2007). At 4% of revenues, the profitability of the transmission and distribution segment is the lowest of all segments of the electricity value chain (Figure 7). It is likely that the returns on equity to this segment are therefore, also depressed and lower than what a commercially motivated investor might expect.

In summary, the structure of the PRC power sector has evolved in a manner that has a distinct pro-generation and pro-coal mining bias. These two segments of the value chain now seem to operate largely on commercial terms, receiving a market (or close to market) price in the case of coal, or a cost-plus price in the case of generators. However, end users are still not bearing the full burden of costs involved in developing and maintaining the electricity value chain, as they still benefit from an implicit subsidy. The burden of providing this subsidy is not carried in full by the state budget, as budgetary contributions to the sector are intended only for fixed investment in the sector. In effect, government support is limited to providing a capital subsidy. The balance costs that are not passed on to the end user are absorbed largely by a central government-owned transmission and distribution system. Although these costs are not severe enough to cause operating losses in the grid companies, they appear

Figure 7: Electricity Value Chain
(2006 revenue and/or earnings before tax profit margin)

<table>
<thead>
<tr>
<th>Coal Mining ($89 billion or 9.6%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shenhua Group – 203 million tons</td>
</tr>
<tr>
<td>China National – 101 million tons</td>
</tr>
<tr>
<td>Datong Coal – 62 million tons</td>
</tr>
<tr>
<td>Others – 2,014 million tons</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Generation ($98 billion or 11.8%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huaneng – 282 billion kWh</td>
</tr>
<tr>
<td>Datang – 260 billion kWh</td>
</tr>
<tr>
<td>Guodian – 226 billion kWh</td>
</tr>
<tr>
<td>Huadian – 200 billion kWh</td>
</tr>
<tr>
<td>CPI – 168 billion kWh</td>
</tr>
<tr>
<td>Others – 1,694 billion kWh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmission ($163 billion or 4%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Grid Corporation 1,710 billion kWh</td>
</tr>
<tr>
<td>China Southern Power Grid 397 billion kWh</td>
</tr>
<tr>
<td>Other transmission and local consumption – 727 billion kWh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 million tons</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,834 billion kWh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>319 billion kWh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 billion kWh</td>
</tr>
</tbody>
</table>

| Hydro |
| 378 billion kWh |

| Nuclear |
| 53 billion kWh |

| Wind |
| 3 billion kWh |

| Imports |
| 4 billion kWh |

| Exports |
| 12 billion kWh |


to depress the earnings of these companies and force them to accept less-than-commercial returns on the equity invested in them.

User charges do not provide full cost recovery. The burden of the resulting subsidy must be shared among the grant provider (the government), equity providers, and debt providers. The debt is fully serviced, so banks are not really providing subsidy. The equity-financing portion is split into three components, corresponding to the three segments of the electricity value chain. Equity from the coal mining and power generation sectors is largely in the form of retained earnings and third-party investments. This equity is getting an adequate return, so it is not bearing any subsidy burden. The grant component from the government budget, financed from taxes, does defray some of the subsidy cost, but its contribution is limited to a relatively modest capital subsidy. Thus, the residual cost of the implicit subsidy to end users is borne by the equity of the grid companies, not in the form of losses, but in the form of depressed returns.

A Closer Look at Financing of Roads

Expansion of the Road Network

In terms of sheer pace of growth, the expansion of the PRC road network has not been as torrid as that of its power-generation capacity. The PRC doubled the size of its road network (above village level) from 940,000 kilometers (km) in 1985 to almost 1.9 million km in 2004 (Table 8). Of this, the share of “standard” roads grew from 64% to 82%. By 2006, the PRC had over 1.5 million km of village roads, 24 or a total road network of 3.4 million km. Of this network, about 133,000 km—or less than 4%—was classified as national roads; 7% as provincial; and 89% as county, township, or village roads. Of the total network in 2006, 44% was paved (Tables A.3–A.5).

In recent years, the PRC has launched ambitious plans to build a national highway network. Since 1995, 40,000 km of expressways and 35,000 km of class I highways have been built as part of the National Trunk Highway System (NTHS) and National Expressway Network (NEN).

Table 8: Development of Road Infrastructure in the People’s Republic of China (*000 km)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Expressways</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
<th>Below Class IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>942.5</td>
<td>NA</td>
<td>0.4</td>
<td>21.3</td>
<td>128.5</td>
<td>456.3</td>
<td>336.0</td>
</tr>
<tr>
<td>1990</td>
<td>1,028.3</td>
<td>0.5</td>
<td>2.6</td>
<td>43.4</td>
<td>169.8</td>
<td>524.8</td>
<td>287.2</td>
</tr>
<tr>
<td>1995</td>
<td>1,156.9</td>
<td>2.1</td>
<td>9.6</td>
<td>84.9</td>
<td>207.3</td>
<td>606.8</td>
<td>246.2</td>
</tr>
<tr>
<td>2000</td>
<td>1,402.8</td>
<td>16.3</td>
<td>20.1</td>
<td>152.7</td>
<td>276.7</td>
<td>750.3</td>
<td>186.7</td>
</tr>
<tr>
<td>2004</td>
<td>1,870.5</td>
<td>34.3</td>
<td>33.5</td>
<td>231.7</td>
<td>335.3</td>
<td>880.9</td>
<td>354.8</td>
</tr>
<tr>
<td>2005</td>
<td>3,345.2</td>
<td>41.0</td>
<td>41.7</td>
<td>248.1</td>
<td>347.2</td>
<td>1,461.9</td>
<td>1,205.3</td>
</tr>
<tr>
<td>2006</td>
<td>3,457.0</td>
<td>45.3</td>
<td>45.3</td>
<td>262.7</td>
<td>354.7</td>
<td>1,574.8</td>
<td>1,174.1</td>
</tr>
</tbody>
</table>

km = kilometer, NA = not applicable.
Sources: Ministry of Communications 2006; Li 2005.

24 Data on the PRC’s village road network before 2005 are not available.
Interestingly, even for the development of national roads—including roads under NTHS and NEN—the role of the Ministry of Communications, which is the central government ministry in charge of road development, is restricted to planning and management. Construction and maintenance is the responsibility of subnational governments. The ministry sets the alignment and technical specifications of classified roads and administers the NTHS and NEN fund, which is financed by the car purchase tax, a 10% levy applied by the central government on the purchase of all new vehicles. Budgetary contributions from the central government toward road construction are not much larger than the proceeds collected from the car purchase tax. These contributions are delivered to subnational governments as a capital subsidy for the construction of national roads, especially those under the NTHS and NEN plans.

It is our understanding that only expressways and class I and II roads are tolled. In other words, not much more than 10%–15% of the overall road network of the country is tolled. There does not seem to be any formulaic approach to tolling that is applied uniformly across the country. Tolls are fixed at the provincial level, specifically by the provincial pricing bureaus, but following consultations with the Ministry of Communications.

There does not seem to be any provision for automatic inflation-linked adjustment of tolls. There are two types of schemes for tolling. Under the first, tolls are set just to cover the cost of debt servicing—once the debt is paid off, the tolls cease to apply. This scheme applies to expressways and/or other classified roads that are built by provincial state-owned construction companies.

The second scheme provides for tolls that allow commercial operation of the underlying road assets. This applies to road concessions (typically for 25–30 years) awarded on a build–operate–transfer basis to private (including some foreign) investors. Toll rates that apply in such cases are high enough to cover debt-servicing costs, but also to allow the operator to recover a reasonable return on their overall investment, including the capital cost of development.

There is no uniform national approach to how build–operate–transfer projects are awarded, although the system is moving toward more transparent bidding. Provincial communications departments—the subnational equivalent of the Ministry of Communications—typically accept financial and construction risks for new road projects through state-owned construction companies. When traffic levels begin to mature, generally over 3–5 years, the operating rights of these expressways are sold by the provincial communications departments to private operators, or the assets are securitized in capital markets to provide funding for new construction (Myers 2007). A small group of developers from Hong Kong, China have bought road concessions of existing expressways and highways. Some of the concessions were awarded in the 1990s in Guangdong Province, and then later in Anhui Province (Box 5).

Direct bank financing is available for road development, but is restricted to projects where there is a formal tolling arrangement. Such stretches of road are, in fact, coveted assets for banks. Typically, domestic banks follow the People’s Bank of China’s unwritten rule that loans may constitute no more than 65% of construction costs, and 35% must be in the form of up-front capital. Generally, an expressway or class I or II road with a formal tolling arrangement would be funded as follows: 10%–20% of the project costs from the central government in the form of a grant; 15%–25% of project costs through an equity contribution from a provincial-level state-owned construction company; and the remaining 65% in the form of bank debt, secured against project cash flows.
Box 5: Road King Infrastructure Limited

Road King Infrastructure Limited is one of the leading highway investors and developers in the People’s Republic of China (PRC). Its core business is in the investment, development, operation, and management of toll roads and property projects in the PRC. It has a toll road portfolio of HK$6 billion (US$780 million), comprising 19 toll road and bridge projects spanning approximately 1,000 kilometers in eight PRC provinces. The company has expressways as well as class I and II highways in its road portfolio. The toll road business contributes stable cash flow and profit to the group. The average daily traffic and toll revenue has shown a healthy increase in toll revenues since 2002. To enhance the performance and management of the toll road business, the group has disposed and/or shuffled the portfolio of its road projects.

Annual Average Daily Traffic and Annual Toll Revenue (in CNY million)

Source: Road King Infrastructure Limited, various issues.
Additional bank financing is available to the sector through provincial construction and/or development companies, which may be able to borrow against their own corporate balance sheets, and supplementary collateral such as the future value of land being developed in a particular project (Box 3).

With limited support from the central government and the limited footprint of commercial tolling, local governments have had to rely heavily on extrabudgetary means to finance road development. Provinces have turned to pooling arrangements, whereby they levy tolls on a network of classified provincial roads to cross-subsidize other provincial road development. In effect, these tolls are in the nature of off-budget capital levies that finance dedicated road development funds at the provincial level.

Local governments, right down to the village level, are authorized to charge road maintenance fees (that are distinct from tolls) to cover the operation and maintenance of the road network under their care. Such fees are collected by dedicated agencies allowed to deploy the funds only for operation and maintenance, and they do not form part of the local government budget.

Local governments have also made effective use of their land assets to generate revenues for road development. Not only have sale of land-use rights in the form of long-term leases been used to generate revenue for development purposes, but they are also used as collateral for raising debt at the level of the local project company (Box 3).

**The Road Financing Chain**

Figure 8 summarizes the financing chain for the PRC road sector. Unlike the case of power, user charges cover a much smaller share of the full cost of developing and maintaining the country's road network. As noted earlier, tolls are applied on only 10%-15% of the road network, and most are not designed to cover the cost of capital, only that of debt servicing. Although local governments are allowed to recover maintenance costs through extrabudgetary fees, there is still a substantial implicit subsidy that the road consumer enjoys, relative to an electricity consumer. This is, indeed, as it should be and is similar to the experience elsewhere in the world. Roads, by their nature, have more of a public-good character than electricity.

How is this road subsidy financed? As in the case of the power sector, bank debt is being fully serviced. Banks are not funding the implicit subsidy to end users of roads. Likewise, the small number of private and foreign equity providers in the road sector seem to enjoy a commercial return, and are therefore not carrying the burden of the implicit subsidy.

Some of the cost of the subsidy is borne by the state budget. Compared to the power sector, budgetary contributions account for double the share of the road sector’s funding requirements. Yet this grant component is still only 10% of funding requirements and is delivered only in the form of a capital subsidy.

The bulk of the burden of the implicit subsidy to end users falls on providers of self-raised funds. Unlike in the power sector where these funds comprise largely retained earnings of commercially oriented power-generation and coal mining companies, in the case of roads, retained earnings are a modest component of self-raised funds. These

---

25 There is some evidence to suggest that part of the PRC banking system, notably the China Development Bank, has absorbed losses on account of lending to infrastructure projects in non-coastal states. But the losses do not seem to be very extensive.
Some Comparisons to India

To contrast the PRC's experience in infrastructure financing with that of India, we have, in Figure 9, attempted to construct the equivalent schematic for India as we did for the PRC in Figure 2. Several noteworthy points emerge. First, effective user charges for infrastructure services are much lower in India than they are in the PRC. Hence, the subsidy to users of infrastructure services in India is significantly higher than in the PRC. The most pertinent example is that of the power sector. Although the weighted average tarrifs are similar, the effective electricity tariff in the PRC is an estimated 5.9 cents per kilowatt-hour (kWh) versus 4.0 cents per kWh in India. This results in an estimated $1.3 billion in implicit subsidy to end users in India. Effective user charges are rebated and noncollection, adjusted for rebates and noncollection, and are much lower in India than they are in the PRC.

FDI = foreign direct investment.

Sources: Ministry of Communications 2006 and 2008.
In fact, the differential in the subsidy is likely to be even larger, because our hypothesis is that the electricity chain in the PRC is more efficient than its counterpart in India.26 Second, at 43%, the share of budgetary contributions—the grant component in the infrastructure financing chain—is more than 2.5 times higher in India than in the PRC. This is a corollary to the fact that the subsidy enjoyed by the end user of infrastructure services in India is much higher than that given to a counterpart in the PRC. Providers of infrastructure services in the PRC do not run any meaningful operating losses, as operation and maintenance expenses are recovered through nonbudgetary levies and surcharges applied at different levels of government. Budgetary allocations to the sector are then delivered as a capital subsidy toward fixed investment in the sector. In India, again taking power as an example, infrastructure service providers are running large operating losses. Only a part of budgetary allocations are used for capacity expansion, and the rest is used to fund operating losses of state-owned service providers.

Third, India is much more dependent on foreign debt financing for its infrastructure sector than the PRC. On the other hand, the PRC has managed to attract FDI to fund a greater share of its infrastructure financing requirements than India—2% versus virtually zero. The PRC also had greater success in tapping equity markets for infrastructure financing—third-party equity funding as a share of total sector financing requirements was 6% in the PRC compared with an estimated 1% in India. In both countries, little of the burden of the subsidy to end users is borne by providers of debt or of third-party equity capital.27

Fourth, there is no equivalent in India of the funding source that is local governments’ extrabudgetary revenues deployed as equity in PRC infrastructure projects.

---

26 In terms of number of units of electricity produced per unit of coal.
27 See footnote 25.
This makes the equity portion of the financing structure much larger (relative to the grant and debt portion) in the PRC than in India—54% of the sector’s funding was in the form of equity in the PRC versus 21% in India. Despite this, the average return to equity providers in India does not seem much higher than in the PRC. However, there is a large variation in equity returns across type of investor in India—private investors tend to enjoy a significantly higher rate of return than their state-owned counterparts (Table 10).

<table>
<thead>
<tr>
<th>Table 9: Effective Electricity Tariff, 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>People’s Republic of China</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Average Tariff (cents/kWh)</td>
</tr>
<tr>
<td>Consumption (% share)</td>
</tr>
<tr>
<td>Weighted Average Tariff</td>
</tr>
<tr>
<td>Effective Tariff</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Domestic</td>
</tr>
<tr>
<td>5.7</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>0.6</td>
</tr>
<tr>
<td>6.2</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>1.6</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Commercial</td>
</tr>
<tr>
<td>9.0</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>1.4</td>
</tr>
<tr>
<td>11.7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>0.9</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Agriculture or irrigation</td>
</tr>
<tr>
<td>5.0</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>0.2</td>
</tr>
<tr>
<td>1.5</td>
</tr>
<tr>
<td>24</td>
</tr>
<tr>
<td>0.4</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Industrial</td>
</tr>
<tr>
<td>5.9</td>
</tr>
<tr>
<td>71</td>
</tr>
<tr>
<td>4.2</td>
</tr>
<tr>
<td>9.0</td>
</tr>
<tr>
<td>35</td>
</tr>
<tr>
<td>3.2</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
returns to their equity contributions. In India, however, the burden of the subsidy is concentrated on the consolidated government budget and on the equity contribution of a small class of state-owned infrastructure service providers, such as the state-owned distribution companies and provincial power-generation companies that are running significant operating losses.

In essence, in the PRC, the subsidy implicit in the infrastructure financing chain is intended more to incentivize the creation of new capacity than to protect the end user. In India, the subsidy is intended to please end users of infrastructure services, cover up the inefficiencies and operating losses of state-owned service providers, and safeguard superior returns to the equity of private investors.

**Institutional Arrangements**

The PRC has been able to raise the level and quality of its infrastructure services. Besides extending infrastructure facilities more widely, it has executed large, complex, and quality infrastructure projects in record time. In this section, we examine key aspects of the PRC’s institutional arrangements that have enabled this action.

**Different Nature of Public Sector Enterprises**

Infrastructure service provision is currently dominated by government departments and SOEs (both at the central and subnational level) in the PRC as well as in India. Why are government agencies and public enterprises in the PRC more successful? Their profitability and returns are reasonable, their implementation ability seems better, and they are more dynamic. There are many instances where they seem to be “pushing the envelope” to achieve their goals. In fact, decentralization led to hectic infrastructure building by local governments and their enterprises to the extent that sometimes overcapacity was created. In India, while there are some well-performing public sector undertakings in infrastructure, they are outnumbered by weak, run-down public utilities whose overall performance is far behind those in the private sector and counterparts in the PRC.

A key difference is that in India, public sector undertakings and bureaucracy operate in a framework that does not encourage risk taking. Indeed, doing nothing is better than doing something wrong. The apparatus of the Central Vigilance Commission, the Comptroller and Auditor General of India, and parliamentary oversight, together with the absence of an appropriate incentive system, has restricted entrepreneurial initiatives in public sector undertakings and bureaucracy more generally.

Second, governments in a representative democracy such as India are subject to populist pressures. Thus, there is a tendency for public sector undertakings (such as railways and water utilities) to become overstaffed and vehicles for political patronage rather than effective suppliers of services to the general public.

In contrast, PRC SOEs are actively encouraged to deliver results that need not always be measured in financial terms and to take risks. The nature of political intervention is also different. The Communist Party of China drives the economic agenda and uses the bureaucracy to deliver results. So, although the PRC has powerful energy firms, the government influences development through informal channels by appointing the senior-most executive leadership of these firms. The Ministry of Personnel,
which has the power of appointment and dismissal, is fully aligned with the interests and politics of the Communist Party (Rosen and Houser 2007). The heads of enterprises, who are mostly industry professionals, also view their posts as stepping-stones to powerful government positions. While the party can shape industry by making industry leadership into political positions (i.e., the chairpersons of some of the largest energy companies hold ranks of vice-minister), the system also provides industry with a seat at the table in shaping policy (Rosen and Houser 2007).

Thus, the character of public sector organizations in the PRC and India is quite different. In the PRC, incentives between the government and bureaucracy—and by extension, the management of SOEs—seem aligned. The politicization of the government machinery is effective for delivering results. In India, the relationship between government and bureaucracy seems more contentious. The politicization of the bureaucracy is, in fact, a corrosive phenomenon that undermines professionalism and performance.

**Need for Independent Regulation: Myth or Reality?**

Except for the power sector for which the State Electricity Regulatory Commission (SERC) was set up, the central government has not established a separate regulatory authority for any other infrastructure subsector (Figure 10). In the case of highways, ports, and airports, important development and allocative functions are carried out by NDRC. Operational control of civil aviation remains with the Civil Aviation Authority of China and regulation of telecommunications is with the Ministry of Industry and Information Technology.

Even in the case of electricity where there is a newly created regulatory body, its effectiveness is unclear. The SERC’s functions are to promote and supervise market competition and to issue licenses to operators in the power industry. The commission is also responsible for developing and implementing electricity reforms (OECD 2005). However, it is not a very powerful body. NDRC plans and approves energy projects and is responsible for tariff regulation, including electricity tariffs as well as gasoline, diesel, and natural gas pricing; sets industrial policy affecting the country’s energy-intensive firms; and determines energy-efficiency targets (Rosen and Houser 2007). Other ministries are also involved—the Ministry of Land and Resources deals with resource extraction licensing and the Ministry of Commerce oversees energy import and export licenses. The Ministry of Finance has some decision-making powers relating to certain financial rules and cost standards, and the State-Owned Assets Supervision and Administration Commission exercises a supervisory role over SOEs (SERC 2007).

India, on the other hand, has separate regulatory bodies for telecommunications, ports, and power, and is in the process of establishing bodies for petroleum and natural gas, coal, and airports. For the power sector, because it is a concurrent center-state subject, it has a national regulatory agency, the Central Electricity Regulatory Commission, as well as state-level agencies. In the case of ports, the Tariff Authority for Major Ports was set up.

In India, the approach of relying on public financing of infrastructure has not delivered satisfactory results. The government has, therefore, decided to move toward greater private sector participation. Involvement of private players with a profit motive, operating in sectors in which the rational industry structure is a monopoly or a duopoly, necessitates regulation to protect the public interest. Regulation also becomes essential because private players need to be reassured that there is a level playing
Figure 10: People’s Republic of China—Regulatory and Institutional Arrangements in the Infrastructure Sector

Central Party Committee sets policy direction, and undertakes long- and medium-term planning. National People’s Congress approves plans and mega-projects. The State Council formulates policy with the help of DRCs.

National Development and Reform Commission formulates and implements plan/policy, coordinates across sectors and levels of government, and guides and approves projects.

Power

SERC

Cost recovery principle for each generator, consumer tariff set by NDRC

Port allocation plan by centre

Market determined

Provincial price bureaus and approved by NDRC

Cost recovery principle for expressways set by provincial bureaus as per NDRC rules

Decided by MOR, approved by NDRC and MOF

MII

CAA = Civil Aviation Authority of China, DRC = Development Research Center of the State Council, MII = Ministry of Industry and Information Technology, MOF = Ministry of Finance, MOR = Ministry of Railways, NDRC = National Development and Reform Commission, SERC = State Electricity Regulatory Commission.

Source: Authors.

Figure 11: India—Regulatory and Institutional Arrangements in the Infrastructure Sector

Long- and medium-term planning by Planning Commission (Central Government)

Line ministries formulate and implement plan and/or policy, no direct central coordinating agency across sectors and levels of government, indirectly done by the Planning Commission

Power

CERC and SERC

Consumer tariff set by SERC

Ports

Ministry of Shipping

Tariff authority for major ports and state maritime boards for minor ports

Airports

Ministry of Civil Aviation

Ministry of Civil Aviation

Roads

Fixed by NHAI for all NHs and state govt.’s for SHs

Railways

Ministry of Railways

Decided by MOR, approved by Parliament

Telecom

TRAI

TRAI

CERC = Central Electricity Regulatory Commission, MOR = Ministry of Railways, NH = national highway, NHAI = National Highways Authority of India, SERC = State Electricity Regulatory Commission, SH = state highway, TRAI = Telecom Regulatory Authority of India.

Source: Authors.
field vis-à-vis not only incumbent government enterprises but also other private players. Transparency and predictability of the rules are needed for the private sector to be willing to invest in infrastructure, as well as an independent regulatory authority. In particular, tariff setting and collection needs to be distanced from political influence. Confidence in the regulator is essential for impartially adjudicating potential conflicts.

The PRC has been able to function without independent regulators because it has had no compulsion to bring in the private sector. With the public sector, in hybrid forms, dominating the infrastructure space, there has been less of a need to have a separate regulator to adjudicate conflicts. So far, the government has been able to balance the need for infrastructure investment with the political sensitivities of setting tariffs and subsidies, without destroying the commercial basis of its infrastructure service providers. However, as SOEs become more commercially oriented (as in the case of power generation and coal mining) and as an increasing number of private players enter the infrastructure space (as in the case of roads), the need for independent regulation will grow. Eventually, the country will need a mechanism to protect the interest of consumers from those of the government and its enterprises.

Coordination and Implementation

A Unique Experience in the People’s Republic of China

Interjurisdictional and interministerial coordination is crucial in executing infrastructure projects. In this context, the role of NDRC is paramount in the PRC. Planning in the PRC is an iterative, detailed, bottom-up process. Plans serve as blueprints for the development of each region and are prepared by NDRC in consultation with subnational levels of government. So, for example, if a port is to be built, the planning process provides for the coordinated development—with appropriate involvement of all concerned organs of bureaucracy—of ancillary infrastructure, such as rail and road access.

Beyond its strategy, planning, and policy formulation role, NDRC also coordinates implementation of the plans. Since several line ministries, institutions, and lower-level governments are involved, providing a leadership role in implementation is essential. NDRC also visits local areas and carries out field investigations when issues arise or as part of monitoring implementation (Liu 2004). To implement the plan for the power sector, for example, NDRC would coordinate with relevant central government agencies and local administrations to site new plants; determine equipment manufacturers, fuel types, and suppliers; arrange for construction; facilitate all necessary approvals; and allocate to a power-sector enterprise. This role, which combines top-down guidance with a troubleshooting, coordination, and a clearinghouse function, has greatly enhanced execution capacity. Arguably, it is what underlies the PRC’s ability to deal with complex cross-jurisdictional infrastructure initiatives effectively (ADB, JBIC, World Bank 2005).

This is not to say that there are no problems. The planning process for infrastructure development has not been able to prevent situations of periodic excess supply followed by acute shortages. This has been particularly the case with the country’s power sector, where it has been argued that the problem lies with the mismatch in the extent of price deregulation in different parts of the electricity value chain. Thus, allowing cost-plus pricing for power generation—while retaining strict control over the
end-user prices charged by the transmission and distribution companies—meant that the growth in generating capacity got ahead of investment in transmission and distribution networks, leading to bottlenecks in meeting consumer demand for electricity (Ni Chun 2006). Another case in point is power outages resulting from coal prices being subjected to ad hoc price controls.28

The PRC does have another coordination problem, but its nature is very different from the coordination problems of India. Whereas in India, lack of coordination leads to execution gridlock, in the PRC, the same leads to excess capacity. There has been traditional tension between the forces of centralization and decentralization in the PRC. Overinvestment by enthusiastic local governments is a repetitive phenomenon that is responsible for the PRC’s macroeconomic cycles of periodic overheating, followed by a glut. In the most recent episode of overheating, unnerved by power shortages in 2002–2003, local governments invested heavily in power-generation capacity. They doubled this capacity in the space of 5 years, from 2002 to 2007, but an estimated 20%–25% of the installed capacity was “illegal” in the sense that these power plants were not part of the planning process and did not receive central government approval. These plants may not conform to national building standards and may have to remain idle for some time on account of insufficient transmission and distribution capacity to evacuate the power that they generate (Lester and Steinfeld 2006).

Execution Gridlock, Indian-Style
Planning and implementation has turned out to be woefully inadequate in India. As an example, the addition of power capacity has lagged far behind the targets set in successive 5-year plans. In the last three plans, the shortfall has consistently been around 50% (Table 11). The actual installation of new power-generation capacity has been barely 3.5 gigawatt on average a year (of which only 2.5 gigawatt of thermal capacity has been added yearly), so one cannot say that the plan targets are too ambitious. There are many reasons cited for the shortfall, such as delays due to land acquisition and environment clearances, equipment availability, and a pipeline of projects not being ready—but in reality, it comes back to the issue of inadequate planning and coordination.

The political dimension plays an important role in exacerbating the difficulties of coordination and implementation in India. The interplay between a federal constitutional structure and a multiparty system, in which coalition governments at the center need to coexist with opposition parties in various states, accentuates a culture of noncooperation and confrontation.

India’s Planning Commission is unable to play the same coordinating role that NDRC so effectively discharges in the PRC. The cabinet system of government and weak coordination seem to have contributed to complex and dysfunctional interministerial interactions. As a result, decisions that require interministerial cooperation proceed at a slow pace, causing long delays in the implementation of infrastructure projects.

---

28 Severe disruption in power in the winter of 2007 was not due to shortage of generation capacity but price controls implemented in the second half of 2007, including on power, in an effort to ensure that inflation did not spread to the rest of the economy. Global coal prices, in the meantime, soared by 50%–60%, with the largest rise occurring in December 2007 and January 2008 due to flooding in Australia. Therefore, PRC coal companies did not supply coal to power generators at prices lower than world market prices.
The central government is increasingly using incentives to induce better performance and service delivery—for instance, it is providing financial support conditioned on improving the power distribution system (the Accelerated Power Development Reform Program)—but with uncertain results.

Access to Infrastructure

The PRC’s rapid economic growth has led to an uneven distribution of benefits. Although it has improved the quality of life for the poor overall, inequalities have widened between the rich and poor, between urban and rural populations, and between coastal and interior regions. The PRC has a mixed record in providing infrastructure facilities to a wide range of population. It has achieved nearly 99% access to electricity, and fairly high coverage of telecommunications (teledensity is 63.4 per 100 population against India’s 17.2 in 2006). Yet the road network to villages remains relatively poor. More seriously, it has fallen short of providing access to improved water supply and sanitation facilities for a large majority of the rural population. In what follows, we look more closely at access to electricity and roads, particularly in rural areas.

---

**Table 11: India: Power Capacity Addition during the Five-Year Plans, Actual versus Target (GW)**

<table>
<thead>
<tr>
<th></th>
<th>Eighth Five Year Plan</th>
<th></th>
<th>Ninth Five Year Plan</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Power</td>
<td>of which Thermal</td>
<td>Total Power</td>
<td>of which Thermal</td>
</tr>
<tr>
<td></td>
<td>Capacity Added</td>
<td></td>
<td>Capacity Added</td>
<td></td>
</tr>
<tr>
<td>Center</td>
<td>8.2</td>
<td>6.2</td>
<td>4.5</td>
<td>3.1</td>
</tr>
<tr>
<td>Actual to target (%)</td>
<td>64</td>
<td>74</td>
<td>38</td>
<td>41</td>
</tr>
<tr>
<td>State</td>
<td>6.8</td>
<td>6.0</td>
<td>9.4</td>
<td>5.5</td>
</tr>
<tr>
<td>Actual to target (%)</td>
<td>46</td>
<td>67</td>
<td>88</td>
<td>112</td>
</tr>
<tr>
<td>Private</td>
<td>1.4</td>
<td>1.2</td>
<td>5.1</td>
<td>4.9</td>
</tr>
<tr>
<td>Actual to target (%)</td>
<td>50</td>
<td>46</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td>16.4</td>
<td>13.4</td>
<td>19.0</td>
<td>13.5</td>
</tr>
<tr>
<td>Actual to target (%)</td>
<td>54</td>
<td>67</td>
<td>47</td>
<td>46</td>
</tr>
</tbody>
</table>

GW = gigawatt.


---

The gap in mobile teledensity is, however, narrowing rapidly.

Access to piped water is not available to two-thirds of the rural population and access to improved sanitation services was lacking, especially in rural areas, in 1998 (ADB, JBIC, and World Bank 2005).
Rural Electrification in the People’s Republic of China: A Qualified Success

Notwithstanding the government’s pro-urban bias, the PRC has achieved almost universal household access to electricity. The number of people with no access to electricity was reduced from 245 million in 1979 to about 20 million—less than 2% of the population—by 2002. A substantial expansion of rural electrification made this possible (Table 12). In 20 years, from 1978 to 1998, the share of electricity consumption at county or lower levels increased from 13.3% to 40.5%. The most rapid increase was in 1987–1998, when rural electricity generation tripled (Table 12).

Table 12: Rural Electricity Development, 1987–2002

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Capacity</td>
<td>MW</td>
<td>%</td>
<td>MW</td>
<td>%</td>
<td>MW</td>
</tr>
<tr>
<td>Total</td>
<td>15,930</td>
<td>100</td>
<td>32,090</td>
<td>100</td>
<td>44,150</td>
</tr>
<tr>
<td>Small hydro</td>
<td>10,660</td>
<td>67</td>
<td>15,770</td>
<td>49</td>
<td>21,080</td>
</tr>
<tr>
<td>Small thermal</td>
<td>2,330</td>
<td>15</td>
<td>8,180</td>
<td>25</td>
<td>14,790</td>
</tr>
<tr>
<td>Diesel</td>
<td>2,900</td>
<td>18</td>
<td>8,060</td>
<td>25</td>
<td>7,960</td>
</tr>
<tr>
<td>Renewable</td>
<td>40</td>
<td>0</td>
<td>80</td>
<td>0</td>
<td>320</td>
</tr>
<tr>
<td>Rural Generation</td>
<td>TWh</td>
<td>%</td>
<td>TWh</td>
<td>%</td>
<td>TWh</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
<td>99</td>
<td>100</td>
<td>132</td>
</tr>
<tr>
<td>Small hydro</td>
<td>28</td>
<td>69</td>
<td>54</td>
<td>55</td>
<td>65</td>
</tr>
<tr>
<td>Small thermal</td>
<td>10</td>
<td>25</td>
<td>38</td>
<td>38</td>
<td>60</td>
</tr>
<tr>
<td>Diesel</td>
<td>2</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Renewable</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

MW = megawatt, NA = not applicable, TWh = terawatt-hour.
Note: Total figures for 2000 comprise small hydro, small thermal, and diesel only.

The partial decentralization of responsibility for investment and operation of the electricity system in the mid-1980s gave a major boost to rural electrification. Before 1979, the central government had largely ignored the development of rural electricity supply as it focused on providing power to meet the needs of industrialization. Whatever little capacity was built during the pre-reform period was by county communes and villages. However, they were able to develop only small and mostly hydro local power stations, which were unreliable due to seasonality, not connected to major grids, and were inefficient with high line losses. In the mid-1980s, when local governments were empowered to build power plants and tariffs were adjusted, they expanded the small thermal facilities in rural areas to meet the growing demand from township and village enterprises. Thus, even in rural areas, the provision of electricity was driven by industrial, not household, demand. Only about 18% of the rural electricity generated was for residential use as of 2002, whereas as much as 64% was for industry (Table 13).
The unprecedented acceleration of urbanization from the mid-1990s also led to increased household access to electricity. In the PRC, the share of its urban population in total rose from 27% in 1991 to 38% in 2001, whereas in India the share of urban population barely grew from 26% to 28% over the same period. Since 2001, urbanization has continued at a rapid pace in the PRC, with an estimated urban population of 44% in 2006.

The central government introduced several programs in the 1990s to expand rural electrification. In the aftermath of the Asian financial crisis in 1998, it became apparent that the excess supply of electricity in urban areas could not be transmitted to rural areas because of its lack of rural connectivity to the grid. The center’s main contribution was the integration of the electricity systems. From the second half of 1998, the PRC began to implement a rural grid renovation program, which not only connected rural supply systems to the grid but also reduced rural line losses to less than 10%–15%. The costs were covered in the national electricity tariff, and a unified tariff for urban and rural residents was established. It is estimated that by 2002, almost 80% of rural electricity consumption was from the national power grid, with the rest generated locally (Peng and Pan 2006).

Rural Electrification in India: A Story of Failure

India, on the other hand, has not been as successful in providing its population access to electricity, particularly in rural areas. Despite a strong political push and rapid pace of rural electrification since the mid-1960s (Figure 12), India’s record today is astonishingly poor.

Table 13: Main Purpose of Rural Electricity Usage

<table>
<thead>
<tr>
<th>Year</th>
<th>Industry</th>
<th>Agriculture, Forest, Herd, Fishing, Water Resources, and Others</th>
<th>Residential Living</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (billion kWh)</td>
<td>County Level and Below (%)</td>
<td>Amount (billion kWh)</td>
</tr>
<tr>
<td>1993</td>
<td>174</td>
<td>59</td>
<td>69</td>
</tr>
<tr>
<td>1994</td>
<td>200</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>1995</td>
<td>225</td>
<td>60</td>
<td>82</td>
</tr>
<tr>
<td>1996</td>
<td>243</td>
<td>59</td>
<td>89</td>
</tr>
<tr>
<td>1997</td>
<td>254</td>
<td>58</td>
<td>97</td>
</tr>
<tr>
<td>1998</td>
<td>268</td>
<td>58</td>
<td>78</td>
</tr>
<tr>
<td>1999</td>
<td>293</td>
<td>59</td>
<td>104</td>
</tr>
<tr>
<td>2000</td>
<td>347</td>
<td>61</td>
<td>106</td>
</tr>
<tr>
<td>2001</td>
<td>387</td>
<td>62</td>
<td>118</td>
</tr>
<tr>
<td>2002</td>
<td>465</td>
<td>64</td>
<td>125</td>
</tr>
</tbody>
</table>

kWh = kilowatt-hour.

As of 31 March 2001 (the time of the last census), the number of villages with electricity was 474,982 or 81% out of a total of 587,258 villages. Before 2005, village electrification meant that electricity was available to farmers at the farm gate and not necessarily to rural households. Indeed, as Table 14 shows, only 43.5% of rural households had electricity in 2001.

Table 14: Household Access to Electricity in India

<table>
<thead>
<tr>
<th></th>
<th>All India</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households</td>
<td>53,692,376</td>
<td>138,271,559</td>
<td></td>
<td>191,963,935</td>
</tr>
<tr>
<td>Number of households with electricity</td>
<td>47,028,369</td>
<td>60,180,685</td>
<td>107,209,054</td>
<td></td>
</tr>
<tr>
<td>Percentage of households with electricity</td>
<td>87.59%</td>
<td>43.52%</td>
<td>55.85%</td>
<td></td>
</tr>
</tbody>
</table>


In India, rural electrification was driven by the need to power irrigation facilities. Emerging from the droughts of 1965–1966 and 1966–1967, the strategy shifted from constructing large-scale long gestation irrigation projects to groundwater-based irrigation relying on tube wells. The tube wells required pump sets to be powered, which necessitated the delivery of electricity to the farming sector (Lall and Rastogi 2007). Thus, agricultural production, not household demand, underpinned village electrification in India (just as in the PRC, it was industry, not households, that were targeted). Electricity to farms was not metered in India in the 1970s, so the financial burden on state electric utilities started mounting as the share of irrigation in power consumption grew to 24% (Table 15).
Table 15: Power Consumption in India by Category, 2003–2004 (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Urban</td>
<td>National</td>
<td>Rural</td>
<td>Urban</td>
<td>National</td>
<td>Rural</td>
</tr>
<tr>
<td>Domestic</td>
<td>12.6</td>
<td>10.7</td>
<td>8.8</td>
<td>11.2</td>
<td>14.2</td>
<td>15.2</td>
<td>10</td>
</tr>
<tr>
<td>Commercial</td>
<td>7.5</td>
<td>6.1</td>
<td>5.9</td>
<td>5.7</td>
<td>5.7</td>
<td>6.1</td>
<td>2</td>
</tr>
<tr>
<td>Irrigation</td>
<td>3.9</td>
<td>6.1</td>
<td>10.2</td>
<td>17.6</td>
<td>21.7</td>
<td>24.2</td>
<td>24</td>
</tr>
<tr>
<td>Industrial and others</td>
<td>74.0</td>
<td>77.2</td>
<td>75.1</td>
<td>65.5</td>
<td>58.4</td>
<td>54.5</td>
<td>15</td>
</tr>
<tr>
<td>of which Industrial</td>
<td>62.6</td>
<td>69.4</td>
<td>67.6</td>
<td>58.4</td>
<td>51.7</td>
<td>47.5</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>98.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>

NA = not available.

a Calendar year.


Unlike in the PRC where the government connected rural households to the grid, in India, the government did not go the last mile by taking electricity to the households in the village. Now, the Government of India’s goal is electricity for all by 2010.31 There is an important difference in the way the two countries went about providing rural electricity, which may explain their relative success. In the PRC, while the government provided grid connectivity to the rural areas, it charged rural households for electricity. In fact, rural residential consumers had to pay the same price as urban households. In India, political interference in rural infrastructure provision has had harmful results. Free electricity was extended to a privileged group of farmers and villagers,32 and metering was discontinued. State electricity boards started running heavy losses over the years, and the vast majority of the rural population was precluded from getting electricity as the boards had neither the resources nor interest in electrifying areas where their losses were doomed to rise. Budgetary resources are allocated to meet operating losses of these boards with no room left to provide the needed capital subsidy to extend electrification. Unfortunately, this vicious cycle has been difficult to reverse.

**Rural Roads**

The Government of PRC seemed to have neglected the development of rural roads until the early 2000s. In contrast to the remarkable development of expressways that grew at an average annual rate of 44% from 1988 to 2002, the length of low-quality, mostly rural roads increased by only 3% per year over the same period (Fan and Chan-Kang 2005). Rural roads (i.e., those below class IV) were only 34% of total

---

31 Accordingly, a new scheme for creation of rural electricity infrastructure and household electrification, **Rajiv Gandhi Grameen Vidyutikaran Yojana**, was launched in 2005. To address the concern of revenue sustainability, an important feature of this program is to put in place “franchisees” from and beyond a substation, feeder, or distribution transfer with complete contractual and commercial obligations.

32 Power is supplied intermittently to villagers at highly subsidized rates or at no cost, generally at off-peak hours.
road length in 2006 (Table 8). Lack of funds was a factor restricting the development of the rural highway program (Dong 2004). In recent years, however, the PRC has given a major push to rural road development.33

In India, on the other hand, substantial resources have been allocated to rural roads, driven by political compulsions of winning the rural vote (Figure 13 and Table 16). As a result, almost 80% of total road length now comprises other district and rural roads (Central Statistical Organization 2008). Of course, the quality of the roads is questionable. Often, earthen tracks and gravel roads do not conform to technical norms of compaction, drainage, and geometrics, so the roads that were built are hardly all-weather roads (Lall and Rastogi 2007). Accordingly, India’s Pradhan Mantri Grameen Sadak Yojana (Prime Minister’s Village Road Plan), launched in December 2000, has been concentrating on providing all-weather connectivity to all villages, with tighter technical specifications and modern building construction techniques.

Again, there is a clear difference between the two countries in financing and participation. Villagers in India do not pay any direct or indirect taxes, whereas in the PRC, villagers have been paying local transport levies and contributing free labor and local material for construction of roads.

Figure 13: Construction of Rural Roads in India, 1950–2005

Sources: India Roads Congress 2001; Ministry of Road, Transport, and Highways 2007.

33 In the PRC, the target for 2005–2010 is that all "suitable" townships and villages will have highways with regular bus service. Highways from counties to townships should be paved with cement or asphalt, and highways from townships to villages should be paved.
In summary, despite the PRC’s pro-urban bias and India’s ostensibly village-oriented infrastructure development, the PRC’s record on inclusiveness has been better than India’s. It is also more sustainable as it is based on user charges that mostly meet operating costs, whereas India’s provision of infrastructure services in rural areas is heavily—if not totally—subsidized.

### Environmental Impact and Policies

#### Power Sector: The Biggest Polluter

The dominance of coal-based power generation has caused greater environmental damage than any other industry in the PRC (Table 17 and Figure 14). As a result, the PRC is now the largest source of sulfur dioxide emissions in the world, and its power sector is responsible for a large share of sulfur dioxide, nitrogen oxide, and carbon dioxide emissions.\(^ {34} \) In fact, the PRC has overtaken the United States as the largest emitter of carbon dioxide from fossil fuels. While per capita greenhouse gas emissions are still low, the power sector is the PRC’s largest source of these emissions (OECD 2006). From 1990 to 2005, carbon dioxide emissions from thermal power plants as a share of total carbon dioxide emissions in the country increased from 29% to 40% (Figure 14).\(^ {35} \) Besides airborne pollutants, thermal power generation, which requires large amounts of process water, is also contributing to severe water shortages and deterioration in many parts of the country. Additionally, the PRC discharges huge amounts of solid waste each year from thermal plants.

\(^ {34} \) It is estimated that the power sector is responsible for 44% of sulfur dioxide emissions, 80% of nitrogen oxide emissions, and 26% of carbon dioxide emissions. Moreover, coal plants discharge significant amounts of mercury, exposure to which can cause neurological and developmental effects in children (Berrah, Lamech, and Zhao 2001).

\(^ {35} \) Over the same period, carbon dioxide emissions from thermal power plants, as a share of total carbon dioxide emissions in India, increased from 42% to 52%.

---

**Table 16: Progress of the Road Network in India (‘000 km)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>National highways</td>
<td>22</td>
<td>24</td>
<td>24</td>
<td>32</td>
<td>34</td>
<td>58</td>
<td>67</td>
</tr>
<tr>
<td>State highways</td>
<td>45</td>
<td>62</td>
<td>70</td>
<td>95</td>
<td>127</td>
<td>132</td>
<td>132</td>
</tr>
<tr>
<td>Other roads (including district roads and village roads)</td>
<td>333</td>
<td>429</td>
<td>821</td>
<td>1,358</td>
<td>2,166</td>
<td>3,010</td>
<td>3,101</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>515</td>
<td>915</td>
<td>1,485</td>
<td>2,327</td>
<td>3,200</td>
<td>3,300</td>
</tr>
<tr>
<td>Surface roads</td>
<td>156</td>
<td>234</td>
<td>398</td>
<td>684</td>
<td>1,090</td>
<td>1,600</td>
<td>–</td>
</tr>
</tbody>
</table>

km = kilometer.

Sources: India Roads Congress 2001; Ministry of Road, Transport, and Highways 2007.
In 2003, the total cost of air and water pollution in the PRC was estimated to be between 2.7% and 5.8% of GDP (World Bank 2007). Air pollution poses a large health risk in urban areas, whereas the burden of polluted water falls disproportionately on rural citizens, up to two-thirds or 500 million of whom do not have access to piped water (World Bank 2007). Northern PRC, which has 80% of the coal and some of the most polluted water basins, bears a double burden from air and water pollution. In fact, environmental pollution falls disproportionately more on the less economically advanced parts of the PRC, which have a higher share of the poor population.

The PRC’s growth strategy has taken a significant toll on the environment. Decentralization of power generation and deregulation of coal mining in the 1980s, while increasing investment and production, contributed in large part to environment degradation. Thousands of small village-collective and individually run coal mines, which used inefficient and severely polluting technology, sprung up.36 The government then attempted to close down smaller, mainly private mines that did not comply with environmental standards and to consolidate the coal industry. However, it is not clear to what extent mines were actually closed. Official statistics show a sharp decline from 1996 to 2000 in coal-based energy output and then a sharp rise, which may simply reflect false reporting by local governments (Naughton 2007). As part of the consolidation drive, the central government formed Shenhua Group in 1995, which has since become the largest coal producer in the world. The government also imposed taxes on land use and the environment, and introduced a bidding system to secure coal that, in effect, screens out the smaller operators. As a result, the share of large mines is gradually increasing, although even now there are as many as 25,000 enterprises, with the top 10 producers accounting for less than 30% of the market. Large-scale mining will enable investment in more efficient pollution-control technologies.

Similarly, there has been a major move to upgrade the power sector and to reduce the share of small-scale, inefficient coal-burning plants. Relatively large plants—of 300 megawatts or more—have increased their share in total capacity from 17% in 1990 to about 40% today. Since 2002, all new, expanded, or retrofitted coal plants

Table 17: Installed Power Capacity and Output Generated by Fuel Source, People’s Republic of China

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed capacity (GW)</td>
<td>135.0</td>
<td>217.0</td>
<td>357.0</td>
<td>508.0</td>
</tr>
<tr>
<td>Total output (GWh)</td>
<td>568.0</td>
<td>944.0</td>
<td>1,675.0</td>
<td>2,407.0</td>
</tr>
<tr>
<td>Hydropower (%)</td>
<td>22.3</td>
<td>20.2</td>
<td>17.2</td>
<td>16.5</td>
</tr>
<tr>
<td>Thermal power (%)</td>
<td>77.7</td>
<td>78.5</td>
<td>81.1</td>
<td>81.3</td>
</tr>
<tr>
<td>of which Coal (%)</td>
<td>NA</td>
<td>NA</td>
<td>77.2</td>
<td>78.7</td>
</tr>
<tr>
<td>Nuclear power (%)</td>
<td>0</td>
<td>1.4</td>
<td>1.6</td>
<td>2.2</td>
</tr>
</tbody>
</table>

GW = gigawatt, GWh = gigawatt-hour.


36 In 1995, there were 34,200 village collective-run mines and 34,700 individually run mines, which accounted for 46% of total coal output, more than the big nationally run mines (Naughton 2007).
Table 18: Installed Power Capacity and Output Generated by Fuel Source, India

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed capacity (GW)</td>
<td>66.0</td>
<td>83.0</td>
<td>108.0</td>
<td>118.0</td>
</tr>
<tr>
<td>Total output (GWh)</td>
<td>264.0</td>
<td>380.0</td>
<td>533.0</td>
<td>618.0</td>
</tr>
<tr>
<td>Hydropower (%)</td>
<td>27.1</td>
<td>19.1</td>
<td>12.0</td>
<td>16.2</td>
</tr>
<tr>
<td>Thermal (%)</td>
<td>70.5</td>
<td>78.8</td>
<td>84.1</td>
<td>80.1</td>
</tr>
<tr>
<td>of which Coal (%)</td>
<td>67.4</td>
<td>72.1</td>
<td>73.1</td>
<td>69.2</td>
</tr>
<tr>
<td>Oil (%)</td>
<td>0.0</td>
<td>0.2</td>
<td>1.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Gas (%)</td>
<td>3.1</td>
<td>6.6</td>
<td>9.9</td>
<td>10.0</td>
</tr>
<tr>
<td>Nuclear power (%)</td>
<td>2.3</td>
<td>2.1</td>
<td>3.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Wind power (%)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

GW = gigawatt, GWh = gigawatt-hour.

Figure 14: Carbon Dioxide Emissions from Thermal Power Plants and Power Generation

GW = gigawatt.
are required to install desulfurization equipment. The government, in its White Paper on Energy (State Council 2007), stated that such plants are now 30% of all thermal plants, up from 2% in 2000.

The government is taking several other measures to curb environmental pollution, including stricter environmental standards, switching to alternative technologies and energy-saving devices, demand-side management, and diversifying the sources of energy especially renewable energy. Legislation introduced in 2003 also increased penalties for the emission of air and water pollutants. Yet, pollution fees do not cover the cost of pollution control. Observers claim that the problem is not the PRC’s environmental laws—many of which are adopted from the best European legislation—but in their lax enforcement. When incentives are weighed heavily toward economic growth, environmental issues would surely be relegated to a lower priority by local governments. The effectiveness of the State Environmental Protection Agency and poorly funded local environmental protection bureaus has been hindered by intervention from other agencies. In a move to strengthen the environmental agency, the government has recently created the new Ministry of Environmental Protection (March 2008) by upgrading the status of the State Environmental Protection Agency.

The PRC has made limited use of demand-side management. The main area of focus has been load management, which has used time-of-use pricing, interruptible tariffs, and deployment of energy storage (cooling and heating). By these means, the PRC was able to reduce peak loads and shift use from peak to off-peak periods. While government action reduced peak load by over 10 gigawatts in selected provinces in 2003, only 30% was due to demand-side management, and the rest was due to energy rationing imposed by government orders, or requests or advice to modify schedules (World Bank 2005b).

While all of the above measures will have some effect, the greatest impact could be if the PRC diversified away from coal to using other fuel sources. The PRC’s heavy reliance on coal stands out in international comparisons. Except for the PRC, the rest of the world depends much less on coal (only 21%) (Naughton 2007). About 40% of world energy consumption is based on the relatively clean technologies from natural gas, nuclear, and hydropower. The United States, which consumes a quarter of the world’s energy, draws from diversified fuel sources. France relies on nuclear power for almost 40% of its energy, while the Russian Federation draws on its huge natural gas reserves for over 50% of its energy. Only India comes anywhere close to the PRC’s reliance on coal.

Indeed, the PRC’s recent long-term policy shift to diversify fuel sources has assumed growing importance in controlling environmental pollution. Larger hydropower, long-distance lines for transmission and nuclear and gas-fired power plants have been planned, as the PRC gears up to become a large-scale energy importer. The government is also making a big push to increase the use of renewable energy (Box 6). Notwithstanding the PRC’s determination to diversify, it is likely that coal will continue to dominate, given its vast coal reserves.

---

37 For instance, the pollution fee for sulfur dioxide emissions was raised to CNY600 ($72.50) per ton in 2005 from CNY200 ($25.00), but the cost of sulfur dioxide control is about CNY1,000 ($120.80) per ton (World Bank 2005a).
The 11th Five-Year Plan (2006–2010) aims to reduce energy intensity by 20%. Yet after 2 decades of declining energy intensity, there has been a reversal in the trend as the growth of heavy industry rises. With per capita consumption of electricity still at around developing country levels, it will surely rise in coming years, straining the government’s capacity to control emissions. It is projected that electricity output may quadruple over the next 20 years. This would imply that even with significant productivity improvement, coal output would at least double over this period.

The PRC has become the second largest coal consumer in the world, and it is predicted that coal may continue to account for 60%–70% of generation capacity in 2020 (China Energy Development Strategy and Policy Research Group 2004). For this reason, the power sector is—and may continue to be—the largest emitter of some of the most significant pollutants in the PRC.

Box 6: Renewable Energy in the People’s Republic of China

The People’s Republic of China (PRC) is keen to develop its renewable sources of energy (i.e., wind, solar, and biomass). In 2005, the Renewable Energy Promotion Law was enacted, giving priority to renewable electricity for grid connection, preferential prices, and public sharing of costs. Estimates of actual installed capacity and consumption of renewable energy vary, and it is difficult to verify since much of it is off-grid. It is estimated to be about 7%. The Medium- and Long-term Development Program of National Development and Reform Commission aims to increase renewable energy to 10% of total energy consumption by 2010 and 15% by 2020. It is likely that the PRC will meet and even exceed its renewable energy development targets for 2020. Total power capacity from renewable energy could reach 400 gigawatts (GW) by 2020, nearly triple the 135 GW existing in 2006, with hydro, wind, biomass, and solar photovoltaic power making the greatest contributions.

In the last few years, the PRC is trying to use as much solar power as possible, especially for heating purposes. As it is off-grid (200–300 megawatts by 2005), this energy is not reflected in the statistics. The central government gave grants and preferential loans to enterprises for solar energy pilot projects (using photovoltaic cells) in remote areas. It also allows wind farm equipment to be imported without customs tariffs and value-added taxes on wind power generation. On grid tariffs from wind power, generators are allowed double the normal tariff. The government is also encouraging biomass energy, including development of ethanol, biodiesel, methane, and biomass power generation.

The PRC is committed to becoming a world leader in renewable energy manufacturing. Already, it is a global manufacturing powerhouse for solar photovoltaic power, third only to Japan and Germany, with huge investments in recent years. The PRC is the world’s largest market for solar hot water, with nearly two thirds of global capacity. The country’s 40 million solar hot water systems mean that more than 10% of the PRC households rely on the sun to heat their water. In addition, the PRC is now also one of only a few countries capable of mass production of wind turbines.

The 11th Five-Year Plan (2006–2010) aims to reduce energy intensity by 20%. Yet after 2 decades of declining energy intensity, there has been a reversal in the trend as the growth of heavy industry rises. With per capita consumption of electricity still at around developing country levels, it will surely rise in coming years, straining the government’s capacity to control emissions. It is projected that electricity output may quadruple over the next 20 years. This would imply that even with significant productivity improvement, coal output would at least double over this period.

The PRC has become the second largest coal consumer in the world, and it is predicted that coal may continue to account for 60%–70% of generation capacity in 2020 (China Energy Development Strategy and Policy Research Group 2004). For this reason, the power sector is—and may continue to be—the largest emitter of some of the most significant pollutants in the PRC.

NDRC and many state research institutes are putting enormous effort into researching energy efficiency and renewable energy sources. Research on coal liquefaction is a key project.
Lessons for India

The power sector in India is also heavily dependent on coal (Table 18). Yet due to lack of coal sector reforms, it has not exploited its coal in as large a scale as the PRC. Going forward, therefore, there is an opportunity to learn from the PRC’s experience. Large-scale coal mining with improved technology is necessary in such a hazardous industry. Thus, India must open up the sector to experienced private operators; ensure transparent, competitive bidding for coal blocks; and introduce appropriate pricing. The announcement of a coal regulator is a positive step in this regard. Center-state tensions over revenue sharing from resource extraction also need to be resolved. To reduce air and water pollution emanating from coal mining and coal-based thermal power plants, India must implement strict environmental standards while ramping up its power-generation capacity.

It must also rely on improved pricing for demand-side management, an aspect that the PRC has not emphasized. The PRC has mainly relied on load management rather than end-use energy efficiency. International experience has shown that demand-side management can improve energy efficiency significantly, resulting in dramatic savings and fewer power shortages.

Finally, India also needs to follow through in continuing to provide adequate incentives to develop renewable sources of energy as well as for research and development (Box 7).

Conclusions and Key Lessons

Infrastructure Financing

Effective user charges to end users of infrastructure services in India are much lower than in the PRC, implying that the subsidy buried in the infrastructure financing chain is considerably greater in India than in the PRC. The degree of subsidization from the banking system seems limited in both countries—the debt is being serviced by borrowers, and asset quality in the banks does not appear to be deteriorating due to lending to infrastructure.

Budgetary allocations to infrastructure are much smaller (relative to funding needs) in the PRC than India. In fact, the government budgetary contribution to the sector is limited to capital subsidies for fixed investment. Costs of both capital expenditure and operating expenses are recovered by local governments and their agencies through extrabudgetary levies and sales of land-use rights.

The importance of extrabudgetary revenues for local governments is huge, so the effective tax burden is much higher than budgetary numbers would suggest. Many of these extrabudgetary resources are dedicated funds at different levels of government and comprise, in good part, proceeds from the sale and/or development of local government-owned land. This stream of revenue provides the bulk of the equity invested in the sector. The implicit subsidy to the consumer is, therefore, paid through a submarket return on the equity contribution of a range of SOEs and agencies engaged in the infrastructure value chain.

In comparison, in India, the tax-funded government budget bears the burden of subsidizing the end-use of infrastructure services. Little effort is made to monetize
Box 7: Renewable Energy in India

Renewable energy is an important element in India’s power policy, aimed to meet the needs of remote areas in an environmentally sustainable manner. India is the first country to have a separate ministry called Ministry of New and Renewable Energy for developing and promoting nonconventional energy sources in the country. The major sources of renewable energy are wind, solar, biomass, and small hydroelectric power plants (with sizes less than 25 megawatts (MW)). Whereas many small plants are stand-alone plants in remote areas, a few plants are captive, and some are grid-connected systems. In the past few years, total grid-connected installed capacity has grown to 10,813 MW (7.8% of total installed capacity) in 2007 compared with 1,628 MW (1.6% of total installed capacity) in 2001.

Besides growing power deficits and the worldwide focus on greenhouse gas emissions, the opportunities offered by carbon trading have pushed private entrepreneurs to invest in renewable energy plants in India. Wind energy has been the most popular. A package of financial and fiscal incentives, which mainly includes 80% accelerated depreciation, concessional customs duty on specified items, and tax exemption for 10 years, boosted wind energy in the country. In addition, grid-connected wind power enjoys preferential tariffs in almost all states, and the Electricity Act, 2003 provides for state electricity regulatory commissions to fix a minimum percentage of energy purchases from renewable sources. Generation and distribution of renewable energy is encouraged in notified rural areas without any need for obtaining a license from these commissions. Moreover, as a further incentive, the Indian Renewable Energy Development Agency provides concessional funds to renewable energy projects.

While wind energy has been the most exploited, solar photovoltaic power, which is mainly used in lighting, water pumping, and battery charging in remote rural areas, has hardly been exploited. Technological advances have brought down its costs globally. Given the huge potential it offers in India and the need to electrify vast remote off-grid areas, some government subsidy could play a crucial role in launching it. Probably the first solar energy-based grid connected system will come on stream in 2009. Biomass energy is used both in stand-alone and grid-connected modes for combined heat and power generation. The government has been promoting small hydro off-grid power generation in remote areas of the country.

<table>
<thead>
<tr>
<th>Existing (MW)</th>
<th>Share of Total Power (%)</th>
<th>Potential (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed capacity of renewable energy</td>
<td>10,813</td>
<td>7.7</td>
</tr>
<tr>
<td>Of which: Wind</td>
<td>7,660</td>
<td>5.4</td>
</tr>
<tr>
<td>Biomass</td>
<td>1,178</td>
<td>0.8</td>
</tr>
<tr>
<td>Small hydroa</td>
<td>1,975</td>
<td>1.4</td>
</tr>
<tr>
<td>Solar PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total power capacity</td>
<td><strong>141,080</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

MW = megawatt, PV = photovoltaic.

a As of January 2008.

Source: India Infrastructure Research 2007.
government landholdings for raising resources for infrastructure development. Government spending generally given as grant does not have effective cost recovery and may not even earn positive returns. Budgetary expenditures are allocated to funding losses, and there are large subsidies to certain classes of users, so investment from state-owned agencies involved in infrastructure service delivery earns low to negative returns. Meanwhile, private sector equity providers earn superior returns.

In essence, in the PRC, the subsidy implicit in the infrastructure financing chain is intended more to incentivize the creation of new capacity than to protect the end user. In India, the subsidy goes toward pleasing end users of infrastructure services, covering up for the inefficiencies and operating losses of state-owned service providers, and safeguarding the superior returns to the equity of private investors. This results in a huge strain on fiscal health, creates commercially unsustainable delivery systems, and leads to systematic underinvestment in infrastructure.

The lessons for India from the PRC infrastructure finance experience are to (i) find a better balance between user costs and subsidies; (ii) explore more creative and commercially sustainable ways of using SOEs to deliver services at possibly modest financial rates of return but high economic rates of return; and (iii) explore more sources of investible public funds, notably from the sale and/or development of land owned by municipalities and government agencies.

Institutional Framework

The PRC institutional framework is highly effective in delivering projects speedily and within cost. While much of the planning is centralized, the construction—as well as operations and maintenance—take place at the provincial level or below. Thus, a high degree of coordination is required. Plans are very important to ensure that coordination. For instance, substantial parts of plans are sufficiently detailed to cater to the development of ancillary infrastructure requirements, such as hinterland development of ports. Underlying the plans are, in effect, blueprints for regions. Interministerial coordination is more effective than in India, arguably on account of the unique role played by NDRC. Although the PRC has managed without recourse to independent regulators, as state-owned infrastructure providers become more commercial in nature, the need for regulation will become unavoidable.

Given the much more active role of profit-seeking private players in the infrastructure space, India cannot do without strong and truly independent regulators, some of whom are beginning to make their presence felt. India, on the other hand, has a huge challenge in improving its governance and decision-making framework, which is hobbled by interjurisdictional and intergovernmental wrangling, and complicated by the country’s federal structure and dependence on coalition politics.

Access to Infrastructure

Despite the PRC’s pro-urban bias and India’s ostensibly village-oriented infrastructure development, the PRC’s record on inclusiveness has been better than India’s. Notably, while the PRC has been successful in providing almost universal household access to electricity, India has not. Similarly, regarding roads, while the PRC lagged in its development of the rural road network, it has made important strides in providing reliable connectivity to rural households. India has embarked on important recent initiatives to deliver greater access to infrastructure services, but it is too early to assess the results.
However, one lesson is clear. The PRC’s initiatives at developing inclusive infrastructure are likely to be more sustainable, as they are based on user charges that meet operating costs. In India, though, provision of infrastructure services in rural areas is heavily—if not totally—subsidized.

**The Environment**

The rapid growth of the PRC’s infrastructure—and, in particular, its heavy reliance on coal for meeting energy demand—has resulted in serious adverse environmental and social consequences. India, too, relies significantly on coal for power generation, but as yet has not exploited coal at as large a scale. This is an opportune time to draw lessons from the PRC’s experience to exploit coal in a better manner using superior technology. One way is to develop large-scale mines with ancillary infrastructure to wash, treat, and transport coal using improved technologies. Power plants also need to equip themselves with the requisite pollution-control technology, for which appropriate incentives may be provided by the government. Unlike the PRC, India also may still have an opportunity to focus on demand-side management to forge a less energy-intensive growth path in the coming years, which has implications for fuel pricing. Finally, India must pursue a focused policy of encouraging the development of renewable energy.
References


Credit Lyonnais. 2007. *Analysts Reports*. Hong Kong: Credit Lyonnais SA.


International Monetary Fund (IMF). 2002. Public Information Notice No. 02/97: Article IV Consultation with the PRC. Washington, DC.
———. 2003. Public Information Notice No. 03/136: Article IV Consultation with the PRC. Washington, DC.
———. 2005. Public Information Notice No. 05/122: Article IV Consultation with the PRC. Washington, DC.
———. 2006b. IMF China Staff Report 2006 Article IV Consultation. Washington, DC.
———. 2007. IMF India Staff Report 2007 Article IV Consultation. Washington, DC.
———. 2008. Interview with author. 7 February.


Road King Infrastructure Ltd. 2007. Annual Report 2006. Hong Kong: Road King Infrastructure Ltd.


## Appendix Tables

### Table A.1: Macroeconomic Indicators, India

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP Growth (%)</td>
<td>4.40</td>
<td>5.80</td>
<td>3.80</td>
<td>8.50</td>
<td>7.50</td>
<td>9.40</td>
<td>9.60</td>
</tr>
<tr>
<td>( % of GDP )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross domestic savings</td>
<td>23.70</td>
<td>23.50</td>
<td>26.40</td>
<td>29.80</td>
<td>31.80</td>
<td>34.30</td>
<td>34.80</td>
</tr>
<tr>
<td>Household sector</td>
<td>21.60</td>
<td>22.15</td>
<td>23.19</td>
<td>24.35</td>
<td>23.05</td>
<td>24.22</td>
<td>23.80</td>
</tr>
<tr>
<td>Private sector</td>
<td>3.85</td>
<td>3.38</td>
<td>3.86</td>
<td>4.38</td>
<td>6.56</td>
<td>7.50</td>
<td>7.78</td>
</tr>
<tr>
<td>Public sector</td>
<td>(1.75)</td>
<td>(2.03)</td>
<td>(0.65)</td>
<td>1.07</td>
<td>2.19</td>
<td>2.58</td>
<td>3.22</td>
</tr>
<tr>
<td>GDCF</td>
<td>24.30</td>
<td>22.90</td>
<td>25.20</td>
<td>28.20</td>
<td>32.20</td>
<td>35.50</td>
<td>35.90</td>
</tr>
<tr>
<td>Government revenue</td>
<td>19.70</td>
<td>19.10</td>
<td>20.00</td>
<td>18.70</td>
<td>19.60</td>
<td>20.20</td>
<td>21.10</td>
</tr>
<tr>
<td>Government expenditure</td>
<td>30.90</td>
<td>31.10</td>
<td>31.10</td>
<td>27.80</td>
<td>26.90</td>
<td>26.90</td>
<td>27.20</td>
</tr>
<tr>
<td>Overall budget balance</td>
<td>10.40</td>
<td>10.80</td>
<td>10.40</td>
<td>9.10</td>
<td>7.30</td>
<td>6.80</td>
<td>6.20</td>
</tr>
<tr>
<td>Primary balance</td>
<td>3.90</td>
<td>4.00</td>
<td>3.40</td>
<td>2.70</td>
<td>1.20</td>
<td>1.00</td>
<td>0.40</td>
</tr>
<tr>
<td>FDI, net ($ billion)</td>
<td>5.90</td>
<td>6.70</td>
<td>4.20</td>
<td>13.70</td>
<td>13.00</td>
<td>15.50</td>
<td>15.50</td>
</tr>
<tr>
<td>Investment in infrastructure</td>
<td>4.50</td>
<td>4.10</td>
<td>3.30</td>
<td>3.50</td>
<td>3.50</td>
<td>4.70</td>
<td>5.60</td>
</tr>
</tbody>
</table>

**Memo Items**

| Nominal GDP (in Rs billion) | 19,254 | 21,002 | 22,653 | 25,382 | 28,777 | 32,756 | 37,900 |

FDI = foreign direct investment, GDCF = gross domestic capital formation, GDP = gross domestic product, Q = quick estimates.

Note: Numbers in parenthesis denote a negative value.

* Lall and Rastogi 2007; Planning Commission, Government of India.

Table A.2: Listed Power Companies in the People’s Republic of China, End 2003*  
(CNY million)

<table>
<thead>
<tr>
<th>Power Companies</th>
<th>Assets</th>
<th>Revenues</th>
<th>Profit</th>
<th>Profitability (%)</th>
<th>Return on Assets (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huaneng Power International, Inc. (A-share and HK)</td>
<td>53,277</td>
<td>23,480</td>
<td>5,457</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Datang International Power Generation Co., Ltd. (HK)</td>
<td>35,544</td>
<td>9,951</td>
<td>1,812</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>China Yangtze Power Co., Ltd.</td>
<td>29,617</td>
<td>2,986</td>
<td>1,438</td>
<td>48</td>
<td>5</td>
</tr>
<tr>
<td>SP Power Development Co.</td>
<td>22,749</td>
<td>4,846</td>
<td>675</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Huadian Power International Corporation Limited (HK)</td>
<td>20,580</td>
<td>8,066</td>
<td>1,029</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>China Resources Power Holdings</td>
<td>15,894</td>
<td>5,206</td>
<td>589</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Shenergy Co. Ltd.</td>
<td>13,493</td>
<td>3,042</td>
<td>1,034</td>
<td>34</td>
<td>8</td>
</tr>
<tr>
<td>Inner Mongolia Mengdian Huaneng Thermal Power Corp.</td>
<td>11,680</td>
<td>3,037</td>
<td>334</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Shanghai Electric Power Company Ltd.</td>
<td>10,825</td>
<td>5,448</td>
<td>402</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Guangzhou Development Industry (Holdings) Co., Ltd.</td>
<td>10,143</td>
<td>3,518</td>
<td>805</td>
<td>23</td>
<td>8</td>
</tr>
<tr>
<td>Zhejiang Southeast Electric Power Co. (B-shares)</td>
<td>8,680</td>
<td>4,738</td>
<td>609</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Datang Hunan Huayin Electric Power Co. Ltd.</td>
<td>5,285</td>
<td>1,003</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Top Energy Co., Ltd. Shanxi</td>
<td>5,144</td>
<td>1,868</td>
<td>234</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>SDIC Huajing Power Holdings Co. Ltd.</td>
<td>4,601</td>
<td>1,377</td>
<td>215</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Heilongjiang Electric Power Co. Ltd.</td>
<td>3,605</td>
<td>1,125</td>
<td>249</td>
<td>22</td>
<td>7</td>
</tr>
<tr>
<td>Zhengzhou Coal Industry &amp; Electric Power Co., Ltd.</td>
<td>2,515</td>
<td>908</td>
<td>85</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Sichuan Mingxing Electric Power Co., Ltd.</td>
<td>2,294</td>
<td>409</td>
<td>103</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Chongqing Jiulong Electric Power Co. Ltd.</td>
<td>2,256</td>
<td>397</td>
<td>62</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Beijing Jingneng Thermal Power Co., Ltd.</td>
<td>2,094</td>
<td>1,110</td>
<td>86</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Sichuan Minjiang Hydropower Co., Ltd.</td>
<td>1,681</td>
<td>344</td>
<td>69</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Dalian Thermal Power Co., Ltd.</td>
<td>1,550</td>
<td>408</td>
<td>17</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

*continued on next page*
### Table A.2 continued

<table>
<thead>
<tr>
<th>Power Companies</th>
<th>Assets</th>
<th>Revenues</th>
<th>Profit</th>
<th>Profitability (%)</th>
<th>Return on Assets (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangxi Guidong Electric Power Co. Ltd.</td>
<td>1,304</td>
<td>330</td>
<td>62</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Chongqing Three Gorges Water Conservancy and Electric Power Co. Ltd.</td>
<td>1,180</td>
<td>333</td>
<td>8</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Sichuan Xichang Power Joint Stock Co. Ltd.</td>
<td>1,156</td>
<td>164</td>
<td>23</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>Leshan Electric Power Co., Ltd.</td>
<td>1,147</td>
<td>271</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Shenyang Jinshan Thermoelectric Co. Ltd.</td>
<td>717</td>
<td>109</td>
<td>49</td>
<td>45</td>
<td>7</td>
</tr>
<tr>
<td>Xinjiang Tianfu Thermoelectric Co. Ltd.</td>
<td>681</td>
<td>505</td>
<td>60</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

CNY = yuan.

* Domestic A-share listings except where noted.

Sources: Shanghai Stock Exchange; Hong Kong Stock Exchange; and companies.

### Table A.3: Road Mileage by Technical Condition (km)

<table>
<thead>
<tr>
<th>Technical Condition</th>
<th>2006</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard road mileage</td>
<td>2,282,872</td>
<td>2,139,887</td>
</tr>
<tr>
<td>Expressway</td>
<td>45,339</td>
<td>41,005</td>
</tr>
<tr>
<td>Class I</td>
<td>45,289</td>
<td>41,687</td>
</tr>
<tr>
<td>Class II</td>
<td>262,678</td>
<td>248,199</td>
</tr>
<tr>
<td>Class III</td>
<td>354,734</td>
<td>347,160</td>
</tr>
<tr>
<td>Class IV</td>
<td>1,574,833</td>
<td>1,461,835</td>
</tr>
<tr>
<td>Substandard road mileage</td>
<td>1,174,128</td>
<td>1,205,299</td>
</tr>
<tr>
<td>Percentage of standard road to the total</td>
<td>66%</td>
<td>64%</td>
</tr>
</tbody>
</table>

km = kilometer.

Sources: Li 2005; Ministry of Communications 2006.

### Table A.4: Road Mileage by Pavement Classification (km)

<table>
<thead>
<tr>
<th>Pavement</th>
<th>2006</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paved road</td>
<td>996,455</td>
<td>839,893</td>
</tr>
<tr>
<td>Simply paved road</td>
<td>528,633</td>
<td>523,548</td>
</tr>
<tr>
<td>Unpaved road</td>
<td>1,931,911</td>
<td>1,981,744</td>
</tr>
<tr>
<td>Percentage of paved road and simply paved road to total mileage</td>
<td>44.1%</td>
<td>40.8%</td>
</tr>
</tbody>
</table>

km = kilometer.

Sources: Li 2005; Ministry of Communications 2006.
Table A.5: Road Mileage by Administrative Level (km)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Mileage</th>
<th>National Road</th>
<th>Provincial Road</th>
<th>County Road</th>
<th>Township Road</th>
<th>Accommodation Road</th>
<th>Village Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1,278,474</td>
<td>114,786</td>
<td>189,916</td>
<td>383,747</td>
<td>536,813</td>
<td>53,167</td>
<td>–</td>
</tr>
<tr>
<td>1999</td>
<td>1,351,691</td>
<td>111,135</td>
<td>192,517</td>
<td>398,045</td>
<td>589,886</td>
<td>54,108</td>
<td>–</td>
</tr>
<tr>
<td>2000</td>
<td>1,679,848</td>
<td>118,983</td>
<td>212,450</td>
<td>461,872</td>
<td>800,681</td>
<td>85,166</td>
<td>–</td>
</tr>
<tr>
<td>2001</td>
<td>1,698,012</td>
<td>121,587</td>
<td>213,044</td>
<td>463,665</td>
<td>813,699</td>
<td>86,017</td>
<td>–</td>
</tr>
<tr>
<td>2002</td>
<td>1,765,222</td>
<td>125,003</td>
<td>216,249</td>
<td>471,239</td>
<td>865,635</td>
<td>87,096</td>
<td>–</td>
</tr>
<tr>
<td>2003</td>
<td>1,809,828</td>
<td>127,899</td>
<td>223,425</td>
<td>472,935</td>
<td>898,300</td>
<td>87,269</td>
<td>–</td>
</tr>
<tr>
<td>2004</td>
<td>1,870,661</td>
<td>129,815</td>
<td>227,871</td>
<td>479,372</td>
<td>945,180</td>
<td>88,424</td>
<td>–</td>
</tr>
<tr>
<td>2005</td>
<td>3,345,187</td>
<td>132,674</td>
<td>233,783</td>
<td>507,493</td>
<td>987,932</td>
<td>63,446</td>
<td>1,419,864</td>
</tr>
<tr>
<td>2006</td>
<td>3,456,999</td>
<td>133,355</td>
<td>239,580</td>
<td>506,483</td>
<td>987,608</td>
<td>57,986</td>
<td>1,531,987</td>
</tr>
</tbody>
</table>

– = no data, km = kilometer.

Sources: Li 2005; Ministry of Communications 2006.

Table A.6: Electricity Prices in Selected People’s Republic of China Provinces, 2004

<table>
<thead>
<tr>
<th>Province</th>
<th>Urban Residential</th>
<th>Rural Residential</th>
<th>Non-Residential Lighting</th>
<th>Commerce</th>
<th>General Industry</th>
<th>Large Industry</th>
<th>Agricultural Production</th>
<th>Agricultural Irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing</td>
<td>53.2</td>
<td>53.2</td>
<td>76.6</td>
<td>77.4</td>
<td>68.5</td>
<td>50.8</td>
<td>57.9</td>
<td>36.1</td>
</tr>
<tr>
<td>Tianjin</td>
<td>49.6</td>
<td>49.6</td>
<td>75.9</td>
<td>71.3</td>
<td>67.7</td>
<td>46.7</td>
<td>52.7</td>
<td>21.2</td>
</tr>
<tr>
<td>Liaoning</td>
<td>52.6</td>
<td>52.6</td>
<td>76.8</td>
<td>87.1</td>
<td>73.3</td>
<td>44.7</td>
<td>47.2</td>
<td>–</td>
</tr>
<tr>
<td>Shanghai</td>
<td>73.2</td>
<td>73.2</td>
<td>89.6</td>
<td>77.1</td>
<td>79.7</td>
<td>67.2</td>
<td>66.1</td>
<td>–</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>61.7</td>
<td>47.5</td>
<td>94.8</td>
<td>106.9</td>
<td>78.5</td>
<td>53.6</td>
<td>49.7</td>
<td>33.0</td>
</tr>
<tr>
<td>Fujian</td>
<td>51.0</td>
<td>51.0</td>
<td>60.8</td>
<td>93.5</td>
<td>71.6</td>
<td>57.7</td>
<td>23.6</td>
<td>–</td>
</tr>
<tr>
<td>Hubei</td>
<td>61.4</td>
<td>61.4</td>
<td>80.7</td>
<td>110.3</td>
<td>68.2</td>
<td>44.6</td>
<td>53.8</td>
<td>26.0</td>
</tr>
<tr>
<td>Sichuan</td>
<td>50.8</td>
<td>50.8</td>
<td>75.0</td>
<td>86.8</td>
<td>63.5</td>
<td>47.5</td>
<td>52.0</td>
<td>13.9</td>
</tr>
<tr>
<td>Guangdong</td>
<td>75.0</td>
<td>75.0</td>
<td>–</td>
<td>108.0</td>
<td>83.9</td>
<td>72.8</td>
<td>72.6</td>
<td>–</td>
</tr>
<tr>
<td>Shanxi</td>
<td>59.3</td>
<td>59.3</td>
<td>77.6</td>
<td>92.1</td>
<td>62.4</td>
<td>47.2</td>
<td>50.7</td>
<td>–</td>
</tr>
<tr>
<td>Qinghai</td>
<td>43.8</td>
<td>43.8</td>
<td>53.3</td>
<td>79.6</td>
<td>40.0</td>
<td>30.5</td>
<td>33.1</td>
<td>24.3</td>
</tr>
<tr>
<td>Ningxia</td>
<td>54.1</td>
<td>54.1</td>
<td>71.6</td>
<td>90.0</td>
<td>60.7</td>
<td>36.5</td>
<td>43.8</td>
<td>26.0</td>
</tr>
<tr>
<td>Average</td>
<td>57.1</td>
<td>56.0</td>
<td>75.7</td>
<td>90.0</td>
<td>68.2</td>
<td>50.0</td>
<td>50.3</td>
<td>25.8</td>
</tr>
</tbody>
</table>

– = no data, MWh = megawatt-hour.

### Table A.7: Electricity Prices in Selected States of India, 2004 ($ per MWh)

<table>
<thead>
<tr>
<th>State</th>
<th>Domestic</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Agriculture and/or Irrigation</th>
<th>Railway Traction</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maharashtra</td>
<td>61.7</td>
<td>107.9</td>
<td>81.5</td>
<td>30.8</td>
<td>92.5</td>
<td>85.9</td>
</tr>
<tr>
<td>Gujarat</td>
<td>68.3</td>
<td>105.7</td>
<td>92.5</td>
<td>22.0</td>
<td>112.3</td>
<td>63.9</td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>35.2</td>
<td>107.9</td>
<td>88.1</td>
<td>8.8</td>
<td>90.3</td>
<td>41.9</td>
</tr>
<tr>
<td>Punjab</td>
<td>58.6</td>
<td>99.1</td>
<td>80.0</td>
<td>11.7</td>
<td>0.0</td>
<td>46.3</td>
</tr>
<tr>
<td>Haryana</td>
<td>73.8</td>
<td>97.6</td>
<td>92.5</td>
<td>13.4</td>
<td>83.3</td>
<td>93.2</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>50.2</td>
<td>109.9</td>
<td>86.1</td>
<td>26.4</td>
<td>88.1</td>
<td>84.1</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>45.8</td>
<td>121.2</td>
<td>93.4</td>
<td>4.8</td>
<td>0.0</td>
<td>75.1</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>50.7</td>
<td>130.0</td>
<td>90.3</td>
<td>8.8</td>
<td>99.1</td>
<td>30.8</td>
</tr>
<tr>
<td>Karnataka</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BESCOM</td>
<td>79.5</td>
<td>0.0</td>
<td>72.9</td>
<td>15.2</td>
<td>–</td>
<td>105.3</td>
</tr>
<tr>
<td>GESCOM</td>
<td>84.1</td>
<td>133.3</td>
<td>103.5</td>
<td>16.5</td>
<td>–</td>
<td>95.2</td>
</tr>
<tr>
<td>HESCOM</td>
<td>70.5</td>
<td>133.7</td>
<td>103.1</td>
<td>10.6</td>
<td>–</td>
<td>85.0</td>
</tr>
<tr>
<td>MESCOM</td>
<td>68.9</td>
<td>134.8</td>
<td>97.6</td>
<td>12.1</td>
<td>–</td>
<td>85.5</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>62.3</strong></td>
<td><strong>116.5</strong></td>
<td><strong>90.1</strong></td>
<td><strong>15.1</strong></td>
<td><strong>80.8</strong></td>
<td><strong>74.3</strong></td>
</tr>
</tbody>
</table>


Source: Infrastructure Development Finance Company.
The spectacular economic growth witnessed in the People’s Republic of China (PRC) over the past 3 decades has generated tremendous interest in the academic and policy arenas. The PRC’s real gross domestic product (GDP) grew at an average annual rate of 10.0% and 9.7% over 1978–1993 and 1993–2006, respectively. A combination of explosive economic growth and declining population growth rates has resulted in an annual average increase in per capita income of 8.5% between 1980 and 2006 significantly reducing poverty levels in the process (World Bank 2007).

The PRC experience is remarkable—not merely for the magnitude by which output has increased—but also for the prolonged period for which growth has been sustained and the sheer number of people who have been positively impacted. The only comparable episodes are that of Japan (which had an average annual growth rate of 8% from 1956 to 1974) and East Asia—Taipei, China and the Republic of Korea—(where growth averaged 7% from 1980 to 1996).

Manufacturing—in particular labor-intensive mass manufacturing—has been the engine of growth in the PRC since sweeping economic reforms were initiated in 1978. The PRC development policy, from the days following the Communist takeover in 1949, drew its inspiration from Soviet planning models of the 1930s that propagated rapid industrialization as the best way to break the shackles of low productivity equilibrium. Following reforms in 1978, the PRC industrial policy was distinguishable for its emphasis on light industry, production of consumer durables, and dependence on external demand. It was also more consistent with the PRC’s prevailing technical capabilities and comparative advantage in factor endowments, such as the availability of surplus labor.

PRC development plans have historically been far more ambitious for a country of its general development level (Figure 1). In the 1950s, when it was still very poor, investment was routinely over 20% of GDP, reaching a peak of 43% in

---

1 Rajeev Anantaram is a senior fellow at the Indian Council for Research on International Economic Relations, New Delhi. Mohammed Saqib is a fellow at the Rajiv Gandhi Foundation, New Delhi. The authors thank Rajiv Kumar, Shravan Nigam, and Xiang Tang for their helpful comments, and Indrajit Sinha Roy and Pradip Saikia for their excellent research assistance.
1958. The high levels of investment resulted in industrial output growing by an annual average of 11.5% between 1952 and 1978 (Awokuse and Weishi 2007; Naughton 2007).

Figure 1: Investment as Share of Gross Domestic Product, 1952–2004

While investment has fluctuated over the 5 decades between 1952 and 2004, it has never dropped below 20% of GDP except for a brief period in the early 1960s, largely in response to policy excesses that took place in the years immediately preceding it. It is remarkable how the single-minded focus on industrial development never wavered even during periods of political upheaval, such as the Great Leap Forward (1958–1961) and the Cultural Revolution (1966–1976).

The 2 decades between 1960 and 1978 were characterized by inconsistency in economic policy formulation, though the broad contours of the development paradigm established in the 1950s remained unchanged. Thus, while industrial growth never reached the peak average growth rate of 17% witnessed between 1952 and 1957, it never faltered entirely, either. Investment in physical and human capital that was to become the bedrock for the PRC manufacturing surge, beginning in the mid-1980s, continued largely without disruption.²

While investment has fluctuated over the 5 decades between 1952 and 2004, it has never dropped below 20% of GDP except for a brief period in the early 1960s, largely in response to policy excesses that took place in the years immediately preceding it. It is remarkable how the single-minded focus on industrial development never wavered even during periods of political upheaval, such as the Great Leap Forward (1958–1961) and the Cultural Revolution (1966–1976).

The 2 decades between 1960 and 1978 were characterized by inconsistency in economic policy formulation, though the broad contours of the development paradigm established in the 1950s remained unchanged. Thus, while industrial growth never reached the peak average growth rate of 17% witnessed between 1952 and 1957, it never faltered entirely, either. Investment in physical and human capital that was to become the bedrock for the PRC manufacturing surge, beginning in the mid-1980s, continued largely without disruption.²

In the early 1970s, the PRC embarked on a second round of industrialization, hoping to pick up the pieces from nearly a decade of economic stagnation. Also called the Big Push, the strategy focused on the rapid development of five industries—iron and steel, cement, chemical fertilizers, oil and natural gas, and farm implements—and sought to replicate the rapid industrial growth seen in the early 1950s. Though

² For a detailed explanation, see Naughton (2007), chapter 3.
well-intentioned, the program failed yet again to address the pressing economic problem confronting the PRC—the reallocation of surplus labor from agriculture—as the industries chosen for special attention were highly capital-intensive with significant economies of scale.

The death of Chairman Mao Zedong in 1976 and the political shakeup that followed soon thereafter enabled the PRC policy planners to objectively review the country’s development strategy in the 3 decades. The results were clearly mixed. On the positive side, despite widespread technological obsolescence, the foundations for further industrial development had been laid. Sporadic successes in high-technology areas such as nuclear weapons and satellite technology, notwithstanding massive Soviet assistance in the initial stages, had a strong demonstration effect. Investments in human and physical capital continued unabated and provided a solid foundation for future industrial growth.

However, the development strategy was seriously flawed in several ways:

- The focus on the capital goods sector, with scant regard for downstream use, squeezed the consumer goods sector, resulting in widespread scarcity.
- The share of agriculture in GDP continued to decline without a concomitant decline in the proportion of the labor force engaged in agriculture, resulting in widespread rural poverty. The additional employment created was largely in unproductive sectors—the labor force grew from 207 million in 1978 to 352 million in 1978, but only 37% of this growth was in the modern industrial or services sector.
- The structure of the economy was unbalanced. The PRC made the Chenery–Syrquin transition in the late 1960s, whereby sector predominance was transferred from agriculture to industry, but the share of services in GDP actually declined from 29% in 1952 to 24% in 1978, mainly due to the falling share of commerce.
- The capital-intensive development strategy adopted by the PRC prior to the reforms was technologically demanding and often beyond the country’s capacity to absorb. It resulted in low returns on investment, and even completed projects were run inefficiently. Resources were poured into wasteful projects with uncertain returns, instead of being directed toward the production of labor-intensive consumer goods that would have simultaneously alleviated the scarcity of such goods while providing mass employment.

The strategy of focusing on labor-intensive mass manufacturing, post-1978, has paid rich dividends. The PRC has emerged as a global manufacturing powerhouse, deeply integrated into global supply-chain networks, and in the process, has lifted close to 200 million people out of extreme poverty over the past 3 decades (World Bank 2007). However, the qualitative profile of its manufactured exports is not as impressive. Despite the high volume of the PRC’s high-technology exports, control of the vital technologies and skills still rests with Western multinational corporations with manufacturing operations in the PRC. The PRC performs labor-intensive, simple processing, and assembly operations for Western companies, with very little value added within the PRC. Conversely, the PRC is critically dependent on Western firms for both technology and marketing channels. This concerns the PRC policy makers and is something they are working hard to rectify (Tang 2008).
Table 1 provides a profile of manufacturing exports from the PRC for 2001 and 2005. It includes the top eight items by value, which collectively account for about 60% of exports in the years chosen. Electrical equipment and (light and heavy) machinery together accounted for approximately 32% of total exports in 2001, whereas apparel, toys, and footwear collectively accounted for a little less than 20%. For 2005, the corresponding figures are 46.00% and 13.64%, respectively. A look at the absolute numbers is equally instructive. Electrical and electronic equipment exports in nominal terms increased three and a half times, while machinery exports increased over five times.

Table 1: Profile of Manufacturing Exports, People’s Republic of China

<table>
<thead>
<tr>
<th>Products</th>
<th>Exports in Value ($ billion)</th>
<th>Exports as a Share of Total Exports (%)</th>
<th>Exports as a Share of World Exports (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical and electronic</td>
<td>51.3</td>
<td>172.3</td>
<td>19.3</td>
</tr>
<tr>
<td>equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy machinery</td>
<td>33.6</td>
<td>149.7</td>
<td>12.6</td>
</tr>
<tr>
<td>Light machinery</td>
<td>–</td>
<td>25.5</td>
<td>–</td>
</tr>
<tr>
<td>Apparel</td>
<td>32.4</td>
<td>65.9</td>
<td>12.2</td>
</tr>
<tr>
<td>Footwear</td>
<td>10.1</td>
<td>19.1</td>
<td>3.8</td>
</tr>
<tr>
<td>Toys</td>
<td>9.1</td>
<td>19.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Mineral fuels, oils, distillation products</td>
<td>8.4</td>
<td>–</td>
<td>3.2</td>
</tr>
<tr>
<td>Furniture</td>
<td>7.6</td>
<td>22.4</td>
<td>2.8</td>
</tr>
</tbody>
</table>

– = data not available.


Despite the changing profile of its export basket, the PRC mostly dominates export markets for low value-added products such as toys, apparel, and footwear. However, the PRC is making rapid inroads into the global equipment and machinery market as well. The PRC equipment manufacturers have more than doubled their global share of exports between 2001 and 2005, while the corresponding share of machinery exports has increased almost five times. While it is undeniable that the composition of the export basket has changed significantly, the PRC is still a few years away from competing as an exporter of goods at the higher end of the technology spectrum.

This paper studies the development of the manufacturing sector in the PRC from 1978 to the present.\(^3\) It identifies the mix of factors that led to the PRC’s preeminence as a manufacturing hub, with deeply embedded links to the global supply chain. They include a bottom-up development model starting with the liberalization of the agriculture sector, policies that encouraged the PRC firms to obtain scale rapidly,

---

\(^3\) The paper’s focus is explicitly on the manufacturing sector and not on industry as a whole. Thus, sectors such as construction and mining are not included, except in situations where disaggregated data for manufacturing is not available.
labor reforms that eliminated rigidities in the labor market, liberalization that allowed an increasing role for private entrepreneurship, foreign direct investment (FDI), and development of human capital. The success of these factors is largely due to the role of the Government of the PRC as a facilitator and the entrepreneurial response to emergent incentive structures.

**An Overview of the Manufacturing Sector in the People’s Republic of China**

Since the early 1980s, the manufacturing sector has not merely provided the impetus for overall economic growth in the PRC, but has significantly assisted in the reduction of extreme poverty by reallocating surplus agricultural labor. Employment in agriculture has proportionally declined from 71% of the work force in 1978 to 45% in 2005. However, as discussed in greater detail in section III, this reallocation process highlights redistribution issues in the PRC, particularly in the context of rural areas.

**Structural Composition of Gross Domestic Product**

Figure 2 shows the change in the structural composition of the PRC economy since 1978.

*Figure 2: Structural Composition of the People’s Republic of China’s Economy, 1978–2005*

GDP = gross domestic product.

---

4 The growth of the service sector has also contributed to absorbing some of the outflow of labor from the agriculture sector. The service sector employed 12% of the workforce in 1978, a figure that rose to 31% in 2005 (World Bank 2007). India had a comparable proportion of its labor force employed in the agriculture sector around 1980. However, the current proportion is around 55%.
Agriculture, which contributed 28% in value-added terms to GDP in 1978, saw its share decline to 13% in 2005. The share of services in value-added terms has correspondingly increased from 24% of GDP to 40%.

The share of industry in total output has consistently ranged from 42% to 48% of GDP during 1978–2006, without showing any distinctive trend. Industry's share in total GDP has remained constant since 1997. This does not imply the absence of industrial growth but instead reflects the rate at which the services sector is growing.

Especially by developing country standards, the share of industry in the overall GDP is very large. Industry includes mining, petroleum extraction, and utilities, which vary substantially across countries; therefore, it is more instructive for the purposes of international comparison to study the share of manufacturing in overall GDP. In the PRC, manufacturing makes up about 75% of the overall secondary sector (also including construction and industry), which makes value added in manufacturing about 35% of GDP. The high share of manufacturing is related to the PRC's high investment rate, which keeps the demand for materials and machinery high, and to government policies that promote industrial growth. It is ironic that PRC investment rates and share of manufacturing have increased substantially after it abandoned the Big Push discussed earlier (World Bank 2007; United Nations National Accounts Database).

Table 2 provides a comparative snapshot of the manufacturing sectors of the PRC and India for 1980–2005. PRC performance in the manufacturing sector surpassed that of India on every count during this period. PRC manufacturing output in value-added terms increased nineteenfold between 1978 and 2005 (from $47 billion to $882 billion), whereas India's manufacturing sector grew fivefold during the same period ($24 billion to $123 billion). The difference in growth rates is even starker when one includes the fact that the PRC started from a much higher base in 1980.

Even during individual 5-year periods, the PRC manufacturing growth rate has been significantly higher than that of India. The only period in which performance—as measured by output growth—was comparable was during 1985–1990, when the India manufacturing sector recorded its best performance (since 1980) due to a combination of newly liberalized industrial policies and a statistical base effect, caused by low productivity in the period immediately preceding it. PRC performance during 1985–1990 was subpar as policy makers tried to slow down the runaway economic growth that had resulted in high levels of inflation, thereby narrowing the performance gap between the manufacturing sectors of the two countries. On the other hand, the difference in performance was most noticeable during 1990 and 1995, when the PRC manufacturing sector completely outperformed that of India mainly due to a surge in FDI. India's slow growth during this period, resulting from the combined adverse impact of the Gulf crisis and macroeconomic stabilization policies introduced in India in response to an economic crisis that erupted in 1991, exacerbated the difference in performance.

Growth rates in the PRC manufacturing (10%–11%) seen after the mid-1990s are still among the world's highest. More importantly, they have been sustained consistently despite the high base. For individual years, manufacturing growth rates declined between 1998 and 2001, compared to the trend rates of previous years.

---

5 Several developing countries have had a manufacturing share of GDP at levels comparable to the PRC. Examples are Brazil (35% in 1982), Malaysia (33% in 2000), and Thailand (35% in 2003). However, none of these countries reached the PRC level of concentration or sustained it for as long.
The People’s Republic of China’s Manufacturing Sector since 1978: Implications for India

Since the mid-1980s, the PRC has deliberately followed a growth strategy driven by exports of manufacturing goods. The PRC has been remarkably successful in this regard, dominating global markets in several labor-intensive, low-technology goods and increasingly in goods of intermediate sophistication. The entry of foreign-owned firms into manufacturing in 1992 has accentuated this trend. There was a noticeable decline in the mid- to late 1990s due to a combination of factors, such as industrial reorganization of SOEs and the 1997/98 Asian financial crisis, which lowered the demand for PRC-manufactured exports. Manufacturing exports have increased since 2000 due to rising global demand and increased PRC consolidation in the global supply chain.

Additional reasons for the decline could be the base effect (i.e., the difficulty of sustaining a high level of growth) and increased competition from low-wage Southeast Asian countries, which have comparable national core competencies.

Table 2: Comparison of the Manufacturing Sector in the People’s Republic of China and India, 1980–2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRC ($ billion, 1990 prices)</td>
<td>47.0</td>
<td>92.3</td>
<td>143.4</td>
<td>323.6</td>
<td>525.9</td>
<td>881.6</td>
</tr>
<tr>
<td>CARG (%)</td>
<td>14.4</td>
<td>9.2</td>
<td>17.7</td>
<td>10.2</td>
<td>10.9</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>23.9</td>
<td>33.5</td>
<td>49.6</td>
<td>69.4</td>
<td>88.8</td>
<td>123.0</td>
</tr>
<tr>
<td>CARG (%)</td>
<td>7.0</td>
<td>8.2</td>
<td>6.9</td>
<td>5.1</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRC ($ billion)</td>
<td>9.0</td>
<td>13.5</td>
<td>46.2</td>
<td>127.3</td>
<td>223.7</td>
<td>712.9</td>
</tr>
<tr>
<td>CARG (%)</td>
<td>8.5</td>
<td>27.9</td>
<td>22.5</td>
<td>11.9</td>
<td>26.1</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>4.5</td>
<td>4.8</td>
<td>12.0</td>
<td>20.4</td>
<td>29.7</td>
<td>60.7</td>
</tr>
<tr>
<td>CARG (%)</td>
<td>1.5</td>
<td>20.0</td>
<td>11.3</td>
<td>7.8</td>
<td>15.4</td>
<td></td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRC (million)</td>
<td>59.0</td>
<td>74.1</td>
<td>86.2</td>
<td>98.0</td>
<td>80.4</td>
<td>83.1b</td>
</tr>
<tr>
<td>CARG (%)</td>
<td>4.7</td>
<td>3.1</td>
<td>2.6</td>
<td>(3.9)</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>27.7</td>
<td>32.5</td>
<td>35.0</td>
<td>40.8</td>
<td>47.8</td>
<td></td>
</tr>
<tr>
<td>CARG (%)</td>
<td>3.3</td>
<td>1.2</td>
<td>2.6</td>
<td></td>
<td>3.2</td>
<td></td>
</tr>
</tbody>
</table>

CARG = compound annual rate of growth, PRC = People’s Republic of China.

a Figures for India are for the financial year (April–March).
b 2002 data.

While export-oriented manufacturing has certainly helped the PRC by way of generating employment and alleviating a balance of payments crisis that emerged in the mid-1980s, there is a growing realization that the PRC may have paid a very heavy price for such an approach. As mentioned, PRC-manufactured exports compete mainly in the labor-intensive, mass-produced goods segment, where international competition is intense. It has resulted in the already meager profits of PRC firms being squeezed, leaving few resources to invest in research and development or capital upgrading. Wages have been similarly affected. The consequence is that several PRC manufacturing firms find themselves trapped in a vicious cycle of low-level, labor-intensive operations, competing solely on the basis of cost.

On the other hand, the strategic focus of India’s manufacturers had been, until recently, on the domestic market, both due to the large market size and government policies that did not explicitly promote exports, as in the case of the PRC. The role of FDI in India’s manufacturing sector has also been limited to date, in comparison with that in the PRC. Policy orientation toward exports has changed in recent years, and the results are beginning to show.7

Average employment in the PRC manufacturing sector has grown at a slower rate than output but still has contributed to poverty reduction. At its peak in 1995, when the PRC economy registered its highest growth, the manufacturing sector employed 98 million people. There was a decline of almost 20% (or 18 million in absolute numbers) between 1995 and 2000, largely due to massive layoffs from SOEs, but average employment in manufacturing showed signs of a revival during 2002, the last year for which data are available (National Bureau of Statistics 2006).

Although the years in Table 2 are not identical for the PRC and India, the PRC’s manufacturing sector employed far more people than India over the period of study. Indeed, the PRC manufacturing sector employed more people in 1980 than that of India in 2005. This clearly reflects the differences in policy priorities where employment in manufacturing is concerned.

**Contribution to Trade**

The manufacturing sector has made a significant contribution to the PRC’s trading profile as shown in Figure 3. When the PRC first adopted an export-oriented growth strategy in the early to mid-1980s, export earnings to cushion imports were an important consideration. The situation has changed dramatically—the PRC’s foreign exchange reserves were almost $1.9 trillion at the end of 2008.

In the early 1980s, the composition of exports changed rapidly from being dominated by petroleum to one dominated by light manufacturing. The sharp increase in exports—beginning in the late 1980s—was due to a combination of factors, such as the Coastal Development Strategy, contribution of export processing zones, and participation of foreign-owned enterprises in the PRC’s manufacturing sector.

---

7 A 2005 Confederation of Indian Industries–McKinsey report, *Made in India*, concluded that with the correct mix of incentives and policies, such as reform of tax laws and labor policies, better infrastructure, and encouragement of cluster formation, India can emerge as a manufacturing powerhouse to rival the PRC, with potential exports of $300 billion by 2015.
The rate of increase of exports slowed down in the mid-1990s due to a 30% real appreciation of the renminbi between 1994 and 1997 and the 1997/98 Asian financial crisis, which lowered demand for PRC exports. Exports have grown at an average annual rate of 20% a year since 2002, as have imports. However, the value of exports far exceeds that of imports, which has resulted in a positive trade balance.

**Regional Distribution of Industry**

Table 3 gives the regional distribution of industry in the PRC in 2004. The table includes the top 10 industrial regions in terms of gross industrial output and employment in industry. The 10 regions collectively account for over three-fourths of gross industrial production and 70% of industrial employment. These regions are also the most prosperous in the PRC, with per capita incomes in some regions, such as Guangdong, approaching middle-income Western levels.

PRC industrial policy of locating or encouraging industrial investment in certain select regions has exacerbated imbalances that existed in 1978. These regions were already among the PRC’s more developed regions when reforms were initiated. The PRC reformers deliberately chose these regions with the expectation that the new policies had the best chance of succeeding there due to favorable endowments, particularly with respect to infrastructure, compared to other PRC regions. It was also hoped that success in the coastal regions would gradually spill over to other regions as a matter of course. However, redistributive effects have not been encouraging. Regional differences have widened, worrying policy makers. Investment continues
to favor the eastern seaboard and the Pearl River Delta Region, despite rapidly rising wages and government incentives to locate in interior regions.

Table 3: Regional Distribution of Industry in the People’s Republic of China, 2004

<table>
<thead>
<tr>
<th>Region</th>
<th>Gross Industrial Output Value (CNY billion)</th>
<th>Share in National Total</th>
<th>Employment (million)</th>
<th>Percent of National Average of Employed Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangdong</td>
<td>3,152.0</td>
<td>14.2</td>
<td>13.4</td>
<td>14.4</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>2,947.7</td>
<td>13.3</td>
<td>10.2</td>
<td>11.0</td>
</tr>
<tr>
<td>Shandong</td>
<td>2,467.9</td>
<td>11.1</td>
<td>9.4</td>
<td>10.1</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>2,122.7</td>
<td>9.6</td>
<td>8.6</td>
<td>9.3</td>
</tr>
<tr>
<td>Shanghai</td>
<td>1,459.4</td>
<td>6.6</td>
<td>3.4</td>
<td>3.7</td>
</tr>
<tr>
<td>Beijing and Tianjin</td>
<td>1,209.4</td>
<td>5.4</td>
<td>3.3</td>
<td>3.5</td>
</tr>
<tr>
<td>Hebei</td>
<td>1,019.4</td>
<td>4.6</td>
<td>4.4</td>
<td>4.7</td>
</tr>
<tr>
<td>Henan</td>
<td>923.7</td>
<td>4.2</td>
<td>5.3</td>
<td>5.7</td>
</tr>
<tr>
<td>Liaoning</td>
<td>914.1</td>
<td>4.1</td>
<td>3.5</td>
<td>3.8</td>
</tr>
<tr>
<td>Fujian</td>
<td>751.6</td>
<td>3.4</td>
<td>3.7</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>National Total</strong></td>
<td><strong>22,231.6</strong></td>
<td><strong>76.3a</strong></td>
<td><strong>93.0</strong></td>
<td><strong>70.0a</strong></td>
</tr>
</tbody>
</table>

* Percentage of national total.

Productivity in the People’s Republic of China’s Manufacturing Sector

The spectacular growth of the PRC economy and of the manufacturing sector in particular has aroused interest about the sources of growth. Extensive literature has emerged, providing estimates of productivity trends in the industrial sector (Chow 1993; Borensztein and Ostry 1996; Jefferson, Rawski, and Zheng 1996) and enabling us to reach the following conclusions.

Table 4: Changes in Total Factor Productivity in Industry in the People’s Republic of China, 1952–2005 (Average annual growth)

<table>
<thead>
<tr>
<th>Period</th>
<th>Output Growth</th>
<th>Total Factor Productivity Growth</th>
<th>Capital Contribution (%)</th>
<th>Labor Contribution (%)</th>
<th>Labor Productivity Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1952–1978</td>
<td>10.5</td>
<td>1.6</td>
<td>74.3</td>
<td>10.8</td>
<td>14.9</td>
</tr>
<tr>
<td>1979–1992</td>
<td>8.6</td>
<td>(2.7)</td>
<td>120.9</td>
<td>10.3</td>
<td>(31.1)</td>
</tr>
<tr>
<td>1993–2005</td>
<td>10.5</td>
<td>3.2</td>
<td>70.9</td>
<td>1.1</td>
<td>28.0</td>
</tr>
<tr>
<td>1979–2005</td>
<td>10.0</td>
<td>0.3</td>
<td>92.1</td>
<td>5.1</td>
<td>2.8</td>
</tr>
</tbody>
</table>

* = negative value.
Note: Output growth and total factor productivity growth represent the average annual growth rates over the respective periods.
Total factor productivity growth in the pre-reform period was positive (1.6%). It would probably have been higher but for the disruptions caused by the Great Leap Forward (1958–1961) and Cultural Revolution (1966–1976).

- The early years of the post-reform period (1979–1992) saw a fall in total factor productivity. This fall could be ascribed to a variety of factors, such as the lethargic performance of SOEs due to the absence of incentives to increase productivity and lagged responses of enterprises to respond to reforms in the mid-1980s.
- Total factor productivity has increased since the early 1990s and indeed shows an accelerating trend. This is likely due to the much-higher productivity levels of township and village enterprises (TVEs) and foreign-funded enterprises (FFE), whose share in total output had increased since the early 1990s. The retrenchment of superfluous labor in SOEs in the mid-1990s and the movement of labor from agriculture to the more productive manufacturing sector were other important reasons for this upward swing. Due to intensive capital investment, labor productivity also increased.
- The shift from a factor accumulation-driven growth paradigm to one predicated upon total factor productivity bodes well for the sustainability of PRC economic growth.8

Ownership Patterns

Ownership patterns in PRC industry have undergone a sizeable transformation over the past 3 decades. In 1978, 78% of all output was produced by SOEs, while collectives accounted for the rest. The industrial sector has since undergone considerable reorganization with the share of the state-owned sector dropping to approximately 40% in 2004. The period since 1990 is characterized by two broad trends:

(i) the declining collective contribution of SOEs and collectives, and
(ii) an increasing role played by FFEs in the PRC manufacturing economy.

The sharpest decline in the contribution of SOEs and collectives was between 1997 and 2004 (from 70% of output to 41%). The share of collectives also declined from 38% to 6% of output during that period. This decline in share needs to be interpreted with care, however. Since the early to mid-1990s, the TVE model that worked so well in raising output and absorbing surplus labor during the early 1980s had been under pressure because of a rapidly changing global environment. Several TVEs were privatized in response to these changed conditions (Salient Features of the PRC's Manufacturing Revolution, p. 130). This is reflected in the increased share of “private” enterprises, though in reality it was only an ownership transformation of the same firm.

---

8 For a detailed discussion, see Bosworth and Collins (2007). Several authors advocate caution while interpreting total factor productivity figures for the PRC. Depreciation is not calculated according to standard international accounting conventions. The employment figures are only for the formal sector, while corresponding statistics for the informal sector, itself a significant employer, are hard to find.
An equally significant development has been the growing contribution of FFEs to PRC industrial production. This is a new development for the PRC, which did not allow any private sector industrial activity between 1949 and 1980. The contribution of FFEs to industrial output is almost twice that of the domestic private sector in 2004 (31.5% versus 16.5%). The contribution of FFEs is even more pronounced in the production and export of high value-added goods.

The decline in the relative importance of SOEs is not as one-sided as it would appear at first glance. SOEs still account for 40% of the PRC’s industrial economy—and more importantly—have exclusive control of the commanding heights. Thus, SOEs still dominate many key manufacturing industries such as shipping, coal, oil, power generation, and telecommunications. The remaining 60% has been liberalized and is characterized by intense competition.9 However, even for SOEs within the reserved sector, performance benchmarks are increasingly being implemented. This process is not an abrupt change, but has been proceeding gradually since the 1980s (Jefferson and Rawski 1994). The government has insisted that SOEs meet performance benchmarks, imposed hard budget constraints, and allowed SOEs to retain some of their earnings for investment, particularly to overcome technological obsolescence.10

---

9 For a detailed discussion, see Wen (2002).
10 For a detailed discussion of SOE reform, see Gupta and Palit, p. 167.
Size Profile of the People’s Republic of China’s Manufacturing Sector

As shown in Table 5, approximately 69% of the PRC manufacturing is by small and medium industry. This profile has changed over the 8 years between 1996 and 2004. The contribution of small and medium firms was 60% in 1996, decreasing to 53% in 2001, and increasing gradually to its present level.

Table 5: Distribution of the People’s Republic of China’s Manufacturing Sector by Size

<table>
<thead>
<tr>
<th>Year</th>
<th>Large-Scale Industry</th>
<th>Medium-Scale Industry</th>
<th>Small-Scale Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Enterprises</td>
<td>Total Gross Industrial</td>
<td>Number of Enterprises</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output Value (%)</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>7,057</td>
<td>39.4</td>
<td>16,870</td>
</tr>
<tr>
<td>1997</td>
<td>7,198</td>
<td>39.6</td>
<td>16,740</td>
</tr>
<tr>
<td>1998</td>
<td>7,558</td>
<td>41.3</td>
<td>15,850</td>
</tr>
<tr>
<td>1999</td>
<td>7,864</td>
<td>43.4</td>
<td>14,371</td>
</tr>
<tr>
<td>2000</td>
<td>7,983</td>
<td>44.7</td>
<td>13,741</td>
</tr>
<tr>
<td>2001</td>
<td>8,589</td>
<td>47.0</td>
<td>14,398</td>
</tr>
<tr>
<td>2002</td>
<td>8,752</td>
<td>46.2</td>
<td>14,571</td>
</tr>
<tr>
<td>2003</td>
<td>1,984</td>
<td>34.4</td>
<td>21,647</td>
</tr>
<tr>
<td>2004</td>
<td>2,135</td>
<td>31.3</td>
<td>25,557</td>
</tr>
<tr>
<td>2006</td>
<td>2,685</td>
<td>35.5</td>
<td>30,245</td>
</tr>
</tbody>
</table>


Government policies have played a vital role in enabling at least a fraction of PRC enterprises to acquire size rapidly. Manufacturing firms in several developing countries have no incentive to scale up and be categorized as large because regulations and taxes are imposed only among the large, formal sector firms (Tybout 2000). General evidence on the impact of firm size on productivity is mixed and conditional. Wing and Yiu (1997), in a study on the impact of firm size on performance of manufacturing firms in Shanghai, reported a high level of technical efficiency for small firms (employing up to 99 workers) as well as for large firms (with over 1,000 workers). Midrange firms (between 100 and 999 workers) displayed lower levels of efficiency. Similar results have been reported for other countries as well (Schneider 1991; Doi 1992). The scaling-up argument needs to be rendered with caution, though. Broadly, the acquisition of scale economies seems to have benefited PRC firms, at least of the export-oriented variety.

---

11 PRC data sources do not clearly state the criteria that distinguish firms on the basis of size. This makes comparisons with similar firms from other countries difficult.
12 This phenomenon was independently confirmed for manufacturing firms in Peru by de Soto (1989).
Salient Features of the People’s Republic of China’s Manufacturing Revolution

This section identifies some of the more conspicuous factors that contributed to the dramatic rise of the PRC as a manufacturing hub in the span of barely 2 decades. These policy measures are broadly interlinked, and expectedly, have evolved in response to changing domestic and global conditions over the past 3 decades. Additionally, while these facets have much in common with policies adopted in East Asia during the 1970s and 1980s, they also have a distinct PRC character to them.

Liberalization of Agriculture

The PRC’s first attempts at liberalizing its agriculture sector were modest compared to what followed. The Third Plenum in 1978 adopted two new policies: an across-the-board increase in procurement prices, and the transfer of management responsibilities to collectives. The higher procurement prices not only increased rural incomes, but also facilitated the procurement process, as the need to coerce surplus grain out of farmers diminished.

The collectives used their newfound autonomy to introduce incentive systems (work points) to reward performance. Individual farmers responded enthusiastically, resulting in further increases in food grain production. The introduction of the household responsibility system (household contracting) in 1981–1982 led to explosive growth in food grain production. Output of food grains grew at 4.1% per year between 1981–1982 and 1985–1986, compared to 2.2% over the previous decade (Naughton 2007). The cornerstone of the household responsibility system was the dual-pricing system, whereby farms had to sell a pre-decided proportion of their output to the government at state-fixed prices but were free to sell the remainder at market prices.

The literature is divided on how exactly the reallocation process of redistributing surplus labor from agriculture to manufacturing took place. The traditional explanation is essentially that of a bottom-up process, characterized by movement to a less labor-intensive pattern of agriculture, and in the process, releasing excess labor to move to nonagricultural activities. The increase in productivity—and hence rural incomes—stimulated demand for consumer goods, which was met by rural enterprises.

More recent studies have challenged the above explanation as partial, at best. Accordingly, the growth of the manufacturing sector—especially in the coastal areas—was not only due to a smooth transition of agricultural workers into manufacturing, but was largely due to rural migrant workers, who according to some estimates, have a nationwide strength of nearly 100 million, or roughly two-thirds of the total industrial workforce (Tang 2008). These workers, despite residing in urban settings, are still classified as rural workers, and hence, do not have access to social benefits.

Collectives (later grouped into communes) were the most dominant form of economic organization in rural PRC until the early 1980s. Collectivization of agriculture began in the mid-1950s, and by the end of the decade, collectivization of agriculture was complete. Collectives performed a variety of agricultural and nonagricultural activities. Privatization of collectives was first introduced on a small scale in the early 1970s, while a full-fledged incentive structure—aimed at raising agricultural productivity—was introduced a decade later.
available to the average urban worker. They are not drawn to urban areas by better employment prospects but migrate due to the malfunctioning of the fiscal and redistributive system. An obvious consequence is that the excess supply of labor pushes down wages, which predominantly explains the vast pool of cheap labor associated with the PRC in mainstream literature. Despite the economic benefits of this resource, it is still a challenge for the PRC to devise a more inclusive social policy that would also include migrant workers.

The Rise of Township and Village Enterprises

Township and Village Enterprise Structure
TVEs were essentially small and medium-sized enterprises that proliferated in select areas of rural PRC in the late 1970s. The structure and ownership patterns of TVEs were quite diverse and were a nimble response to prevailing local conditions.

Collective TVEs at one time dominated the entire TVE sector, and even after the entry of private firms in the 1980s, employment in collective TVEs continued to increase until 1995. Several explanations have been offered for the widespread public ownership of TVEs. On one extreme, public ownership of TVEs was interpreted as a result of a unique PRC cultural characteristic that emphasized cooperation and thereby enabled local actors to resolve incentive problems without explicit contracts. This was true in early days, when the lack of labor mobility meant that local actors needed to interact with each other repeatedly (Weitzman and Xu 1994). An alternative explanation (Chang and Wang 1994) saw TVEs as adaptations to political constraints, insecure property rights, and underdeveloped markets. It is unlikely, given the diversity of milieus in which TVEs operated, that a one-size-fits-all theory of TVE structure could be formulated. However, in no other transitional economy did public enterprises play the same transformative role that TVEs did in the PRC.

Contribution of Township and Village Enterprises
The literature on the contribution of TVEs to PRC economic growth is so exhaustive14 that it would suffice to highlight the conspicuous contributions of these enterprises to PRC economic growth. For close to 2 decades, TVEs were the most dynamic component of the PRC economy. In value-added terms, the contribution of TVEs more than quadrupled, from 6% of GDP in 1978 to 26% in 1996. More importantly, they helped reduce unemployment and, in the process, lifted millions out of poverty. By adopting the appropriate mix of factor ratios, TVEs were able to boost rural employment from 28 million in 1978 to 135 million in 1996.

TVEs increased rural incomes, absorbed surplus labor from agriculture, reduced the wide rural–urban gaps prevalent in the PRC, and helped mitigate the problem of undersupply of consumer goods typical of a controlled economy. The increase in rural incomes further stimulated demand for consumer goods, which led to existing TVEs augmenting capacity in addition to new players who sought to tap rising demand. This virtuous cycle led to the foundation for scale economies that were to drive PRC export-led growth.15 More broadly, as a result of the new competition policy, TVEs forced SOEs to make their operations more efficient. This led to tremendous increases

14 See Byrd and Lin (1990) for an exhaustive review.
15 The availability of credit also helped the scaling-up process.
in overall productivity in the manufacturing sector as a whole in the PRC. The development of the labor-intensive, export-oriented model—driven by economies of scale that was subsequently employed by the PRC with great success—originated in the TVE experience.

**What Made Township and Village Enterprises So Successful?**
The development and rapid growth of TVEs were in response to prevailing economic conditions in the PRC in 1978. The availability of surplus labor—as a consequence of the reallocation from agriculture to rural migrant workers coupled with pent-up demand for consumer goods—provided favorable initial conditions for TVE growth in the early years of reform. In this subsection, two other factors that contributed significantly to the growth of TVEs are discussed.

**Township and village enterprise structure and business model.** TVEs were perceived by the PRC authorities as essentially low-technology firms whose services were highly localized. As a result, TVEs were excluded from the plan unlike SOEs, which provided TVEs with a great deal of autonomy. TVEs were able to develop eclectic business models that allowed them to be extremely adaptive. The most significant implication of this flexibility was with regard to ownership. Several new TVEs that started after the mid-1980s were registered as collectives for ideological reasons, but were run as de facto private firms. These arrangements enabled the creation of new incentive structures that, in turn, led to much higher levels of productivity and dynamism within the sector.

TVEs employed factor ratios that reflected the PRC’s true factor endowment, by adopting a labor-intensive growth strategy. In the late 1980s, TVEs had a labor–capital ratio that was nine times that of SOEs. This was consistent with the dominant reform agenda of providing industrial-level employment to millions as a poverty reduction strategy.

**Government policy toward township and village enterprises.** The attitude of the government toward TVEs was mixed. On the one hand, TVEs received no leeway in the form of cheap credit, but had to rely on their own resources to support their investment plans, inadvertently helping TVEs choose the appropriate factor mix. Investments by TVEs were financed through borrowing at market rates or through retained earnings, which entailed an opportunity cost. Denial of cheap credit forced TVEs to be not only extremely efficient, but discouraged a capital-intensive growth strategy.

On the other hand, the government liberalized its competition policies to enable TVEs to compete in markets that were historically monopolized by SOEs, thereby enabling them to share monopoly profits. Market liberalization provided TVEs with access to a much larger market, accelerating the scaling-up process. The government also contributed to TVE growth by providing generous tax credits. The average tax rate on profits was set at 8% in 1978, declined to 6% in 1980, and has remained unchanged at 20% since 1986. However, a significant proportion of profits had to be paid to local governments, which retained them locally since they were considered

---

16 This is an anomalous situation where treatment of TVEs vis-à-vis SOEs is concerned. SOEs received generous credit facilities but had to pay very high taxes to the central government, sometimes as high as 100% of earnings.
extrabudgetary and did not have to be shared with the central government. These tax revenues were put back into public works, mainly in the form of infrastructure and often back into the TVE itself.

As a result, TVEs rapidly gained size and were not undercapitalized as is the case with comparable firms in developing countries. This was arguably the biggest boost to the mass manufacturing revolution that was to follow over the next few decades.

**Decline of Township and Village Enterprises**

The period from 1978–1996 is described as the golden age of the TVE sector. However, a rapidly changing economic environment considerably diminished the innate advantages that TVEs possessed in the early 1980s. A shift in national priorities toward building markets and institutions, more restrained macroeconomic policies directed at controlling inflation, and greater financial independence and accountability for banks meant that TVEs faced a tougher operating environment.

The PRC’s increasing openness concomitantly increased exposure to global forces. Urban firms were forced to expand beyond their traditional niches and adopt nationwide strategies, which inevitably brought them in direct competition with TVEs. The chronic scarcity of consumer durables prevalent in pre-reform PRC had largely been eradicated by the early to mid-1990s, and as a result, the unique positioning that had contributed to TVE growth was considerably diminished. Finally, rising incomes made the average PRC consumer more discriminating, demanding higher-quality products than what TVEs with their outdated technologies could provide. These factors precipitated a decline in the relative importance of TVEs in the national economy, and more importantly, ushered an evaluation of the fundamental tenets of the TVE model, particularly the ownership structure. The existing models were seen as having reached their limits. Privatization of TVEs seemed the inevitable next step.

**Privatization of Township and Village Enterprises**

Public ownership of TVEs worked well in the early years under a set of uniquely PRC institutional and cultural conditions (Liberalization of Agriculture, p. 130). However, changes in the external economic environment reduced the benefits and increased the costs of public ownership. Several domestic firms, which were later entrants, were de facto privately owned as early as the mid-1980s. The early 1990s saw official policy toward private ownership turn benign and even encouraging, with easing of restrictions on private ownership. This reduced the need for private firms to masquerade as collective to avoid official reproach.

Privatization of TVEs has proceeded irreversibly, with only 10% of the TVE labor force still employed in publicly owned enterprises as of 2006. The process of privatization has drawn charges of favoritism in the form of insider trading but has proceeded without disruption.

In conclusion, TVEs dramatically transformed the PRC economic landscape by absorbing surplus labor, helping address problems of scarcity of consumer goods, laying the foundation for export-oriented mass manufacturing, and in later years, being in the vanguard of the privatization process. A limitation of the TVE model was its restricted spread; vast swaths of rural PRC were untouched by TVE development. It is no coincidence that these areas are among the poorest in the PRC.
Economies of Scale

The PRC manufacturing sector (especially the export-oriented mass manufacturing component) is characterized by scale—the ability to engage in large-scale production at relatively low marginal costs. The bases of this large-scale production are (i) a trained and disciplined labor force, (ii) process standardization, (iii) large-scale procurement system, and (iv) ability to generate large volumes (Chandra and Sastry 2002).

The PRC’s emphasis on generating economies of scale has several advantages, both in the form of direct and indirect economies. Direct economies are manifested as lower average production, transport, and transaction costs. These advantages have enabled the PRC manufacturers to adopt a strategy of large volumes and low margins, which is crucial in obtaining the market share in export markets characterized by intense price competition.

The benefits of indirect economies are also substantial. Large output volumes and standardized production processes have enabled producers to negotiate lower input and component costs with suppliers aggressively, increasing their competitiveness. PRC manufacturers routinely procure through common agents, obtaining volume purchase and volume discounts. Suppliers assured of a market have been able to specialize and upgrade capital stock continuously, which has contributed to their productivity. Mass production by its very nature involves much wear and tear; the average age of equipment in the PRC is 6 years. Technological advances are embedded in the latest technology, and one could reasonably conclude that the process of capital accumulation in the PRC is not merely physical but is aimed at improving the quality of capital stock. Mass production in the PRC has strong feedback loops within the economy in stimulating demand for capital goods.

The policy of encouraging production to locate in clusters contributed to the rapid development of forward and backward links. Suppliers assured of a solid customer base have scaled up to meet predicted demand and, in the process, have lowered their own marginal costs of production.

Labor Reforms

There was no labor market in the PRC under the command economy. An employee was a member of an all-encompassing system of public employment. In the final years of the command system, the large majority of the PRC workforce was in publicly owned undertakings, of which two-thirds were in agriculture, and the rest in assorted economic activities. The employment system was characterized by two basic facets: job security and the utter absence of mobility. The government controlled virtually all hiring decisions and allocated people to jobs, rarely in consonance with their skills and abilities. Strict restrictions on movement, especially from rural to urban areas, further curtailed mobility.

This resulted in SOEs being saddled with extensive redundant labor, which was not unusual for centrally planned economies. SOEs were not seen as profit maximizing firms, but institutions designed to maximize social welfare. Low levels of efficiency in SOEs led to losses that were eventually subsidized by the government.
PRC policy makers realized that labor market rigidity was a severe handicap that was slowing the transition to a market economy. As a result, an important thrust area for the economic reform agenda at the microeconomic level was the rationalization of the labor force, particularly in SOEs. The first concrete step in this direction was the introduction of the contract labor system in the mid-1980s. While stipulations of this new legislation applied essentially to newly formed firms, it signaled a radical change from pre-reform policies that virtually guaranteed lifetime employment. Under it, firms could hire workers depending on perceived need and lay them off in the event of a downturn. This flexibility had far-reaching effects for the PRC economy in that it allowed newly formed enterprises to scale up aggressively—new firms could freely hire labor without having to worry about retaining them in the event of a downturn.

This new flexibility introduced a new dynamism to the labor market. The rapid growth of the economy meant that laid-off workers were often able to find comparable work in another enterprise. In the early 1990s, the government extended these flexible labor policies in combination with other enterprise reforms—such as hard budget constraints, greater autonomy to managers, and wage flexibility—to SOEs in a bid to improve their bottom lines, which were being adversely impacted because of a bloated labor force. This resulted in the layoff of over 25 million SOE workers between 1996 and 2002. The policy called Xiagang referred not merely to layoffs from SOEs, but also to the post-layoff rehabilitation process. Zhang (2003) outlined a comprehensive three-stage rehabilitation program to assist workers affected by the SOE layoffs. The first step includes retraining and skill augmentation through reemployment service centers. Workers who cannot find jobs 3 years after being retrained are covered by unemployment insurance and, at the end of their eligibility period, are provided with welfare support from the Minimum Living Standard Guarantee Program.

These social security programs are welcome because they provide a safety net to millions of displaced workers, mitigating potential social tensions caused by large-scale layoffs. However, the effectiveness of the programs varies widely by region, e.g., certain cities like Shanghai have implemented these programs very effectively, while smaller towns have been constrained by lack of resources. In any case, they are overwhelmingly biased toward the urban worker. Rural workers largely have to fend for themselves while still being faced with a repressive hukou system.

PRC policy makers are faced with a peculiar policy dilemma created by the evolving labor market. On the one hand, excess supply of PRC labor suggests labor productivity will continue to grow at a faster rate than labor costs. PRC authorities have enacted labor market reforms in an attempt to link wages to productivity, but with limited success. On the other hand, rising wages could eventually erode the PRC’s comparative advantage in cheap labor, something PRC policy makers may be reluctant to forego. The next set of labor reforms will have to find a way to address this problem.

---

17 Official government statements claim that close to three-quarters of those laid off during the mid- to late 1990s found alternative employment. However, the number of formal sector jobs dropped considerably during this period, which suggests that the new jobs were mainly in the informal sector (Naughton 2007, 187).

18 The hukou system has been progressively relaxed, but restrictions on rural–urban migration remain.
Human Capital

The commitment of successive governments to increase the stock of human capital never faltered, even during periods of massive political upheaval. For example, even when the university system was virtually shut down during the Cultural Revolution, investment in primary education was largely unaffected, leading to a decline in illiteracy. As early as 1982, two-thirds of the population was literate, and basic industrial skills were widely disseminated. This helped the reallocation process from agriculture to industry.\footnote{The PRC achieved notable success with other human development indicators, such as life expectancy and infant mortality, as well. However, a detailed discussion is beyond the scope of this paper.}

While the socialist system did a fine job of providing basic education to broad sections of the population, it did not create a system of incentives that rewarded individuals for upgrading their skill levels. Several studies (Psacharopoulos and Patrinos 2002; Zhang et al. 2005) found that higher levels of education did not always guarantee higher incomes, even within similar professions. In other words, the private returns to education were low.

Given the low returns to education, individuals had no incentive to invest in higher education due to the fundamental misalignment between increases in social productivity and individual rewards. Returns to education are a good indicator of the maturity of domestic labor markets, and recent studies seem to suggest that the PRC may actually be moving forward in this regard. Zhang et al. (2005) found that through the 1990s, an individual worker in the PRC could enhance his or her income by 4\%–5\% for every additional year of schooling completed. While the return to education was still lower than the world average of 10\%, it was an improvement over the past. Returns to education have increased even further since 2000 and now are close to 10\%, which is close to the world average. Foreign-funded enterprises (FFEs) are also bidding up the wages of individuals, especially with management training and/or English language skills, further increasing incentives to invest in education.

Table 6 gives the educational attainment of the population from 1982 to 2004. The most noticeable increase is in the number of individuals with a high school education (includes tertiary and upper-middle). This proportion increased from 10.9\% of the population in 1982 to 22.3\% in 2004 and reflects a policy bias on the part of the PRC planners toward higher education, which suffered especially during the Cultural Revolution. The number of college graduates has tripled from 1 million in 2001 to over 3 million in 2005.
### Table 6: Educational Attainment of the Population (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary (above Grade 12)</td>
<td>0.9</td>
<td>1.7</td>
<td>2.3</td>
<td>4.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Upper-Middle (up to Grade 12)</td>
<td>10.0</td>
<td>9.4</td>
<td>9.4</td>
<td>14.4</td>
<td>15.6</td>
</tr>
<tr>
<td>Lower-Middle (up to Grade 9)</td>
<td>23.8</td>
<td>27.2</td>
<td>31.0</td>
<td>39.1</td>
<td>–</td>
</tr>
<tr>
<td>Primary (up to Grade 6)</td>
<td>30.8</td>
<td>43.2</td>
<td>43.6</td>
<td>32.9</td>
<td>–</td>
</tr>
<tr>
<td>No formal schooling</td>
<td>34.5</td>
<td>18.5</td>
<td>13.6</td>
<td>9.0</td>
<td>–</td>
</tr>
</tbody>
</table>

– = no data available.
Source: Naughton 2007.

The shift in focus toward higher education has resulted in a reduction in the traditional focus on primary education, even though illiteracy continues to decline steadily. The average age of schooling has increased from 6 years in 1990 to a little over 8 years in 2003, which compared favorably with 7 years for Mexico and 10 years for the Republic of Korea. In addition, the government’s commitment to improving the stock of human capital continues, and it has initiated the following steps to bolster educational and training levels in the general population:

- Increase the average age of schooling to 9 years.
- Increase outlays for education from 3% to 5% of GDP by 2009.
- Focus on traditionally disadvantaged groups, such as women in rural areas and children of migrants, who have to attend makeshift schools because of exorbitant fees charged by mainstream institutions.
- Address differences in the quality of education between rural and urban schools.

Despite considerable progress in making education more inclusive and also in increasing the number of highly educated workers, much more needs to be done, especially in the areas highlighted above. However, the improvement in the returns to education is at least partially responsible in explaining the rapid increase in educational attainment over the past decade. Increased participation at both ends of the educational pyramid (especially in the dissemination of industrial skills) bodes well for the PRC as it attempts to consolidate its position as a manufacturing powerhouse and also to move up the technological ladder through enhanced capabilities.

### Ownership Reform

The literature on the impact of ownership change on PRC productivity broadly suggests that privatization has improved firm performance. While firms that were privately owned (both domestic and foreign) were forced to be efficient from the outset largely because they were faced with intense market competition, emerging evidence suggests that
privatization of SOEs has improved their performance. Song and Yao (2004), in a study of 683 state-owned firms, found that privatization positively impacted profitability (defined as return on capital) but had tepid effects on unit costs and labor productivity. Dong and Pandey (2007), in a comparative study of the impact of labor reform and ownership restructuring on the manufacturing sectors of the PRC and India, reported that these two factors collectively explained 30% of the productivity increases in the PRC. Ownership change contributed more to productivity improvements than to labor reform. This is an impressive development, given that in the PRC, the worse-performing SOEs were put up for restructuring (Dong, Putterman, and Unel 2004).

It could be concluded that microeconomic reforms did positively enhance productivity, though the process of reform needs to continue.20

Foreign Direct Investment

The *Kaifang Zhenze* (Open Door) Policy, welcoming foreign investment in the PRC after nearly 3 decades of isolation, was probably the most profound and far reaching of all individual reforms enacted since 1978. The Fifth National People’s Congress in 1979 passed the Law of the People’s Republic of China on Joint Ventures Using Chinese and Foreign Investment, formally granting legal status to foreign investment.

The extensive literature on FDI identifies several benefits that FDI can confer on host countries. FDI brings a bundle of management experience, marketing channels, and technology, in addition to the basic inflow of resources (Dunning 1973; Loungani and Razin 2002). The PRC’s motivations for inviting foreign capital were quite similar to these. FDI in the PRC has three distinctive characteristics:

- It has been the predominant form in which the PRC has accessed global capital.
- FDI has predominantly been directed toward the manufacturing sector, as opposed to services or extractive industries in other developing countries.21
- FDI inflows have traditionally been from other East Asian countries and areas, especially Hong Kong, China and Taipei, China.

The increase in FDI inflows to the PRC over the past 3 decades has been dramatic. FDI inflows have grown from barely a trickle in the early 1980s to about $79 billion in 2005, making the PRC one of the top two FDI recipients in the world and by far the biggest destination among developing countries. FDI inflows to the PRC in 2005 were one-third of all inflows to developing countries (UNCTAD 2006).22

The growth rate of FDI has been slower than that of GDP, so the share of FDI in the GDP has actually been decreasing since the late 1990s. The FDI–GDP ratio increased from 1% of GDP during the 1980s to a peak of 6% in 1994, decreased to 5% in 1996, and remained at that level until 2002, when it fell to 3% for the first time since

---

20 See Gupta and Palit (p. 167) for more details.
21 Of inflows in 2004 and 2005, 70% were directed toward the manufacturing sector, while services accounted for 27%. For other developing countries, the average respective figures are 38% and 55%.
22 PRC FDI inflow statistics need to be interpreted with caution, as PRC authorities follow nonstandard accounting practices to account for FDI inflows. A more serious problem is that of “round tripping” in which PRC domestic capital returns as FDI to avail of tax concessions and other benefits. Estimates of round tripping range from 20% to 50% of total inflows.
1992 (UNCTAD 2006). This ratio is comparable to that of developing Southeast Asian countries, such as Indonesia, Malaysia, the Philippines, and Thailand, where inflows have been of the order of 4% of GDP, though the latter are much smaller economies compared to the PRC. The PRC is a lot less dependent on FDI for capital formation, as its own domestic savings rate exceeds 40% of GDP.

**Time Line of Policy Changes**

PRC policy makers moved to create an enabling environment to attract FDI through a series of policy measures and institutional changes (Chen et al. 2002; Tuan and Ng 2004).23 Tuan and Ng classified the reforms into three stages, which evolved sequentially:

- **Initial development.** Fundamental institutional reforms at the national level (1979–1986), involving the creation of institutional infrastructure, laid the legal foundation for FDI and the removal of ideological constraints.
- **Consolidation.** Reforms, toward a market economy (1987–1991) and emerging as a transitional state, had a regional orientation and focused on specific policies to encourage inflows.
- **Fast development.** Beginning in the early 1990s, these reforms were mainly concerned with FDI absorption via the creation of agglomeration economies.

The investment regime has continued to evolve and is generally investor-friendly. Taxes are moderate, and investment protection treaties protect foreign investors from sudden expropriation of assets. The currency is convertible on the current account, and profits can be repatriated easily. However, despite tremendous progress made in setting up a legal and institutional environment to assist foreign investors, there remains room for improvement. Intellectual property rights violations are common, and the institutional environment is still complex.

**Empirical Determinants of Foreign Direct Investment**

Extensive literature identifies factors that attract FFEs to host countries. Most of the literature was developed in the context of developed countries, as most FDI to date is from developed countries to other developed countries. However, the results can be extended to flows from developed countries to developing countries as well.

There is tremendous diversity in the nature of studies on the empirical determinants of FDI.24 The determinants are usually a mix of economic factors such as GDP, GDP per capita, wage levels, inflation and unemployment rates, measures of the quality of physical infrastructure, and membership in regional trade agreements; social indicators such as literacy rates; and measures of institutional development such as corruption levels.25

---

23 Refer to Table A.8 for a comprehensive list of FDI-related policy and institutional changes.
24 Country-level studies range from the most common country cross-section studies, which pool data across various countries, to studies that seek to identify the determinants of FDI for a particular country. There is also a class of micro-level studies that identifies the determinants of FDI in a sector, either for a single country or a cross section of countries.
25 The list of determinants above is comprehensive, but not exhaustive. For detailed studies see Dunning (1973), Singh and Jun (1995), Moosa (2002), and Kinoshita and Campos (2003).
A body of literature has sought to answer these questions specifically for the PRC. Zhang (2001) identified market size, the availability of agglomeration economies (measured as a share of manufacturing in a province’s GDP), quality of transport (measured by density of rail and road networks in a province), literacy rates, and openness of the economy as statistically significant predictors of FDI. These results were supported by Cheng and Kwan (2000) and Ali and Weishi (2005).

The literature has proposed a typology for inflows based on whether the investment is directed at export markets or the domestic market. Vertical FDI involves moving part or all of a production process to a host country to export components or finished products back to the home country or to a third country or countries. FDI directed at the domestic market is referred to as horizontal FDI.

Vertical FDI is generally associated with the labor-intensive, export-oriented manufacturing sector seen in the PRC and in Southeast Asian countries. By its very nature, it is drawn to countries with low wage levels and quality of physical and human capital. Horizontal FDI, however, is concerned mainly with market size.

Vertical FDI generates more lasting forward and backward links within the host country, and hence, was the preferred mode of FDI in East Asia. The PRC adopted a similar policy toward FDI, severely restricting access to the domestic market to foreign firms during the early years. It was only after 1992 that foreign firms were allowed access to the domestic market.

**Impact of Foreign Direct Investment**

As shown in Table 7, FDI in the PRC has surged dramatically over the past 25 years from barely $60 million in 1980 to $79 billion in 2005. In fact, annual average FDI flows doubled between 2000 and 2005. This increase has been due to a combination of favorable government policies that have been gradually liberalized as well as changing global conditions, especially in developed countries where high wage levels and saturated markets motivated firms to expand operations globally.

PRC investment policy explicitly steered incoming FDI toward the manufacturing sector, as in East Asia during the 1970s and 1980s. The proportion of FDI directed toward manufacturing was approximately 80% for the first 2 decades and currently stands at 70%. The services sector has attracted a correspondingly low share of FDI, but this share is expected to increase following the PRC’s accession to the World Trade Organization.

---

26 “Agglomeration economies” is a term used to describe the benefits that firms derive from locating near each other. It is related to the idea of scale and network effects, in that the more related firms are clustered together, the lower the cost of production and the greater the market that firms can sell into. Lower costs of production result from firms’ ability to access competing suppliers and engage in greater specialization and division of labor.

27 “Home country” denotes the country to which the investing firm belongs, whereas “host country” refers to the country in which the investment is made. Thus, if General Electric were to invest in the PRC, the United States would be the home country, and the PRC would be the host country.


29 The sharp increase in FDI during 2005 is due to a change in accounting practices initiated in that year. PRC FDI statistics since include investments in the banking and insurance sector as well (interview with Ministry of Commerce officials, 2008).
The impact of FDI on the manufacturing sector has been dramatic. The contribution to total output has increased 15 times and accounts for almost one-third of all production. More importantly, as seen in Table 8, it is not restricted to merely labor-intensive, low value-added sectors, but is increasingly evident in high-technology industries as well. The contribution to exports—and especially manufacturing exports—has been equally spectacular. Exports by FFEs are now close to 60% of PRC total exports. The figures are more impressive in high-technology exports, where the share is close to 85% (Steinfeld 2006; Lall and Albaladejo 2004).

These results essentially confirm the positive evaluation of FDI to the PRC manufacturing sector by way of boosting exports (Song and Zhang 2001; Awokuse and Weishi 2007) and, more indirectly, by spurring productivity in the manufacturing sector (Buckley et al. 2002; Chen and Demurger 2002).

Distribution of Foreign Direct Investment Inflows by Industry
Table 8 gives the participation rate of foreign-funded companies in various industries within the manufacturing sector for 2000 and 2005. The data lead to the following observations:

(i) The share of FFEs is overwhelming (i.e., more than 50% of output) only in the electronic and telecommunications industry. The contribution has increased by 13 percentage points between 2000 and 2005 (71% versus 84%).

(ii) There is no established pattern to suggest that FFEs necessarily dominate more technologically sophisticated industries. For example, FFEs contributed 48% to garments and a little over 30% to transport equipment.

(iii) The share of FFEs in output has not changed significantly (i.e., showing a variation of 5 or more percentage points) for most industries between 2000 and 2005. The only industries to have registered significant change are raw chemical materials (+5.00%), chemical fiber (−7.30%), transport equipment (+12.55%), and electronic and telecommunications equipment (+13.00%).
Table 8: Gross Industrial Output Value of Foreign-Funded Enterprises by Industry, 2000 and 2005

<table>
<thead>
<tr>
<th>Industry</th>
<th>2000</th>
<th></th>
<th>2005</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign-Funded Enterprises (CNY billion)</td>
<td>Total (CNY billion)</td>
<td>% of Total</td>
<td>Foreign-Funded Enterprises (CNY billion)</td>
</tr>
<tr>
<td>Food manufacturing</td>
<td>56.4</td>
<td>144.3</td>
<td>39.1</td>
<td>137.7</td>
</tr>
<tr>
<td>Textiles</td>
<td>109.4</td>
<td>514.9</td>
<td>21.3</td>
<td>320.2</td>
</tr>
<tr>
<td>Garments and other fiber products</td>
<td>111.2</td>
<td>229.1</td>
<td>48.5</td>
<td>229.0</td>
</tr>
<tr>
<td>Papermaking and paper products</td>
<td>50.2</td>
<td>159.0</td>
<td>31.6</td>
<td>145.5</td>
</tr>
<tr>
<td>Printing and record medium reproduction</td>
<td>19.8</td>
<td>61.7</td>
<td>32.1</td>
<td>46.8</td>
</tr>
<tr>
<td>Raw chemical materials and chemical products</td>
<td>118.4</td>
<td>574.9</td>
<td>20.6</td>
<td>419.7</td>
</tr>
<tr>
<td>Medical and pharmaceutical products</td>
<td>40.4</td>
<td>178.1</td>
<td>22.7</td>
<td>104.8</td>
</tr>
<tr>
<td>Chemical fiber</td>
<td>43.7</td>
<td>124.3</td>
<td>35.1</td>
<td>72.6</td>
</tr>
<tr>
<td>Plastic products</td>
<td>82.9</td>
<td>190.0</td>
<td>43.6</td>
<td>216.6</td>
</tr>
<tr>
<td>Metal products</td>
<td>96.5</td>
<td>254.0</td>
<td>38.0</td>
<td>239.5</td>
</tr>
<tr>
<td>Transport equipment</td>
<td>162.5</td>
<td>536.5</td>
<td>30.3</td>
<td>673.2</td>
</tr>
<tr>
<td>Electric equipment and machinery</td>
<td>160.3</td>
<td>483.5</td>
<td>33.2</td>
<td>526.5</td>
</tr>
<tr>
<td>Electronic and telecommunications equipment</td>
<td>540.3</td>
<td>755.0</td>
<td>71.6</td>
<td>2,271.2</td>
</tr>
</tbody>
</table>


Modes of Entry of Foreign Direct Investment
Table 9 indicates the changing modes of entry for foreign capital into the PRC between 1985 and 2004. The modes of entry in the early days of economic reform were a mixture of contractual joint ventures, joint development projects, and equity joint ventures. Contractual joint ventures were flexible agreements of association that did not create an enduring legal entity. Foreign firms were linked to a domestic partner partly due to legal necessities and also to leverage the domestic partner’s knowledge of the domestic market. Joint development projects were contractual joint ventures specifically tailored toward oil exploration projects.
Since the mid-1980s, the government actively encouraged equity joint ventures as the preferred mode of FDI entry. This policy was predicated on the belief of a common interest—the foreign firm would reap the benefits of long-term involvement, whereas the PRC side would benefit from sharing information. Such relationships did not work out very well, especially if the domestic partner was an SOE, because of a fundamental misalignment of interests. Foreign firms were interested in profits and increased market share, whereas domestic firms were interested in maintaining employment and accessing foreign technology.³⁰

Table 9: Modes of Foreign Direct Investment in the People’s Republic of China (as % of realized investment)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractual joint venture</td>
<td>34</td>
<td>20</td>
<td>21</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Joint development project</td>
<td>30</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Equity joint venture</td>
<td>35</td>
<td>53</td>
<td>50</td>
<td>35</td>
<td>28</td>
</tr>
<tr>
<td>Wholly foreign-owned</td>
<td>1</td>
<td>20</td>
<td>27</td>
<td>46</td>
<td>67</td>
</tr>
</tbody>
</table>

Source: Naughton 2007.

The most remarkable change in the mode of entry has been the preponderance of wholly foreign-owned firms in the PRC since the mid-1990s. The proportion of these firms has increased from 1% in 1980 to 67% in 2004. Above all, this reflects growing confidence among foreign firms in the PRC’s business environment.

Regional Distribution of Foreign Direct Investment in the People’s Republic of China

Table 10 ranks the top eight provinces by levels of FDI stock for 2005. The eight provinces collectively account for about 83% of FDI stock in the PRC. The pattern seen here is quite similar to that for the regional distribution of industry (An Overview of the Manufacturing Sector in the People’s Republic of China p. 5).³¹

The same provinces have historically been the leading recipients of FDI, though the ranking within the cohort has changed. Guangdong and Fujian provinces have always had an FDI–GDP ratio above the national average of approximately 3% since 1999. The FDI–GDP ratio was 13% for Guangdong and 11% for Fujian for 1993–2003, and inflows were large enough to transform these regional economies.

³⁰ See Naughton (2007), chapter 17 for further details.
³¹ This is consistent with the findings of industrial organization literature that domestic and foreign firms seek and respond similarly to the incentive set.
Table 10: Foreign Direct Investment Stock in the People’s Republic of China, by Province, 2005

<table>
<thead>
<tr>
<th>Province</th>
<th>Total Investment ($ billion)</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangdong</td>
<td>288.9</td>
<td>19.7</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>265.7</td>
<td>18.2</td>
</tr>
<tr>
<td>Shanghai</td>
<td>200.7</td>
<td>13.7</td>
</tr>
<tr>
<td>Beijing and Tianjin</td>
<td>117.5</td>
<td>8.0</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>101.9</td>
<td>7.0</td>
</tr>
<tr>
<td>Liaoning</td>
<td>81.5</td>
<td>5.6</td>
</tr>
<tr>
<td>Shandong</td>
<td>78.6</td>
<td>5.4</td>
</tr>
<tr>
<td>Fujian</td>
<td>75.3</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>National Total</strong></td>
<td><strong>1,464.0</strong></td>
<td><strong>82.7\textsuperscript{a}</strong></td>
</tr>
</tbody>
</table>

\textsuperscript{a} Column total.


Country of Origin Effects
Nonresident Chinese (NRC), especially from Hong Kong, China and Taipei, China, have traditionally been the major investors in the PRC since the open door policy was introduced. NRCs contributed close to 60% of inflows until 1997, when their relative share declined.

The reasons for NRC interest in the PRC were manifold. In the early 1980s, rising educational levels in Hong Kong, China and Taipei, China increased wages for skilled workers in those places. As a result, employers found it difficult to hire and retain labor and started looking for alternative locations. The PRC was looking for investment and was offering extensive concessions for investors to start operations in the PRC, which led to a mutually beneficial situation for both parties. Secondly, NRC investors had family ties to the PRC and were familiar with its traditions and customs, which made routine operations easier.

Most investment from Hong Kong, China and Taipei, China is vertical and directed at international markets, though recently firms have increasingly started targeting the domestic market.

The contribution of investors from Hong Kong, China and Taipei, China goes beyond providing capital and technology. By successfully conducting their business operations, they demonstrated that the PRC was safe for business. In addition, investment by NRCs in the PRC led to a two-way transformation. FDI by NRCs economically transformed the regions where invested, also leading to deep-rooted changes in both Hong Kong, China and Taipei, China. Taipei, China abandoned the low-end manufacturing that had gained it international prominence and moved up the technology ladder, like Japan and the Republic of Korea before it. Hong Kong, China made an even more profound transition to an economy dominated by finance and information technology-enabled services, with only a minor role for manufacturing.

Buckley et al. (2002) made an interesting observation about the comparative spillover impact of firms owned by NRCs and non-Chinese. Firms owned by NRCs are generally in low-technology areas and use mature, standardized technologies.
As a result, technology spillovers from NRC companies are very limited in scope. On the other hand, non-Chinese foreign investors (especially from the United States [US]) are more likely to be capital-intensive, engaged in innovative activity, and share technology locally as they are looking for long-term growth in the domestic market.

FDI from Japan has increased steadily over the past decade and exceeds FDI from the US and the European Union. During the early years of reform, Japanese investors saw the PRC as an attractive—but risky—market, which explained their cautious approach to investing in the PRC. Initial FDI from Japan had a profile similar to that from Hong Kong, China and Taipei, China—labor-intensive and export-driven. Investment was directed toward the production of intermediate or finished goods for intrafirm trade or home- and third-country exports. However, more recent investment from Japan is in higher value-added products such as electronics and automobiles, motivated by the maturation of PRC investment policy (particularly the increased protection offered to investors) and the rapidly growing domestic market. On the other hand, American firms possess strong ownership-specific advantages (mostly in the form of superior technologies) and their investments are directed toward the domestic market. Despite a fall in their own historical inflow levels, NRC inflows are still more than those from the “triad” (Europe, Japan, and the United States).

FDI from the European Union was a little over $5 billion in 2005 and has a qualitative profile similar to that of the US. Other important investors in the PRC are the Republic of Korea and Singapore.32

Table 11: Foreign Direct Investment Inflows to the People’s Republic of China, by Country or Area of Origin ($ billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Japan</th>
<th>United States</th>
<th>Europe</th>
<th>Hong Kong, China</th>
<th>Taipei, China</th>
<th>Macau, China</th>
<th>Nonresident Chinese</th>
<th>Total</th>
<th>Nonresident Chinese as % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>4.3</td>
<td>3.2</td>
<td>4.4</td>
<td>20.6</td>
<td>3.3</td>
<td>0.4</td>
<td>24.3</td>
<td>44.2</td>
<td>55.0</td>
</tr>
<tr>
<td>1998</td>
<td>3.4</td>
<td>3.9</td>
<td>4.3</td>
<td>18.5</td>
<td>2.9</td>
<td>0.4</td>
<td>21.9</td>
<td>43.8</td>
<td>49.9</td>
</tr>
<tr>
<td>1999</td>
<td>3.0</td>
<td>4.2</td>
<td>4.8</td>
<td>16.4</td>
<td>2.6</td>
<td>0.3</td>
<td>19.3</td>
<td>38.8</td>
<td>49.7</td>
</tr>
<tr>
<td>2000</td>
<td>2.9</td>
<td>4.4</td>
<td>4.8</td>
<td>15.5</td>
<td>2.3</td>
<td>0.4</td>
<td>18.1</td>
<td>38.4</td>
<td>47.2</td>
</tr>
<tr>
<td>2001</td>
<td>4.4</td>
<td>4.4</td>
<td>4.5</td>
<td>16.7</td>
<td>3.0</td>
<td>0.3</td>
<td>20.0</td>
<td>44.2</td>
<td>45.3</td>
</tr>
<tr>
<td>2002</td>
<td>4.2</td>
<td>5.4</td>
<td>4.1</td>
<td>17.9</td>
<td>4.0</td>
<td>0.5</td>
<td>22.3</td>
<td>49.3</td>
<td>45.2</td>
</tr>
<tr>
<td>2003</td>
<td>5.1</td>
<td>4.2</td>
<td>4.3</td>
<td>17.7</td>
<td>3.4</td>
<td>0.4</td>
<td>21.5</td>
<td>47.1</td>
<td>45.7</td>
</tr>
<tr>
<td>2004</td>
<td>5.5</td>
<td>3.9</td>
<td>4.8</td>
<td>19.0</td>
<td>3.1</td>
<td>0.6</td>
<td>22.7</td>
<td>54.9</td>
<td>41.2</td>
</tr>
<tr>
<td>2005</td>
<td>6.5</td>
<td>3.1</td>
<td>5.6</td>
<td>18.0</td>
<td>2.2</td>
<td>0.6</td>
<td>20.7</td>
<td>79.1</td>
<td>26.2</td>
</tr>
</tbody>
</table>


32 Japan and the Republic of Korea invest heavily in the northern provinces of Jilin, Liaoning, and Shandong. This investment could help the region in reversing the process of gradual deindustrialization that has set in since the mid-1980s.
Special Economic Zones

In 1979, the opening of the first special economic zone (SEZ) in Shenzhen was—above all else—an explicit signal of the commitment to economic opening. Even today, despite the diminished importance of SEZs in the overall investment milieu, most investment still takes place within these zones, and the rules of business are subtly different. The rapid development of SEZs in the PRC is remarkable for the fact that unlike other East and Southeast Asian SEZs, which were started in basically market economies (albeit protected from world markets and competition by import substitution policies), the PRC SEZs were established in a planned, bureaucratic economic system. As a result, differences in conditions within and outside SEZs were bound to be larger in the PRC.

SEZs enhanced the credibility of the reform process by demonstrating that the PRC would maintain an open economic environment in specific, easily monitored locations. The 1980s saw a proliferation of SEZs following the declared success of the Shenzhen SEZ by Deng Xiaoping in 1982 and 1984. SEZs offered investors a vastly different operating environment whose benefits included

- lower tax rates, including complete tax holidays, for periods ranging from 3 to 10 years;
- fewer and simplified administrative and customs procedures;
- duty-free imports of components and supplies;
- ownership rights, for example, wholly owned firms were permitted in SEZs long before they were allowed elsewhere;
- unusually high levels of autonomy, which allowed firms within to innovate with new incentive structures such as flexible wage rates; and
- far superior infrastructure compared to the rest of the PRC.

From the standpoint of the manufacturing sector, a particularly important development was the formation of industrial clusters within the SEZs by firms in closely related industries. This resulted in the establishment of extensive networks of supply chains, which significantly reduced transaction and transport costs, both at the user and supplier end. The scaling up process accelerated, and the ensuing benefits in lower costs of production resulted in the enhanced export competitiveness of PRC exports.

From a historical perspective, the contribution of SEZs to the PRC economy, especially in export-related manufacturing, has been substantial. FFEs were concentrated in SEZs, both because they offered the best facilities then available in the PRC and also because of official policy that sought to isolate foreign firms from the rest of the economy. Private domestic enterprises were, until recently, largely absent from SEZs because there were few domestic private enterprises in the PRC. However, as the PRC has relaxed its investment policies, FFEs have invested outside of SEZs, while export-oriented PRC firms, especially in joint ventures, have set up operations in SEZs, making the composition of SEZs more diverse.

---

33 For a detailed discussion of the sequence of SEZ development in the PRC, see Chen, Chang, and Zhang (1995) and Tuan and Ng (2004).
The People's Republic of China's Manufacturing Sector since 1978: Implications for India

The contribution of SEZs to the PRC economy notwithstanding, there are increasing concerns about the opportunity costs to the economy as a whole by way of foregone taxes and feeble forward and backward links to the rest of the economy, which have exacerbated regional differences. An evaluation of the benefits of SEZs to the overall PRC development would have to be more comprehensive and beyond the scope of this paper.

Agglomeration Effects

The PRC's low costs are reflected in the entire supply chain, from component sourcing to manufacturing, logistics, warehousing, storage, and commercial transactions created through clusters.

There are now well over 1,000 supply clusters for export products, covering almost every major product category. The majority of supply clusters are located in the most developed PRC regions, which include the eastern provinces of Fujian, Guangdong, Jiangsu, and Zhejiang, and large metropolitan areas such as Beijing, Shanghai, and Tianjin. Nearly every city or township in these eastern provinces has one or more specialized production clusters. Eighty-five out of the 88 county-level cities in the eastern region have developed industrial clusters of some kind with over 800 clusters of various sizes dispersed over the provinces, containing 237,000 enterprises employing over 600,000 workers. For instance, Nanhai District of the city of Foshan in Guangdong Province comprises 18 towns. Each of these towns specializes in a manufacturing area such as ferrous metal processing, construction ceramics, textiles, electric appliances, household hardware, underwear, or toys. The township of Dali in Nanhai District accounts for 40% of the national output of aluminum products in volume.

The output of industrial clusters in the PRC contributes significantly to production, not just nationally but even globally. For example, labels and badges produced in Wenzhou account for 45% of the PRC's total output, lighters produced in Wenzhou make up 70% of the world market, neckties in Shengzhou account for 80% of the PRC's production and 30% of the world's total, and personal computer cases produced in Qingxi account for 30% of the world's total.

There are two types of clusters in the PRC. The first is the hub-and-spoke, where a giant manufacturer (mostly large SOEs or their joint ventures) is surrounded by a large number of suppliers and supporting firms in the local region. Generally, the hub company used to be state-owned, highly regulated, and limited to certain capital-intensive industries such as telecommunications, energy, utility, steel, and chemicals. The share of SOEs in the overall economy has decreased significantly over the years. Except for very few large enterprises, most of the enterprises in the industrial clusters are privately owned SMEs. For instance, as the birthplace of industrial clusters in Zhejiang, Wenzhou has very few SOEs: over 97% of enterprises are privately owned. However, many enterprises founded in Zhon Guan Cun cluster in Beijing in the 1980s were sponsored and funded by the Chinese Academy of Sciences, Peking University, and Tsinghua University, as a result of which this cluster has a much higher proportion of SOEs.

The second type of cluster is formed by a large number of SMEs. These non-SOEs do not receive support such as loans and real estate from the government and have to depend on their own means for economic survival. These clusters of privately owned companies have thrived and now form the backbone of the PRC market economy, having become the driving force of the national economy. These privately owned firms today produce well over one-half of the national GDP and contribute an overwhelming
share of PRC exports. In addition, these private companies advance the productivity and profitability of the whole economy and contribute substantially to new job creation in the PRC (Wu et al. 2006).

An entirely different type of industrial cluster—the high-technology industrial cluster—also emerged in the early 1980s. These clusters were formed by a group of scientists and scholars from universities and colleges, located in the surrounding areas of universities and research institutions. Zhon Guan Cun cluster in Beijing has been viewed as a role model for such clusters. It benefits greatly from being situated in a research environment where a number of high-level research institutions are located, which mainly belong to the Chinese Academy of Sciences. Thanks to its closeness to the central government and support from funding agencies, the Zhon Guan Cun cluster has become the largest high-technology research and development centers in the PRC and the largest distribution center for information technology products in northern PRC.

It is generally believed that industries with a high number of process innovations and with a high rate of local cooperation with suppliers, customers, and other related industries are more likely to show clustering dynamics. In the PRC, clusters are mostly found in the light manufacturing industries, including textiles and apparel, footwear, plastics, electronics, and automobile parts.

Many industrial clusters in the PRC demonstrate a high degree of division of labor or specialization in various production stages. Taking the label and badge industrial cluster in Jinxiang as an example, the production of a small badge involves more than a dozen stages including designing, aluminum melting, engraving, drilling, plating, pin making, assembling, and packing. Each process is done by independent and specialized enterprises, and every semi-finished product is traded through the commodity exchange market in the cluster. More than 800 enterprises are integrated to form a complete production line in the cluster.

Cluster characteristics vary by region. For example, production clusters in Jiangsu Province are mainly owned by foreign firms from Taipei, China. However, in neighboring Zhejiang Province, hundreds of production clusters have been formed by domestic private companies. Clusters in the PRC utilize a number of different marketing channels. For example, firms formed with foreign investments generally use direct marketing to large customers in foreign countries. On the other side of the continuum, many of the small and medium-sized enterprise (SME) production clusters usually serve large and small buyers through brick-and-mortar marketplaces.

Role of the government in cluster development. Governments do play an important role in facilitating cluster development. The provisional rules issued by the State Council in 1988 concerning new technological industrial development experiment zones of Beijing Municipality has encouraged enterprises to set up business in the Zhon Guan Cun cluster. In the early 1990s, the government established science and technology industrial parks extensively throughout the country, with an aim to speed up the development of high-technology industries. The industry park movement, specifically aimed at attracting information technology companies, did so with great success. Now, about 50%–80% of information technology products are produced by enterprises in these parks.

Meanwhile, some local governments have formulated preferential policies concerning land use, taxation, administration services, and charges to create a sound and
flexible external environment to attract foreign investments. These local governments have also introduced initiatives and supportive measures to boost the competitiveness of the commercial distribution sector.

In general, both the central and local governments have played an important supporting and facilitating role in cluster development. Toward this goal, the major responsibilities of the governments are to

(i) formulate measures and policies to attract investment;
(ii) ease regulations and open up more creative financing and taxing mechanisms;
(iii) regulate the market order constantly to form a fair competition environment;
(iv) improve the local environment and provide sufficient infrastructure to support technology innovation, including social institutions, university laboratories, research centers, industry associations, chambers of commerce, transport networks, public facilities, and communication networks;
(v) facilitate the opening of commodity exchange markets and expand market scale;
(vi) organize commodity exhibitions and trade fairs to promote local products and foster regional brands;
(vii) provide necessary guidance to assist industry upgrading and technology transformation projects;
(viii) coordinate integration between production and research to strengthen the technical innovation capability of industrial clusters;
(ix) strengthen personnel training and knowledge building;
(x) cultivate an ideology that nurtures cluster development, i.e., a positive attitude toward entrepreneurship, cooperation, and the governance structure in a region; and
(xi) cultivate a kind of local industry culture that can help various industry players, including enterprises, universities, and local governments, to communicate and cooperate.

FDI has favored the spatial clusters of firms engaged in related activities, because mutual benefit occurs from shared access to localized support facilities, shared service centers, customized demand patterns, and specialized factor inputs. Above all, clusters mitigate risk faced by FFEs in unfamiliar locations (Head and Ries 1996). The comprehensive policy of encouraging FDI and cluster formation has worked superbly for PRC manufacturing.

**Lessons for India**

With common characteristics such as size and population—approximate level of industrial development notwithstanding—the PRC and India do have their own unique histories and institutional arrangements. Successful experiences or policies in one country may not be easily transplanted to the other, either because they are unnecessary or do not apply to prevailing conditions. The PRC manufacturing sector currently dwarfs its counterpart in India in every respect (An Overview of the Manufacturing Sector in the People’s Republic of China, p. 121). Manufacturing contributes over
one-third to the PRC GDP compared with 16% in India. When the relative sizes of the economy are factored in—the PRC economy is about two and a half times larger as that of India—the difference in value of output is staggering. Similarly, manufacturing exports from the PRC in 2005 were almost $500 billion, compared with $40 billion from India.

However, it needs to be remembered that the gap was narrower in 1980, around the time when reforms were first initiated in the PRC. The PRC had a head start of more than a decade over India in initiating and consolidating reforms. The manufacturing sector in India has responded positively to the opportunities offered by reforms and, barring a slight downturn at the turn of the century, has displayed steady growth in output and exports. In this section, we take a more nuanced look at the strengths and weaknesses of the respective manufacturing sectors of the two countries to identify specific areas where India can learn from the PRC experience.

Government Policies

The high share of manufacturing in the PRC GDP is due to a combination of government policies that promote industrial growth and a high investment rate (both public and private), which keeps demand for materials and machinery high. India’s savings and investment rates, while still lagging considerably behind corresponding figures for the PRC, have increased steadily over the years—the savings and investment rates are both around 35% of GDP, as compared to 23% of GDP at the turn of the century. However, as a recent study points out, India leads the PRC in how efficiently it uses investment. The incremental capital output ratio for India in 2006 was 3.7 as compared with 4.4 for the PRC (Deloitte Research 2006).

For India, public investment—especially in agriculture—needs to increase sharply. The slowdown in industrial growth in India, beginning in the mid-1990s until 2002-2003, was due to the combined effect of a slowdown in agricultural growth in the 1990s and contraction in public infrastructure investment. It is heartening to note that the Government of India has explicitly acknowledged this as a policy priority and is stepping up public investment, especially in rural infrastructure.

The PRC’s success as an exporter of manufactured goods was also helped by an exchange rate that, according to experts, is artificially undervalued. In contrast, India had a significantly overvalued exchange rate that simultaneously made exports uncompetitive and imports competitive. Policies rationalizing the exchange rate were put in place following reforms in the early 1990s, thereby reducing this inherent disadvantage faced by manufacturers in India.

Reforms Directed at Small and Medium-Sized Enterprises

SMEs contribute significantly to both output and employment in India’s manufacturing sector. Unlike in the PRC, where government policies explicitly encouraged firms to scale up, in India, SMEs have the incentive to remain small. First, certain industrial sectors are reserved SMEs; hence, firms would be disqualified from receiving preferential treatment if they grew above a certain size (measured as capital investment in plant and machinery). Second, the regulatory framework, especially with respect to labor laws, is biased against larger firms. SMEs struggle to gain access to credit and often must borrow in informal markets at a premium much above official interest
rates. As a result, several firms have remained seriously undercapitalized and unable to obtain the scale that the PRC firms have.

It is especially important to promote the development of SMEs if India is to emulate the PRC in generating employment through mass manufacturing. India’s organized and large-scale manufacturing sector is highly capital-intensive and generates few employment opportunities. Despite indiscriminate policies periodically adopted by local governments to promote TVEs, the contribution that they made to jumpstart the industrial transformation of the PRC is undeniable (see also p. 130). This was made possible by access to credit due to local government support, a facility that the small-scale sector in India has found difficult to access. A review of the currently restrictive implementation of the credit policy toward SMEs needs to be undertaken by the Reserve Bank of India to promote growth of SMEs.

**Reform of Labor Laws**

Labor reforms reduced rigidities in the PRC labor market, thereby allowing firms to hire without having to worry about retrenchment in the event of a downturn (Salient Features of the People’s Republic of China’s Manufacturing Revolution, p. 130). In India, the Industrial Disputes Act (1947) forbids firms with over 100 employees from laying off or dismissing workers without explicit government permission, which is rarely granted. This leads to constraints on enterprises from gaining scale as mentioned above and encourages higher capital intensity.

The government also made a modest attempt to introduce flexibility in the labor market by allowing firms to employ labor on a contract basis. The Contract Labor Regulation and Abolition Act (1970) allowed firms to hire labor this way, but still maintained considerable government control, especially over the retrenchment process. The government reserved the right to declare a certain activity outside of the act’s purview, effectively denying the firm the option of retrenching redundant labor. For example, the government could decide that labor working in a certain industry could no longer be treated as contract, which meant that the firm was permanently saddled with these workers, even in the event of a downturn. This policy uncertainty meant that employers were not given the true flexibility to make hiring decisions. As a result, additional legislation has not allayed employers’ anxieties, and they continue to be wary about new hiring.

India would do well to study the PRC experience, especially on how workers displaced from jobs could readily find alternative employment in a rapidly growing economy.

**Infrastructure**

India invests an estimated 3%–4% of its GDP on infrastructure (though this proportion has gone up recently) as opposed to 9% in the PRC. Unsurprisingly, the poor quality of infrastructure in India adversely impacts manufacturing in several ways. There is a shortage of electric power, and the unit cost of power is much higher for India’s manufacturers. Supply is also of poor quality and unreliable. Transport bottlenecks not only result in inordinate delays but prevent the emergence of supply chains, as in the PRC. A recent joint study identified the difficulty in establishing supply-chain networks as a principal reason that discouraged FDI in manufacturing (Confederation of Indian
Industry and McKinsey & Company 2005). Moreover, port handling capacity in India is only a fraction of that in Shanghai and Singapore, which acts as a deterrent to vertical FDI. The government seems determined to remedy the situation by way of legislative changes, such as the Electricity Act (2003) and investments of the order of $500 billion in infrastructure over the next 5 years.

**Administrative Inefficiencies**

Despite changes in legislation designed to reduce administrative inefficiencies and red tape, realities in India remain daunting for individual investors. The regulatory maze is very complex, and the present structure of entry and exit laws discourages new businesses from entering. The World Bank (2008) identified high start-up costs and needless delays as the reasons that have dampened investor interest in India. It takes 35 days to start a business in India, compared to 6 days in Singapore. Similarly, it takes 10.0 years to shut down a business in India as compared to 2.4 years in the PRC. While far from a panacea, the use of information technology could help alleviate these problems. Certain states, especially in southern and western India (e.g., Andhra Pradesh, Gujarat, Karnataka, and Maharashtra) have undertaken reforms and reported considerable success in reducing delays and inefficiencies.

**Foreign Direct Investment**

When PRC FDI inflow are adjusted for round tripping, and India’s respective inflows are revised upward to conform to International Monetary Fund reporting standards, the difference in FDI inflows as a proportion of GDP is not as marked as it appears otherwise. FDI inflows as a percentage of GDP are 1.9% for India and about 3.0% for the PRC.

This qualification does not diminish the fact that the PRC has fared much better in attracting FDI than India, with even the adjusted volume of inflows more than twice that of India. More importantly, the transformative impact of FDI on the PRC’s economy, especially in manufacturing, has been far more than that in India. FDI-driven growth, particularly in the manufacturing sector, did contribute to alleviating the PRC’s balance of payment problems and in creating jobs. However, the limited impact of FDI in raising the PRC technological profile is a concern. A partial explanation for this could be due to the country of origin effects, as discussed in Salient Features of People’s Republic of China’s Manufacturing Revolution, p. 130. FDI inflows to the PRC have been predominantly from Hong Kong, China and Taipei, China and typically based on mature, standardized technologies rather than frontier technologies. Consequently, they did not benefit the PRC as much as policy planners had hoped.

India’s relatively high savings and investment rates (approximately 35% of its GDP) makes it less dependent on foreign capital than other developing countries, but FDI could still contribute the qualitative edge through technology transfer, exposure to better management practices, and entry to export markets. The lessons that India could learn from the PRC pertain more to enhancing quality rather than sheer quantity of inflows.

34 “Round tripping” refers to the recycling of PRC domestic capital as FDI to avail of special concessions accorded to FDI.
If qualitative benefits of FDI inflows were to accrue to India, a comprehensive policy review would have to be undertaken, given that FDI in India has traditionally been more horizontal (i.e., market seeking) than vertical, unlike in the PRC, where vertical FDI has predominated. India would also have to work on creating an enabling environment for FDI by improving the quality of physical and human capital, reducing administrative delays, and maintaining macroeconomic stability. However, as FDI literature has consistently pointed out, the benefits of FDI—especially with respect to technology spillovers—accrue more to those countries with an already existing capability to absorb the more advanced technology that FFEs bring. Countries with high literacy rates and with domestic firms already engaged in research and development and relatively advanced manufacturing have benefited more from FDI-related technology spillovers than countries without these attributes. This explains why directed development policies worked so effectively in East and Southeast Asia.

To obtain the qualitative benefits of FDI, India would have to invest heavily in infrastructure and introduce policies to encourage firms to ramp up their manufacturing capabilities. These objectives need to be pursued independent of FDI policy. In the absence of these developments, the benefits of FDI to India will be limited, despite the best intentions.

Developing Human Capital

Despite the availability of surplus labor in agriculture, the reallocation process in India has been hampered by high illiteracy rates, especially among the rural population. This makes adaptability to industrial jobs difficult, raising the training and reorientation costs of firms.

The rapid growth of manufacturing in the PRC was certainly helped by the broad dissemination of industrial education. The PRC has a large number of technical training institutes, which—despite being of variable quality—supply the critical mass of human capital required by the manufacturing sector. The PRC does face a skills shortage at the higher level, which is impeding the growth of the high-technology segment, something that the government is moving actively to address.

India needs to increase not just the number of institutions imparting technical education, but also the quality of education. India lags behind the PRC in the general level of education as well. Initiatives like Sarva Shiksha Abhiyan, which seeks to improve both the literacy rate and the quality of education, need to be expanded and encouraged. While industrial training institutes must be improved with more relevant curricula, the manufacturing sector in India will also have to accept its share of responsibility in developing human capital. Much skill development takes place on the job, and so industry will have to allocate resources to ensure that continual skill upgrading programs are instituted.

Firm-Level Initiatives

There is no doubt that India’s manufacturing firms suffer because of the higher cost of utilities, uncertain policy regimes, labor rigidities, and infrastructural glitches. However, firms could themselves undertake certain measures to overcome these problems as PRC firms have done. PRC firms have moved up the technology and scale ladder by interacting with world-class firms through contract manufacturing.
In addition, developing strong, dependable links with suppliers has yielded compounded benefits to PRC manufacturers in the form of reduced variability in quality and delivery, higher precision, and lower costs. India’s companies could also accomplish this. Discussions with India’s manufacturing units have revealed that they are wary of such arrangements, fearing that buyers may suddenly cancel orders, rendering built-up capacity redundant. Chandra and Sastry (2002) suggested greater integration into global supply chains to minimize this risk, but further research on the specific set of strategies that India’s manufactures need to adopt to become integrated into global production networks, would be welcome.

**Conclusion**

The PRC has made spectacular strides in developing a vibrant manufacturing sector, which has served as an engine of growth for its economy since 1978. While the speed at which the sector has grown is striking, the fact that the PRC has managed to sustain it for close to 3 decades is particularly remarkable. The growth story has been successfully tied into the larger development objective of poverty reduction.

The PRC’s success has been founded upon a combination of proactive government policies that created an enabling environment for individual enterprise to flourish. Above all, its development policy has been very pragmatic and tailored toward exploiting its strengths, such as the availability of surplus labor. Ideology was also not allowed to stand in the way of development objectives, as seen in the decision to welcome foreign capital and establish SEZs despite nearly 30 years of economic isolation. As a result, its transformation is remarkable and worthy of emulation.

However, an evaluation of the PRC’s success needs to be nuanced to consider the downside of this development approach. Issues of concern include high energy consumption (though energy intensity in certain sectors of the economy is steadily decreasing), environmental damage in the form of high pollution levels and water scarcity, regional imbalances, and rising differences in incomes.

The PRC experience in expanding its manufacturing sector, in keeping with its own unique institutional arrangements, is indeed reform “with Chinese characteristics.” It has shown that despite their undoubted benefits, neither privatization of enterprise ownership, extensive deregulation, full price flexibility, nor other widely recommended institutional changes must necessarily precede a broadly gauged advance of manufacturing capabilities. India has much to learn from the PRC, especially as far as choosing the appropriate mix of policies relating to labor, capital, and technology, but the specifics would differ considering India’s own strengths and institutional conditions.
References


# Appendix

## Table A.1: Economic Indicators, People’s Republic of China

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP ($ billion)</th>
<th>Annual Growth Rate of GDP (%)</th>
<th>GDP Per Capita Income ($)</th>
<th>Current Account Balance (% of GDP)</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>214.2</td>
<td>11.7</td>
<td>224</td>
<td>NA</td>
<td>71</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>1979</td>
<td>263.2</td>
<td>7.6</td>
<td>272</td>
<td>NA</td>
<td>70</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>1980</td>
<td>306.5</td>
<td>7.8</td>
<td>312</td>
<td>0.1</td>
<td>69</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>1981</td>
<td>293.9</td>
<td>5.2</td>
<td>291</td>
<td>0.8</td>
<td>68</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>1982</td>
<td>295.4</td>
<td>9.1</td>
<td>275</td>
<td>2.0</td>
<td>68</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>1983</td>
<td>314.6</td>
<td>10.9</td>
<td>292</td>
<td>1.4</td>
<td>67</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>1984</td>
<td>317.4</td>
<td>15.2</td>
<td>296</td>
<td>0.6</td>
<td>64</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>1985</td>
<td>309.1</td>
<td>13.5</td>
<td>288</td>
<td>(3.8)</td>
<td>62</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>1986</td>
<td>304.3</td>
<td>8.8</td>
<td>275</td>
<td>(2.4)</td>
<td>61</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>1987</td>
<td>329.9</td>
<td>11.6</td>
<td>294</td>
<td>0.1</td>
<td>60</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>1988</td>
<td>413.4</td>
<td>11.3</td>
<td>361</td>
<td>(0.9)</td>
<td>59</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>1989</td>
<td>459.8</td>
<td>4.1</td>
<td>398</td>
<td>(1.0)</td>
<td>59</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>1990</td>
<td>404.5</td>
<td>3.8</td>
<td>339</td>
<td>3.1</td>
<td>53</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>1991</td>
<td>424.1</td>
<td>9.2</td>
<td>351</td>
<td>3.3</td>
<td>54</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>1992</td>
<td>499.9</td>
<td>14.2</td>
<td>412</td>
<td>1.3</td>
<td>53</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>1993</td>
<td>641.1</td>
<td>14</td>
<td>517</td>
<td>(1.9)</td>
<td>51</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>1994</td>
<td>582.7</td>
<td>13.1</td>
<td>467</td>
<td>1.4</td>
<td>50</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>1995</td>
<td>757.0</td>
<td>10.9</td>
<td>601</td>
<td>0.2</td>
<td>49</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>1996</td>
<td>892.0</td>
<td>10</td>
<td>699</td>
<td>0.8</td>
<td>48</td>
<td>21</td>
<td>13</td>
</tr>
<tr>
<td>1997</td>
<td>985.0</td>
<td>9.3</td>
<td>771</td>
<td>3.9</td>
<td>47</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>1998</td>
<td>1,045.2</td>
<td>7.8</td>
<td>817</td>
<td>3.1</td>
<td>47</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>1999</td>
<td>1,098.8</td>
<td>7.6</td>
<td>861</td>
<td>1.4</td>
<td>47</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>2000</td>
<td>1,192.8</td>
<td>8.4</td>
<td>946</td>
<td>1.7</td>
<td>46</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>2001</td>
<td>1,316.6</td>
<td>8.3</td>
<td>1,038</td>
<td>1.3</td>
<td>45</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>2002</td>
<td>1,454.0</td>
<td>9.1</td>
<td>1,131</td>
<td>2.4</td>
<td>44</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>2003</td>
<td>1,647.9</td>
<td>10</td>
<td>1,270</td>
<td>2.8</td>
<td>49</td>
<td>22</td>
<td>29</td>
</tr>
<tr>
<td>2004</td>
<td>1,936.5</td>
<td>10.1</td>
<td>1,486</td>
<td>3.6</td>
<td>47</td>
<td>23</td>
<td>31</td>
</tr>
<tr>
<td>2005</td>
<td>2,278.4</td>
<td>10.2</td>
<td>1,716</td>
<td>7.2</td>
<td>45</td>
<td>24</td>
<td>31</td>
</tr>
<tr>
<td>2006</td>
<td>2,666.8</td>
<td>10.7</td>
<td>2,013</td>
<td>9.4</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**GDP** = gross domestic product, **NA** = not applicable.

**Note:** Figures in parenthesis represent negative numbers.

<table>
<thead>
<tr>
<th>Year</th>
<th>Constant 1990 Prices ($ billion)</th>
<th>Rate of Growth</th>
<th>Share of Gross Domestic Product (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>47.0</td>
<td>16.4</td>
<td>44</td>
</tr>
<tr>
<td>1979</td>
<td>51.1</td>
<td>8.7</td>
<td>44</td>
</tr>
<tr>
<td>1980</td>
<td>57.6</td>
<td>12.6</td>
<td>44</td>
</tr>
<tr>
<td>1981</td>
<td>58.5</td>
<td>1.7</td>
<td>42</td>
</tr>
<tr>
<td>1982</td>
<td>61.9</td>
<td>5.8</td>
<td>41</td>
</tr>
<tr>
<td>1983</td>
<td>68.0</td>
<td>9.7</td>
<td>40</td>
</tr>
<tr>
<td>1984</td>
<td>78.1</td>
<td>14.9</td>
<td>39</td>
</tr>
<tr>
<td>1985</td>
<td>92.3</td>
<td>18.2</td>
<td>38</td>
</tr>
<tr>
<td>1986</td>
<td>101.2</td>
<td>9.7</td>
<td>39</td>
</tr>
<tr>
<td>1987</td>
<td>114.6</td>
<td>13.2</td>
<td>38</td>
</tr>
<tr>
<td>1988</td>
<td>132.0</td>
<td>15.3</td>
<td>38</td>
</tr>
<tr>
<td>1989</td>
<td>138.7</td>
<td>5.1</td>
<td>38</td>
</tr>
<tr>
<td>1990</td>
<td>143.4</td>
<td>3.4</td>
<td>37</td>
</tr>
<tr>
<td>1991</td>
<td>164.0</td>
<td>14.4</td>
<td>37</td>
</tr>
<tr>
<td>1992</td>
<td>198.7</td>
<td>21.2</td>
<td>38</td>
</tr>
<tr>
<td>1993</td>
<td>238.6</td>
<td>20.1</td>
<td>40</td>
</tr>
<tr>
<td>1994</td>
<td>283.8</td>
<td>18.9</td>
<td>40</td>
</tr>
<tr>
<td>1995</td>
<td>323.6</td>
<td>14.0</td>
<td>41</td>
</tr>
<tr>
<td>1996</td>
<td>364.1</td>
<td>12.5</td>
<td>41</td>
</tr>
<tr>
<td>1997</td>
<td>405.3</td>
<td>11.3</td>
<td>42</td>
</tr>
<tr>
<td>1998</td>
<td>441.4</td>
<td>8.9</td>
<td>40</td>
</tr>
<tr>
<td>1999</td>
<td>479.0</td>
<td>8.5</td>
<td>40</td>
</tr>
<tr>
<td>2000</td>
<td>525.9</td>
<td>9.8</td>
<td>40</td>
</tr>
<tr>
<td>2001</td>
<td>571.4</td>
<td>8.7</td>
<td>40</td>
</tr>
<tr>
<td>2002</td>
<td>628.4</td>
<td>10.0</td>
<td>39</td>
</tr>
<tr>
<td>2003</td>
<td>708.6</td>
<td>12.8</td>
<td>40</td>
</tr>
<tr>
<td>2004</td>
<td>790.1</td>
<td>11.5</td>
<td>41</td>
</tr>
<tr>
<td>2005</td>
<td>881.6</td>
<td>11.6</td>
<td>42</td>
</tr>
<tr>
<td>2006</td>
<td>964.0</td>
<td>9.3</td>
<td>41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>State-Owned Enterprises</th>
<th>Collective Enterprises</th>
<th>Private Enterprises</th>
<th>Foreign-Funded Enterprises</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gross Output</td>
<td>Output Value (%)</td>
<td>Gross Output</td>
<td>Output Value (%)</td>
<td>Gross Output</td>
</tr>
<tr>
<td>1978</td>
<td>423.7</td>
<td>328.9</td>
<td>77.6</td>
<td>94.8</td>
<td>22.4</td>
</tr>
<tr>
<td>1980</td>
<td>515.4</td>
<td>391.6</td>
<td>76.0</td>
<td>121.3</td>
<td>23.5</td>
</tr>
<tr>
<td>1985</td>
<td>971.6</td>
<td>630.2</td>
<td>64.9</td>
<td>311.7</td>
<td>32.1</td>
</tr>
<tr>
<td>1986</td>
<td>1,119.4</td>
<td>697.1</td>
<td>62.3</td>
<td>375.2</td>
<td>33.5</td>
</tr>
<tr>
<td>1987</td>
<td>1,381.3</td>
<td>825.0</td>
<td>59.7</td>
<td>478.2</td>
<td>34.6</td>
</tr>
<tr>
<td>1988</td>
<td>1,822.4</td>
<td>1,035.1</td>
<td>56.8</td>
<td>658.7</td>
<td>36.1</td>
</tr>
<tr>
<td>1989</td>
<td>2,201.7</td>
<td>1,234.3</td>
<td>56.1</td>
<td>785.8</td>
<td>35.7</td>
</tr>
<tr>
<td>1990</td>
<td>2,392.4</td>
<td>1,306.4</td>
<td>54.6</td>
<td>852.3</td>
<td>35.6</td>
</tr>
<tr>
<td>1991</td>
<td>2,662.5</td>
<td>1,495.5</td>
<td>56.2</td>
<td>878.3</td>
<td>33.0</td>
</tr>
<tr>
<td>1992</td>
<td>3,459.9</td>
<td>1,782.4</td>
<td>51.5</td>
<td>1,213.5</td>
<td>35.1</td>
</tr>
<tr>
<td>1993</td>
<td>4,840.2</td>
<td>2,272.5</td>
<td>47.0</td>
<td>1,646.4</td>
<td>34.0</td>
</tr>
<tr>
<td>1994</td>
<td>7,017.6</td>
<td>2,620.1</td>
<td>37.3</td>
<td>2,647.2</td>
<td>37.7</td>
</tr>
<tr>
<td>1995</td>
<td>9,189.4</td>
<td>3,122.0</td>
<td>34.0</td>
<td>3,362.3</td>
<td>36.6</td>
</tr>
<tr>
<td>1996</td>
<td>9,959.5</td>
<td>3,617.3</td>
<td>36.3</td>
<td>3,923.2</td>
<td>39.4</td>
</tr>
<tr>
<td>1997</td>
<td>11,373.3</td>
<td>3,596.8</td>
<td>31.6</td>
<td>4,334.7</td>
<td>38.1</td>
</tr>
<tr>
<td>1998</td>
<td>11,904.8</td>
<td>3,362.1</td>
<td>28.2</td>
<td>4,573.0</td>
<td>38.4</td>
</tr>
<tr>
<td>1999</td>
<td>7,270.7</td>
<td>2,221.6</td>
<td>30.6</td>
<td>1,241.4</td>
<td>17.1</td>
</tr>
<tr>
<td>2000</td>
<td>8,567.4</td>
<td>4,055.4</td>
<td>47.3</td>
<td>1,190.8</td>
<td>13.9</td>
</tr>
<tr>
<td>2001</td>
<td>9,544.9</td>
<td>4,240.9</td>
<td>44.4</td>
<td>1,005.3</td>
<td>10.5</td>
</tr>
<tr>
<td>2002</td>
<td>11,077.7</td>
<td>4,517.9</td>
<td>40.8</td>
<td>961.9</td>
<td>8.7</td>
</tr>
<tr>
<td>2003</td>
<td>14,227.1</td>
<td>5,340.8</td>
<td>37.5</td>
<td>945.8</td>
<td>6.7</td>
</tr>
<tr>
<td>2004</td>
<td>18,722.1</td>
<td>6,597.1</td>
<td>35.2</td>
<td>1,058.6</td>
<td>5.7</td>
</tr>
</tbody>
</table>

NA = not applicable.

Note: Due to adjustment in coverage and classification, data from 1999 are not comparable to the previous period.

### Table A.4: Share of Manufactured Goods in Total Expenses

<table>
<thead>
<tr>
<th>Year</th>
<th>Total ($ billion)</th>
<th>Manufactured Goods ($ billion)</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>18.1</td>
<td>9.0</td>
<td>49.7</td>
</tr>
<tr>
<td>1985</td>
<td>27.4</td>
<td>13.5</td>
<td>49.4</td>
</tr>
<tr>
<td>1989</td>
<td>52.5</td>
<td>37.5</td>
<td>71.3</td>
</tr>
<tr>
<td>1990</td>
<td>62.1</td>
<td>46.2</td>
<td>74.4</td>
</tr>
<tr>
<td>1991</td>
<td>71.9</td>
<td>55.7</td>
<td>77.5</td>
</tr>
<tr>
<td>1992</td>
<td>84.9</td>
<td>67.9</td>
<td>80.0</td>
</tr>
<tr>
<td>1993</td>
<td>91.7</td>
<td>75.1</td>
<td>81.8</td>
</tr>
<tr>
<td>1994</td>
<td>121.0</td>
<td>101.3</td>
<td>83.7</td>
</tr>
<tr>
<td>1995</td>
<td>148.8</td>
<td>127.3</td>
<td>85.6</td>
</tr>
<tr>
<td>1996</td>
<td>151.1</td>
<td>129.1</td>
<td>85.5</td>
</tr>
<tr>
<td>1997</td>
<td>182.8</td>
<td>158.8</td>
<td>86.9</td>
</tr>
<tr>
<td>1998</td>
<td>183.7</td>
<td>163.2</td>
<td>88.9</td>
</tr>
<tr>
<td>1999</td>
<td>194.9</td>
<td>175.0</td>
<td>89.8</td>
</tr>
<tr>
<td>2000</td>
<td>249.2</td>
<td>223.7</td>
<td>89.8</td>
</tr>
<tr>
<td>2001</td>
<td>266.1</td>
<td>239.8</td>
<td>90.1</td>
</tr>
<tr>
<td>2002</td>
<td>325.6</td>
<td>297.1</td>
<td>91.2</td>
</tr>
<tr>
<td>2003</td>
<td>438.2</td>
<td>403.4</td>
<td>92.1</td>
</tr>
<tr>
<td>2004</td>
<td>593.3</td>
<td>552.8</td>
<td>93.2</td>
</tr>
<tr>
<td>2005</td>
<td>762.0</td>
<td>712.9</td>
<td>93.6</td>
</tr>
</tbody>
</table>


### Table A.5: Employment in the People’s Republic of China’s Manufacturing Sector

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (millions of persons employed)</th>
<th>Manufacturing</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>401.5</td>
<td>53.3</td>
<td>13.3</td>
</tr>
<tr>
<td>1980</td>
<td>423.6</td>
<td>59.0</td>
<td>13.9</td>
</tr>
<tr>
<td>1985</td>
<td>498.7</td>
<td>74.1</td>
<td>14.9</td>
</tr>
<tr>
<td>1989</td>
<td>553.3</td>
<td>85.5</td>
<td>15.5</td>
</tr>
<tr>
<td>1990</td>
<td>647.5</td>
<td>86.2</td>
<td>13.3</td>
</tr>
<tr>
<td>1991</td>
<td>654.9</td>
<td>88.4</td>
<td>13.5</td>
</tr>
<tr>
<td>1992</td>
<td>661.5</td>
<td>91.1</td>
<td>13.8</td>
</tr>
<tr>
<td>1993</td>
<td>668.1</td>
<td>93.0</td>
<td>13.9</td>
</tr>
<tr>
<td>1994</td>
<td>674.6</td>
<td>96.1</td>
<td>14.3</td>
</tr>
<tr>
<td>1995</td>
<td>680.7</td>
<td>98.0</td>
<td>14.4</td>
</tr>
<tr>
<td>1996</td>
<td>689.5</td>
<td>97.6</td>
<td>14.2</td>
</tr>
<tr>
<td>1997</td>
<td>698.2</td>
<td>96.1</td>
<td>13.8</td>
</tr>
<tr>
<td>1998</td>
<td>706.4</td>
<td>83.2</td>
<td>11.8</td>
</tr>
<tr>
<td>1999</td>
<td>713.9</td>
<td>81.1</td>
<td>11.4</td>
</tr>
<tr>
<td>2000</td>
<td>720.9</td>
<td>80.4</td>
<td>11.2</td>
</tr>
<tr>
<td>2001</td>
<td>730.3</td>
<td>80.8</td>
<td>11.1</td>
</tr>
<tr>
<td>2002</td>
<td>737.4</td>
<td>83.1</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Table A.6: Foreign-Funded Enterprise Contribution to Industrial Output, People’s Republic of China (RMB billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>National Industrial Output</th>
<th>Industrial Output by Foreign-Funded Enterprises</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>1,970.1</td>
<td>44.9</td>
<td>2.3</td>
</tr>
<tr>
<td>1991</td>
<td>2,313.6</td>
<td>122.3</td>
<td>5.3</td>
</tr>
<tr>
<td>1992</td>
<td>2,914.9</td>
<td>206.6</td>
<td>7.1</td>
</tr>
<tr>
<td>1993</td>
<td>4,051.4</td>
<td>370.4</td>
<td>9.2</td>
</tr>
<tr>
<td>1994</td>
<td>7,686.7</td>
<td>864.9</td>
<td>11.3</td>
</tr>
<tr>
<td>1995</td>
<td>9,196.3</td>
<td>1,315.4</td>
<td>14.3</td>
</tr>
<tr>
<td>1996</td>
<td>9,959.6</td>
<td>1,507.8</td>
<td>15.1</td>
</tr>
<tr>
<td>1997</td>
<td>5,615.0</td>
<td>1,042.7</td>
<td>18.6</td>
</tr>
<tr>
<td>1998</td>
<td>5,819.5</td>
<td>1,416.2</td>
<td>24.0</td>
</tr>
<tr>
<td>1999</td>
<td>6,377.5</td>
<td>1,769.6</td>
<td>27.8</td>
</tr>
<tr>
<td>2000</td>
<td>7,396.5</td>
<td>2,314.6</td>
<td>22.5</td>
</tr>
<tr>
<td>2001</td>
<td>9,475.2</td>
<td>2,651.6</td>
<td>28.1</td>
</tr>
<tr>
<td>2002</td>
<td>10,119.9</td>
<td>3,377.1</td>
<td>33.4</td>
</tr>
<tr>
<td>2003</td>
<td>12,830.6</td>
<td>4,601.9</td>
<td>35.9</td>
</tr>
<tr>
<td>2004</td>
<td>18,722.1</td>
<td>5,884.7</td>
<td>31.4</td>
</tr>
<tr>
<td>2005</td>
<td>24,962.5</td>
<td>7,839.9</td>
<td>31.4</td>
</tr>
<tr>
<td>2006</td>
<td>31,563.0</td>
<td>9,942.1</td>
<td>31.5</td>
</tr>
</tbody>
</table>

Source: Invest in China. www.fdi.gov.cn
<table>
<thead>
<tr>
<th>Provinces and Regions</th>
<th>Number of Enterprises (unit)</th>
<th>Total Investment ($ billion)</th>
<th>Registered Capital ($ billion)</th>
<th>Foreign Investment ($ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Total</td>
<td>242,284</td>
<td>260,000</td>
<td>1,311.2</td>
<td>1,464.0</td>
</tr>
<tr>
<td>Beijing</td>
<td>9,890</td>
<td>10,980</td>
<td>53.2</td>
<td>60.7</td>
</tr>
<tr>
<td>Tianjin</td>
<td>9,938</td>
<td>10,933</td>
<td>47.0</td>
<td>56.8</td>
</tr>
<tr>
<td>Hebei</td>
<td>3,497</td>
<td>3,637</td>
<td>20.1</td>
<td>21.9</td>
</tr>
<tr>
<td>Shanxi</td>
<td>705</td>
<td>776</td>
<td>6.9</td>
<td>7.7</td>
</tr>
<tr>
<td>Inner Mongolia</td>
<td>847</td>
<td>914</td>
<td>10.8</td>
<td>12.6</td>
</tr>
<tr>
<td>Liaoning</td>
<td>14,858</td>
<td>16,542</td>
<td>67.9</td>
<td>81.5</td>
</tr>
<tr>
<td>Jilin</td>
<td>2,370</td>
<td>2,488</td>
<td>19.4</td>
<td>20.7</td>
</tr>
<tr>
<td>Heilongjiang</td>
<td>2,202</td>
<td>2,288</td>
<td>9.5</td>
<td>11.0</td>
</tr>
<tr>
<td>Shanghai</td>
<td>26,657</td>
<td>28,978</td>
<td>172.2</td>
<td>200.7</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>29,939</td>
<td>33,321</td>
<td>217.0</td>
<td>265.7</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>17,792</td>
<td>19,009</td>
<td>83.4</td>
<td>101.9</td>
</tr>
<tr>
<td>Anhui</td>
<td>2,114</td>
<td>2,165</td>
<td>12.9</td>
<td>15.5</td>
</tr>
<tr>
<td>Fujian</td>
<td>17,236</td>
<td>17,854</td>
<td>68.9</td>
<td>75.3</td>
</tr>
<tr>
<td>Jiangxi</td>
<td>3,415</td>
<td>3,980</td>
<td>16.3</td>
<td>18.5</td>
</tr>
<tr>
<td>Shandong</td>
<td>19,251</td>
<td>20,153</td>
<td>69.4</td>
<td>78.6</td>
</tr>
<tr>
<td>Henan</td>
<td>2,600</td>
<td>2,877</td>
<td>14.9</td>
<td>20.6</td>
</tr>
<tr>
<td>Hubei</td>
<td>4,173</td>
<td>4,284</td>
<td>22.7</td>
<td>25.8</td>
</tr>
<tr>
<td>Hunan</td>
<td>2,598</td>
<td>2,712</td>
<td>11.9</td>
<td>15.8</td>
</tr>
<tr>
<td>Guangdong</td>
<td>55,259</td>
<td>58,762</td>
<td>261.0</td>
<td>288.9</td>
</tr>
<tr>
<td>Guangxi</td>
<td>2,336</td>
<td>2,441</td>
<td>12.7</td>
<td>14.7</td>
</tr>
<tr>
<td>Hainan</td>
<td>2,329</td>
<td>2,456</td>
<td>8.6</td>
<td>9.2</td>
</tr>
<tr>
<td>Chongqing</td>
<td>1,294</td>
<td>1,315</td>
<td>7.2</td>
<td>8.0</td>
</tr>
<tr>
<td>Sichuan</td>
<td>3,789</td>
<td>4,075</td>
<td>14.0</td>
<td>16.6</td>
</tr>
<tr>
<td>Guizhou</td>
<td>641</td>
<td>649</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Yunnan</td>
<td>1,761</td>
<td>1,817</td>
<td>7.9</td>
<td>8.4</td>
</tr>
<tr>
<td>Tibet</td>
<td>86</td>
<td>100</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Shaanxi</td>
<td>2,754</td>
<td>2,890</td>
<td>12.5</td>
<td>13.7</td>
</tr>
<tr>
<td>Gansu</td>
<td>650</td>
<td>658</td>
<td>3.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Qinghai</td>
<td>161</td>
<td>138</td>
<td>1.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Ningxia</td>
<td>454</td>
<td>463</td>
<td>4.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Xinjiang Uygur</td>
<td>331</td>
<td>345</td>
<td>1.4</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Table A.8: Checklist of Landmark Legislation of Foreign Direct Investment Policy in the People’s Republic of China

**Stage I (1979–1986)**
- Equity Joint Venture Law (1979)
- Constitutional law revision for foreign direct investment (1982)
- Wholly Owned Subsidiaries Law (1986)
- Provisions for Foreign Direct Investment Encouragement (1986)

**Stage II (1987–1991)**
- Interim Provisions on guiding foreign direct investment (1987)
- Delegation on approval of selected foreign direct investment projects to more local governments (1988)
- Rules for the implementation of Wholly Owned Subsidiaries Law (1990)

**Stage III (1992–2001)**
- Trade Union Law (1992)
- Company Law (1993)
- Provisional regulations of value-added tax, consumption tax, business tax, and enterprise income tax (1993)
- Law on Certified Public Accountants (1994)
- Further delegation for approving foreign direct investment to local governments (1996)
- Customs administration reform (1998)
- Regulation on Trial Operation of Foreign Banks in Shenzhen and Putong (1998)
- Law of Land Management (1999)
- Contract Law (1999)
- Regulation Governing Foreign Direct Investment to Domestic Commerce Sector (1999)
- Establishment of national finance and insurance commissions (1999)
- Accession to the World Trade Organization (2001)
- Closer Economic Partnership Arrangement with Hong Kong, China and Macau, China (2003)
State-Owned Enterprise Reforms in the People’s Republic of China

Poonam Gupta and Amitendu Palit

The success of the reform processes in the People’s Republic of China (PRC) over the past 3 decades—which has transformed a predominantly state-owned economy with a per capita income of $183 (at 2002 prices) in 1979 into one with $1,268 in 2004—has truly been phenomenal. Hence, there is a consensus among observers and reform practitioners that the mainly “homegrown” PRC reform process can impart useful lessons for other developing countries.

Overview of Reforms

An important component of the reforms in the PRC has been the reform of its state-owned enterprises (SOEs). While reforms in other sectors started in 1978, concerted reforms in SOEs did not begin until the mid-1980s and were carried out in two main phases. During the first phase—which lasted for about a decade up to the mid-1990s—reforms were limited to changing management incentives within state ownership. The second phase—which began in the mid-1990s—focused on shifting the ownership of enterprises from the state to the domestic private sector and to foreign investors. These efforts have yielded benefits far greater than the reforms during the first phase, when the focus was on greater autonomy and management incentives. Economic gains from the SOE reforms have been impressive and have extended to improvements in efficiency and productivity, higher research and development investment and expenditure, higher growth, and spectacular export performance for the industrial enterprises.

While SOE reforms have been going on for more than 2 decades in the PRC, the bulk of changes seem to have occurred only from 1995 to the early 2000s. In this sense, the transfer of ownership of SOEs has been quite rapid. Unsurprisingly, there have been some adverse impacts on employment, but government policies cushioned its effects on labor.

---

1 Poonam Gupta is a professor at the Indian Council for Research on International Economic Relations, New Delhi; and Amitendu Palit is head of the Development and Programs and a visiting senior research fellow at the Institute of South Asian Studies, National University of Singapore, Singapore. This study draws on various sources including the academic research as cited, policy writings, and discussions with officials from the People’s Republic of China. In particular, it draws heavily from Garnaut et al. (2005) and Yusuf et al. (2006).
This chapter analyzes the various aspects of SOE reforms in the PRC. In particular, it looks at the (i) extent, pace, and sequencing of reforms; (ii) factors that determined various aspects of the reform program; (iii) institutional handling of the reforms and modes adopted for privatization and termination of government monopoly control; (iv) roles played by different stakeholders, including those by various levels of government, employees, and managers; (v) handling of the massive restructuring of labor through social safety nets, unemployment benefits, and reemployment training provided to laid-off workers; (vi) gains from SOE reforms; and (vii) challenges faced during the reform processes.

The salient features of the SOE reform process in the PRC can be summarized as follows:

SOE reforms were part of comprehensive product market reforms. An interesting and useful sequencing of activities seems to have been calibrated in the overall reform process in the PRC, where larger product market reforms—including special economic zones, foreign direct investment, and trade reforms—were carried out first, and ownership reforms in SOEs were carried out subsequently. Thus, SOE reforms were part of the more comprehensive product market reforms, which probably weakened any potential resistance and made the outcome much more favorable.

Modalities and pace of reforms were tailored to meet desired objectives and to suit prevailing conditions. Different modes of SOE reforms were used, ranging from providing greater autonomy to managers, sale of ownership to employees and managers, to outright privatization through transfer of ownership to domestic and foreign investors. Providing greater autonomy and incentives to managers yielded limited gains and were short-lived. Eventually, as SOEs faced increased competition from wider product market liberalization, the need for ownership transformation became necessary. These reforms were carried out in a decentralized manner in which local and provincial governments and local bureaucratic machinery played major roles.

As with other reforms, SOE reforms were introduced gradually and incrementally. They were often first experimented in certain regions and then replicated on a larger scale. The ownership transformation was carried out in the early 1990s, a decade and a half after the reforms began. The pace of SOE reforms seemed to be gradual until the early 1990s, when ownership reforms were first started, but subsequent ownership transformations were achieved quite rapidly.

Local sensitivities were kept in mind, and local government and bureaucracy were entrusted with the major aspects of reforms. To transfer ownership of SOEs, several sensitivities were kept in mind. For example, instead of using “privatization,” the term gaizhi (restructuring) was used. Before major restructuring was carried out, ownership of SOEs was transferred to provincial and local governments. This was apparently done with three objectives:

(i) Any resistance to ownership reforms would be spread out across these levels of government rather than being directed to the central government alone.

---

2 Since SOE reforms in the PRC have been mostly concentrated in the secondary sector, the focus of this study is on the reforms of SOEs in manufacturing. However, some of the lessons that are gleaned are more generic—including the institutional handling of reforms and issues related to labor.
(ii) By making budget constraints felt at the provincial and local government levels, consensus would be easier to obtain.

(iii) Since local officials were closer to the ground, it was perhaps easier for them to tailor the reform process to suit local conditions.

**Various forms of reforms were used during the restructuring, with open sales and leasing becoming more popular over time than employee shareholdings and management buyouts.** In the initial years of reform, employee shareholding was the preferred mode of restructuring, which led to more management buyouts. Several enterprises were also allowed to spin off or to restructure through bankruptcy, but these arrangements were supposedly abused. Hence, in more recent years, open sales and leasing have been the preferred modes of restructuring. Modes of reform among regions also varied. In terms of the sequencing of privatization, within firms, smaller firms were allowed to be privatized before medium-sized and larger ones.

**Labor market implications were carefully examined and addressed, which succeeded in cushioning the effect on labor.** Crucial reforms related to labor began years before privatization and large-scale layoffs took place. In the first phase of reforms, enterprises were gradually granted increased flexibility in hiring labor; subsequently, the use of contractual labor was allowed. SOEs identified surplus labor, and reforms in social security were started, such as pension, health benefit, and unemployment insurance reforms.

Perhaps the most important and politically sensitive part of the reforms was the labor layoffs during the second phase due to ownership transformation. The extent of the layoffs was unprecedented—more than 40 million workers were laid off from SOEs from the mid-1990s to the early 2000s. It seems that while laid-off workers or the public received little communication during this process, the government did try to treat this issue with sensitivity and addressed several aspects to ease the impact of layoffs. Just like the use of the term gaizhi, the term xiagang was used for those who were laid off instead of “unemployed.” The term literally means “losing the position” and referred to workers laid off from SOEs but who remained registered with reemployment centers and maintained some ties with SOEs. Moreover, the employees’ conference had to approve the restructuring, and several measures were used to ease the transition for workers. For example, (i) workers maintained their relations with the old enterprises, as they often went there for retraining; (ii) generous layoff packages were provided (including a premium for losing their status as state employees); (iii) an attempt was made to keep at least one member of the family employed; (iv) workers were allowed to keep their medical and social security benefits; (v) preference was often given to employees to own shares of the transformed enterprises, in addition to providing credit if they did not have money to finance the share purchase; (vi) receipts from land use were often used to pay arrears to the employees, and settling of these arrears was usually given priority over other settlements; and (vii) negotiations were conducted and incentives provided to the new owners of the enterprises to retain as many workers as possible.

Despite being an overwhelming success, the reform process faced a few challenges, and some reforms remain unfinished. These relate to (i) social security reforms, (ii) corporate governance in the remaining SOEs, (iii) the development of modern corporate governance practices and institutions that support it, and (iv) dividend payments by SOEs.
Timing and Sequencing of State-Owned Enterprise Reforms

The key to improving the performance of SOEs is to align the interests and incentives of management with those of the owners. This can be achieved by (i) providing incentives to the managers in a manner that minimizes agency costs, and (ii) assigning well-defined property rights and moving the ownership to the non-state sector. In addition to these two schools of thought, it is also believed that product market competition can exert important pressures to reform SOEs. The PRC experimented with both systems—management incentives and privatization—and along with these, increasingly subjected the product markets to competition.

While overall reforms in the PRC started in 1978, concerted reforms in SOEs did not begin until the mid-1980s and were carried out in two main phases. In the first phase, which lasted until the mid-1990s, it focused on enhancing the performance of SOEs through greater autonomy and on linking the salaries and bonuses of management to various performance indicators that were enforced through performance contracts. In some cases, the enterprises were leased as well, often on the basis of managers paying a fixed proportion of the profit to the state. In the second phase, ownership reforms were carried out.

On the eve of the reforms, it seemed that no blueprint of the policies to improve the efficiency of the state sector existed. The issue was subject to continuous deliberation and discussion, based on policies that evolved continuously. There are various reasons why a country might decide to restructure or privatize SOEs, including (i) improving efficiency by reducing agency costs or by better defining property rights to create fiscal space if SOEs are losing money, and (ii) reducing the burden on state-owned banks and fostering competition and improving productivity by allowing the market to play a larger role in economic decision making. Similar factors influenced the decisions in the PRC at various stages of its reform process, though different factors weighed in at different points in time. The ultimate objectives of the reform process were to increase efficiency and to reduce the fiscal burden on account of loss-making enterprises.

Thus, the impetus to SOE reforms—including the thrust toward privatization in the mid-1990s—usually came when SOEs were losing money. Stakeholder sensitivities, particularly those of labor, were always considered. Efforts were made to gauge public response to proposed reforms through surveys. For instance, in the early 1980s, a group of young reformers conducted a survey to assess the public’s reaction to a more market-determined economy. The survey also assessed sentiment toward contractual employment in enterprises, as opposed to permanent ones.

The State-Owned Enterprise Sector on the Eve of the Reforms

On the eve of the reforms in 1978, 80% of the country’s industrial output came from the state sector and the rest from collective enterprises. An estimated 30,000 large and medium-sized firms and 150,000 small firms existed in 1978. These enterprises

---

3 Collective enterprises were owned by urban or rural communities depending upon their activities. Community members did not control economic activity of these enterprises, and local authorities appointed their management.
were given output and input targets (the planning and allocation of which were done at the provincial and local levels), and some financial targets on sales or profits. The government set the prices, which were generally profitable for the enterprises. Thus, the market for products and inputs were virtually nonexistent. Since the private sector did not offer competition, the enterprises earned monopoly rents. The state banks and central banks provided finances, and the enterprises were required to keep the surplus cash with the central bank. The firms, in turn, had to surrender their profits and did not have the flexibility to make investment decisions, or to plough back the profits into the enterprise. Thus, SOEs faced a soft budget constraint, but since they were, on average, profitable, it did not matter.

The immediate need under these circumstances was not to tamper with the ownership structure of SOEs, but to increase the availability of food and other consumables to the public, provide incentives to the people, and enhance efficiency by encouraging foreign capital and foreign trade. Thus, in the early years, reforms concentrated on agriculture, special economic zones, and opening up foreign trade.

State-Owned Enterprise Reforms during 1979–1989

During 1979–1984, though greater emphasis was put on enterprise profits and enterprises were allowed to retain profits above a certain target, profit targets and the share of profits to be retained had to be negotiated. This was later combined or substituted with a formal tax on profits, which also had to be negotiated.

A by-product of the flexibility to determine prices and to procure inputs was the revival of collectively owned units in the form of town and village enterprises (TVEs) during the latter half of the 1980s (Box 1). Consequently, the share of industrial output accounted for by the collective units increased from 20% during the end of the 1970s to about one-third during the end of the 1980s.

It is also important to note that prior to the reforms, distorted incentive structures in the labor market had produced different outcomes in urban and rural areas. The “iron rice bowl” phenomenon had led to serious overcrowding of SOEs in urban areas, while its marginal application, along with controls on migration imposed through the household registration system (hukou), rendered a large rural labor force surplus and many rural workers nonparticipative in industrialization (Debroy 2008). Reforms relaxing hukou and enabling rural workers to take up jobs in towns and cities, helped TVEs to grow.4 These reforms must be seen as an important precursor to SOE reforms as they succeeded in making the labor supply more elastic and responsive to market-based incentives.

In 1984, SOEs were given far greater autonomy to choose their production levels, set prices, hire workers, and make investment decisions. These reforms were carried out with the slogan “Zhengqi Fenkai,” which means separating the party and management. The enterprises were allowed to sell products produced above the quota level, for which they could charge 20% more than the prices set by the state. Thus, a dual price system was allowed. They were also allowed to use their depreciation funds and to sell idle assets to finance investment. They were likewise given greater flexibility in setting wages, which could affect profits, and in choosing their middle-level managers. A crucial practice used at this time was to allow hiring of workers on a contractual

---

4 The Notice on Becoming Urban Residents from Rural Areas was issued by the State Council in 1984. This made it possible for domiciled rural residents to migrate to towns and cities. See Debroy 2008.
Brooks and Tao (2003) and Gang et al. (1998) confirmed that by 1990, SOEs were hiring most of their new workers on a contractual basis. Greater flexibility in terms of the input and output mix—along with pricing and employment—laid the groundwork for a market economy.

During this phase, as it was prior to the reforms, SOEs continued to remain profitable, and as such, there was no pressing need for the reforms described above (Yusuf et al. 2006). The reforms of this period were guided more by the practical administrative problems of monitoring and deciding on the inputs, outputs, and price targets for

---

Box 1: The Rise and Fall of Township and Village Enterprises

Township and village enterprises (TVEs) refer to mostly small and medium-sized industrial enterprises in rural People’s Republic of China. These existed under the names “commune” and “brigade enterprise” as far back as the 1960s, and were revived following the agricultural reforms in the late 1970s. The objectives behind the revival of TVEs were to absorb surplus labor from agriculture and to alleviate poverty. There were two kinds of TVEs: (i) private TVEs run by individuals or as partnerships and joint ventures, and (ii) collective TVEs run by local government administrative units.

These TVEs flourished in the early years of the reforms because of the availability of surplus labor (rendered surplus by increased agricultural productivity) and capital available due to a rise in income levels. Another factor that aided their growth was the flexibility to buy inputs and machines, which was liberalized in 1984. Local governments also provided support, in particular, by securing credit for TVEs from state-owned banks. Just like other state-owned enterprises, they earned monopoly rents with limited competition from the private sector.

Their rise was quite impressive and timely, with annual growth rate estimated at an average of 25% a year between the mid-1980s and mid-1990s. By 1995, TVEs accounted for almost a quarter of the country’s gross domestic product, two-thirds of the total rural output, and more than one-third of the country’s export earnings. The success of TVEs demonstrated the benefits that (even semi-) privately owned enterprises could impart to society through increased output, employment, and efficiency. TVEs were also instrumental in helping people migrate from agricultural to rural industries, rather than to urban areas.

The success of TVEs was widely recognized and contributed to the successful transition of the economy from an agricultural to an industrial one. However, the limits of these enterprises for enhancing economic prosperity soon became evident. Several problems affected their economic performance, including vaguely defined property rights, soft budget constraints, and high nonperforming loans. In the absence of strict environmental regulations, many TVEs are also believed to have adversely impacted the environment.

As government policy changed toward the management and ownership of enterprises, it affected the operations of TVEs, too. Initially, starting in the late 1980s, TVEs were leased out. In the late 1990s, the government’s privatization efforts began in the rural areas and with TVEs, which were often sold to their managers.

Source: Biggeri 2001; Field et al. 2006.
the thousands of enterprises and products, and the overall objective of improving the efficiency of the system.

Around 1986–1987, following their increased autonomy, SOEs were placed under a contract responsibility system, wherein the government had management sign performance contracts that defined their targets. The contracts were negotiated between the government and management and included revenue-sharing agreements. By the end of 1980s, almost all SOEs had adopted these performance contracts, which were applicable until 1993.6

Empirical evidence on the effect of the reforms during this period is somewhat mixed. Li (1997), who assessed the impact of the reforms on the productivity of 272 SOEs, found that SOEs improved significantly. He also found that the productivity improvements can largely be attributed to improved incentives, intensified product market competition, and improvements in factor allocation. Others, however, dispute such findings.

In another empirical study, Li and Wu (2002) used a sample of 680 SOEs and compared the relative effectiveness of management-based versus ownership-based reforms. They found strong evidence that the ownership-based reforms improved economic performance but no evidence that management-based reforms had a similar impact.

Thus, the key features of this decade were the rise of TVEs, foundations for more market-based reforms, and reforms based on greater incentives to managers to reduce agency problems. Overall, observers regard the reforms in the 1980s to have limited success in terms of greater autonomy and incentives. Several reasons for the lackluster outcome of these measures are possible, such as (i) performance contracts alone were not enough to improve the performance of SOEs as they needed to be accompanied by an increase in product market competition; (ii) the performance criteria were inadequate; and (iii) without ownership transfers and clear property rights, greater autonomy and performance criteria were ineffective. If anything, it is likely that they may have made the agency problems even more serious.7


Reforms suffered a setback from 1989–1992 and were limited to the further freeing up of prices. The period was also marked by the high availability of bank credit and high investments, high inflation, probably some overheating of the economy, and political turmoil following the Tiananmen Square incident. Hence, reforms were put on hold from 1989–1991 and were revived only in 1992. Subsequent reforms during 1992–1997 continued on the same line as those in the earlier years. Prices of industrial inputs and outputs continued to be liberalized, domestic price structure increasingly reflected international prices, a new uniform accounting system was introduced, and a uniform value-added tax system was adopted in 1994.

6 During this time, another approach was tried on a limited scale in which SOEs were incorporated as shareholding corporations, and the shares were held by employees, other enterprises, and state organizations. However, this did not impact management behavior.

7 With managerial autonomy, agency costs may worsen because of increased discrepancy between control and ownership. Different ways to resolve the ownership costs include (i) stricter monitoring, (ii) appropriate managerial incentives, and (iii) aligning them with those of the owners.
From the late 1980s to the early 1990s, the performance contract system was scrutinized further and, after 1994, was largely abandoned. One main reason for this was the flawed performance contracts, which forced SOEs to meet performance criteria laid out in the contracts without accompanying improvements in efficiency.

One significant reform introduced earlier but carried out more during this period was increased flexibility in hiring labor. The number of contract workers (i.e., those hired on contract for a limited period without the full range of employee benefits) increased from 10 million in 1988 to about 16 million in 1991, and to 55.5 million in 1996. Another change was the increasingly large number of enterprises selling shares and listing them in the Shanghai and Shenzhen stock exchanges. However, it is believed that the listing on the stock exchanges did not improve SOE corporate governance practices or bring in modern corporate governance cultures, as management continued to be selected by the government rather than by a board of directors.

Other developments that took place at this time—which set the stage for the big privatization move in the years ahead—was the expansion of foreign direct investment from $11 billion in 1992 to $27 billion in 1993, and to $40 billion a year in 1996. Faced with competition, the performance of several SOEs deteriorated, and SOEs continued to borrow heavily from state-owned banks, with little regard to the credit worthiness of their projects or to the rate of return that they would generate. Inflation escalated again, and although interest rates were raised, real rates remained negative. Against the backdrop of these developments, the central bank resorted to credit control by imposing credit quotas on banks. However, this worsened the problem as SOEs defaulted on their payments to other SOEs.

Perhaps, in view of these challenges, at the end of 1993, the Communist Party of China adopted the following reform priorities in the third plenary session of the 14th Congress: SOEs would be transformed into modern enterprises, ownership would be diversified, a competitive market would be created for state and non-state enterprises, and the social security system would be reformed. Corporatization would be the favored method of enterprise reform, state ownership would be maintained in key industry and infrastructure sectors, various forms of ownership would be encouraged, and bigger enterprises would be retained while smaller ones would be let go. These objectives were reaffirmed in the 15th Congress in 1997. In 1995, the central government formalized the privatization policy through Zhuada Fangxiao (i.e., keep the large and let the small go). The term gaizhi also came into use at this time. In 1999, the National People’s Congress changed the constitution to endorse these decisions.

Ownership transformation in subsequent years was clearly based on these priorities. The privatization phase of SOE reforms can be said to have started in the early to the middle part of the 1990s. In this phase, the reforms were extended to allow for the privatization of small and medium-sized enterprises. The privatization began at the local level, together with the privatization of TVEs in rural areas.

---

8 In a speech around this time, President Jiang Zemin said “a socialist state does not need to have the state sector as the predominant actor in the economy to maintain its socialist nature.” See Gang et al. (1998).
Having steadily laid down the institutions of a fully market-determined economy for almost one and a half decades, authorities probably felt more confident about carrying through and managing public opinion on the issue. Perhaps foreseeing the inevitable, they laid down extensive groundwork beginning in the early years of the reforms to ease the cost of transition on labor. These were matched by further reforms in social security policies, such as an unemployment insurance fund established for laid-off workers in 1992. Subsequently, this fund was superseded by two provisions—one provided unemployment insurance to laid-off workers for 2 years, and a second provided an allowance for xiagang workers. Enterprises set up reemployment centers with the help of public funds, and a national health insurance system was established.

To summarize, while explicit reforms slowed down during this decade and the performance of TVEs and SOEs deteriorated, the stage was set for a more market-based economy. Major efforts included freeing up prices, initiating necessary labor reforms, setting up and reforming the social security system, and building the necessary political consensus by reaffirming these reform priorities, and by bringing in the required constitutional amendments.

Ownership Reforms Since the Mid-1990s

During the phase of accelerated restructuring that began in the mid-1990s, the share of SOEs in industrial activity declined from about 60% in 1995 to 22% in 2001. As Figure 1 shows, the rise of foreign-funded enterprises was equally impressive during this period, and in 2001, these overtook SOEs in terms of contribution to industrial activity.
Figure 2 shows the share of SOEs, collective enterprises, and private enterprises (both domestic and foreign) in industrial output. From being owned completely by SOEs and collectives in 1978, the sector witnessed an increase in the share of collectives (on account of the increase in TVEs in 1980s), a decline in the share of SOEs, and an increase in the share of the private sector. By 1998, the share of the private sector had increased to almost one-third. Commensurate with this was the decline in the number of employees working in SOEs. In 2001, SOEs accounted for only one-third of the workers in the industrial sector, compared to two-thirds in 1995 (Figure 3). The number of employees in SOEs almost halved from 110 million in 1995 to about 62 million in 2001, and remained at that level through 2005.

The trend in ownership change has continued in the 2000s, and more recent data show that the ownership of SOEs has been diffused further through sales of smaller enterprises and by encouraging these to be replaced by joint ventures and by wholly privately owned enterprises. The current ownership structure in the PRC is quite diverse and comprises enterprises under many different forms of ownership—state-owned, joint ventures, partnerships, wholly owned, and foreign. SOE reforms

---


---

SOE reforms have not yet been extended to the services sector in the PRC, but researchers and policy makers are unanimous on the need to extend reforms to SOEs that provide services, often called public service units. It seems that the major reform efforts in the future will probably focus on state-owned service providers. According to a World Bank estimate, the PRC has more than 1 million public service units, which mainly provide public services and employ around 30 million workers. The services are mostly provided by the state, and the involvement of the private sector in services sector is limited in the PRC.
Figure 2: Share of Various Types of Enterprises in Industrial Output (%)

- **State-owned enterprise**
- **Collective**
- **Privately owned (domestic and foreign)**


Figure 3: Share in Industrial Employment, by Ownership (%)

- **State-owned enterprise**
- **Foreign-funded enterprise**

have mostly focused on the secondary sector, but within the secondary sector—at least at a two-digit classification level—reforms seem to have extended uniformly to various activities. As Figure 4 shows, the share of SOEs in various industrial activities had come down to about 25%–50% by 2003. Unsurprisingly, the decline in the SOE share seems to have been picked up by foreign enterprises, which contribute more to the output of several industrial activities than SOEs.

In terms of sector or geographic sequencing of reforms, the reforms at the enterprise level were determined by the size of the enterprises and their economic performance. Thus, the smaller enterprises and those that were not economically viable were restructured first. The pace differed across provinces, that is, progress was faster in some provinces, such as Shandong.

**Modalities of Reforms**

This section discusses the various modalities of SOE reforms, including the forms of *gaizhi*, valuation, transfer of assets, and the roles played by various stakeholders in the process.
Forms of Gaizhi

Modes of restructuring and privatization include public offering, internal restructuring (through incorporation and spinning off), ownership diversification, employee shareholding, open sale, and leasing. Within privatization alone, the extent of privatization or the way it is conducted (i.e., valuation of the enterprise, who is allowed to participate, and who retains the controlling share) can have important implications on the performance of the enterprise, social equity issues, building consensus, and the political economy of reforms.

Unless controlling rights are transferred to the private sector, full efficiency gains cannot be realized. Also, it seems from cross-country and PRC-specific literature that for social equity, it is important that the sale of shares is extended to employees and not only to managers or the public. Empirical evidence also shows that the largest gains from privatization were obtained when the valuation and sale were conducted in a transparent manner, when the general public was allowed to participate, and when the controlling rights were transferred to the private sector, which in turn, operates in a competitive environment (which often means that the sector is opened up for private entry at the same time that the erstwhile state-owned units are privatized).10

On the whole, PRC policy makers seem to be fully aware of these considerations, and policies were formulated at different times based on these considerations. Since gaizhi was a decentralized process, there was significant regional variation in its form and outcome. The exact mode of gaizhi was based on local conditions, including the health of the enterprises and the fiscal positions of the local governments. An empirical exercise conducted by the World Bank shows that regional, governmental factors mattered more for the form of gaizhi employed than firm-level characteristics. The stronger the fiscal position of the local government, the more likely it was for firms to go through a form of gaizhi other than internal restructuring (Garnaut et al. 2005). Results from a survey conducted by the World Bank show that while privatization was the preferred mode in the faster-growing regions of the south and southwest, in the lagging north and northwest, gaizhi was more about internal restructuring. Restructuring was not a one-off event but involved several rounds of gaizhi.

The most common form of gaizhi, especially in the initial years (and probably because it encountered less resistance), was employee shareholding. Several modes of employee shareholding were allowed (e.g., as a limited liability company, as an employee shareholding cooperative, or as a block shareholding company). Employees often used compensation given by local governments for their removal from state employee status to buy shares of SOEs. They were also granted flexible payment options if they did not have sufficient funds. However, in subsequent rounds of restructuring, management consolidated their shareholdings, and there were several cases of management buyouts, many of which were controversial. Hence, in more recent years, the regulator, the State-Owned Assets Supervision and Administration Commission (SASAC), has discouraged management buyouts.

Other popular modes of restructuring were open sales and leasing. Minority stakes were offloaded through initial public offerings or private offerings of equity, though the

---

10 See Yusuf et al. (2005) and Megginson and Netter (2001).
state remained the majority shareholder. In more recent years, open sales have been conducted as well and, in some cases, joint ventures were formed with domestic or foreign firms. Often, enterprises were leased out to outsiders or former employees, especially when lessees did not have enough money to buy the firm.

Several enterprises also went through internal restructuring. The two main forms of internal restructuring were (i) incorporation, which became popular after the Company Law came into effect in 1994; and (ii) spinning off, which involved splitting the firm into smaller firms with the old firm being the controlling firm. In many instances, spinning off was used as a measure to separate assets into a separate firm, while the liabilities remained with the old firm and were often defaulted.

Finally, after the Bankruptcy Law was introduced in 1988, bankruptcy and reorganization were used as means to restructure SOEs, especially in the mid-1990s. This led to an expected abuse of this provision—SOEs would file for bankruptcy to avoid paying their debts, so the rules had to be tightened. Debt–equity swaps were also introduced in 1999, and the four major state banks established four asset management companies to deal with nonperforming loans.

Over time, the popular form of gaizhi changed. While bankruptcies and employee shareholding were more important at the start, these gave way to open sales and leasing in the early 2000s. Bankruptcies were common in the mid-1990s. With the passing of the Bankruptcy Law, the central government provided funds to write off the bank debts of bankrupt SOEs. In the late 1990s, employee shareholding became more important (one-third of the gaizhi in 1999 involved employee shareholding). Since the early 2000s, open sales and leasing have become more common forms of gaizhi. As Figure 5 shows, in 2002, gaizhi that involved employee shareholding, open sales, and leasing each constituted a quarter of the popular forms employed. Bankruptcy and internal restructuring each constituted 10%.

**Figure 5: Forms of Gaizhi in 2002**

![Diagram showing forms of gaizhi in 2002](source: Garnaut et al. 2005.)
The process of privatization through issuance of shares picked up momentum in the 1990s after capital market reforms allowed enterprises to get listed on stock exchanges. This set in motion the process of share issue privatization (SIP)—a privatization process that is unique to the PRC. In contrast to most other countries, where SIP involves trading of government shares in secondary markets with the buying and selling resulting in a change in nature of shareholders, in the PRC, government shares in SOEs were not put up for sale. Rather, productive assets and employees of SOEs were pooled into a new shareholding company, which, in turn, sold new shares to private investors and retained the proceeds obtained from such sales. As a result, instead of a change in shareholder portfolio, the equity base of the company itself enlarged (Jiang et al. 2006).

### Valuation and Transfer of State Assets

Several elements of the *gaizhi* process were common across its different forms: the valuation and transfer of assets, determination of the net worth of the enterprises, settling of existing debts to banks or dues to employees, and granting of land use rights (see Box 2 for the typical steps in the *gaizhi* process). The *gaizhi* process entailed several steps: (i) nonproductive assets were separated and handed over to local governments along with employees to manage and turn around; (ii) assets were valued by an asset valuation agency, which was verified by the local asset management agency; and (iii) the proposal was submitted to the local SOE reform office.

The government set up three funds to help finance the *gaizhi* process, particularly for firms with little or negative net worth: (i) state asset exit funds, (ii) SOE bankruptcy provisional funds, and (iii) funds to help prepare for enterprise reform. The resources for these funds came from the transfer of ownership rights, and from selling and leasing of state assets. These funds provided loans to help meet the cost of deploying labor, or of restructuring, especially when the net worth was negative. Richer provinces found it easier to set up these funds, while poorer areas demanded greater help from the central government.

### Box 2: A Typical *Gaizhi* Proposal

A *gaizhi* proposal usually has the following elements.

- **A summary of the enterprise.** Name, sector, affiliation, main product, number of employees (including laid-off workers), occupied land area, asset structures.
- **Performance.** Key indicators of performance during the past 3 years.
- **Enterprise assets: current status and proposal for disposal.** Total assets, debts, and net assets (both book value and market or current valuation), proposal for dealing with net assets and the land.
- **Redeployment of workers.** Proposal for redeploying workers, contract for redeploying workers, pension, and medical coverage for retired workers.
- **Form of *gaizhi*.** Form, scope, and content of *gaizhi* (e.g., governance structure).
- **Post-*gaizhi* business operation.**
- **Post-*gaizhi* development planning and forecast of economic efficiency.** Investment plan, governance structure, efficiency, and risk analysis.

Source: Garnaut et al. 2006.
Asset valuation. The asset valuation industry is nascent in the PRC, having come into being in the late 1980s. The industry is regulated by the 1991 State Council Regulation on the Management of State Asset Valuation. There are several methods for valuing business assets: (i) historical cost and realized profits, (ii) replacement cost and business income, (iii) current cash equivalents and realizable income, and (iv) discounted cash flows. However, sharp fluctuations in asset prices, underdeveloped capital markets, and insufficient information often made it difficult to arrive at fair asset valuations. The approach that was best understood and widely applied was the cost approach. Finally, since the fees of the valuers depend on the valuation and they fear being penalized if they undervalue state assets, valuation companies are often believed to have overvalued state assets. In fact, foreign investors often complained about SOEs being overvalued. There was also a concern that vested interests made the valuers undervalue the assets.

After the valuations, governments are often willing to settle for less than valuation prices. This happens, for example, if it receives the entire or a substantial fraction of the payments upfront, or when employment is secured post-gaizhi. Moreover, smaller firms as well as firms in which employee shareholding is the mode of gaizhi, often get a discount on the valuation price.

Debt obligations. A typical SOE is highly leveraged and may have obligations in the form of bank debts, unpaid taxes, overdue wages, pensions, and social insurance payments. Though they always had nonperforming loans from state banks, these became especially apparent after the financial system reform of 1992. Banks, in general, had little leverage in recovering their debts. Some of them tried to freeze deposits of SOEs with nonperforming loans, but this resulted in further defaults, and SOEs resorted to cash transactions. While the government canceled the debts of many larger SOEs, the smaller SOEs wanted similar treatment. As mentioned earlier, enterprises often resorted to spinning off or bankruptcy to avoid paying off their debts.

Land-use rights. Land used to be owned by the state, and SOEs used it free of cost. The Land Law, enacted in 1998, stipulated how land should be used to earn revenues. There are four ways to allot land use rights: appropriation, leasing, buying, or converting land-use rights into equity.

Various Stakeholders and the Roles that They Played during Gaizhi

Various stakeholders were involved in the reforms of SOEs, and they often had conflicting objectives. Stakeholders included the central government and its various arms, including state-owned banks that had extended credit to SOEs, suffered bad debts, and were interested in the restructuring and in recovering their dues. The four major banks belonging to the central government were the SOE sector’s largest creditors. Other stakeholders included the Ministry of Finance, which wanted to minimize the fiscal stress arising from the mounting losses of SOEs, and the Ministry of Labor and Social Security, which wanted to minimize the costs of restructuring on labor. Some local governments wanted the SOEs that they owned to turn around but wanted to protect labor at the same time.11 Finally, the employees,

---

11 In principle, the central government owned the SOEs, but in reality these were owned and controlled by local governments. The official transfer of ownership was done at the 16th National People’s Congress.
managers, creditors, public, outside creditors, and investors also had a stake in the process.

While the interests of local governments, banks, and the Ministry of Finance were aligned on one hand, those of local governments and the Ministry of Labor and Social Security were aligned on the other. Local governments weighed the pros and cons of transforming SOEs by assessing the fiscal burden imposed by SOEs that were losing money and comparing them against privatization receipts adjusted for the cost of restructuring. The public played a passive role in the process partly because they were not informed adequately or ahead of time. The public entered the debate in the late 1990s when a large number of TVEs were sold to their management allegedly at prices that seemed lower than the valuation of their assets.

**Labor Reforms and Restructuring During the Reforms**

The labor market in the pre-SOE reform period was characterized by overstaffed SOEs in urban areas. There was surplus labor in rural areas as well, in the form of low land–labor ratios. The labor market was characterized by significant rural–urban segmentation, prohibiting movement of people across rural and urban areas and also within urban and rural areas. In the pre-reform period, urban workers in SOEs received greater social and livelihood security. In general, employment in SOEs was fully secure, with firms having no rights to fire their employees, which resulted in little motivation on the part of the workers and consequent low productivity. According to one estimate, about 20%–30% of SOE employees were redundant prior to the reforms (Yao 2007).

Labor reforms were an integral part of the enterprise reform process. In this section, the four aspects of the labor reform process are discussed. First, softer reforms were initiated in the earlier years of the reforms, which tried to increase the absorption into TVEs of labor that was rendered surplus by enhanced agricultural productivity. In the earlier years of the reforms, as TVEs expanded, they absorbed labor from agriculture. The surplus workers were identified (Gang et al. 1998) and were supposed to leave their jobs and become “left-post” workers. These workers maintained their relationships with the enterprises but were not employed in the main production lines. They were enrolled in retraining programs, engaged in sideline production, or were on extended unpaid leave. Against this backdrop, some of the earlier reforms introduced were bonuses in 1979 and piece wages to improve labor productivity. Simultaneously, the government encouraged self-employment (Debroy 2008). In 1983, a “job holding without pay” scheme was instituted, which allowed employees to try to find other jobs while being on leave from SOEs for a few years. Several thousand personnel exchanges were set up to facilitate such transfers.

The second aspect of the reforms was the increased flexibility provided to the enterprises to hire labor on more flexible terms, mostly to hire workers on a contractual basis. This was one of the most important reforms, and it had a greater impact on urban workers than on rural workers. It was a prerequisite to the deeper reforms that followed (Debroy 2008).

---

12 See Zeng (2005) and Gang et al. (1998).
The third aspect of the reforms was the far-reaching and deep reforms in the social security system. These included pension, unemployment, and health benefits. Finally, to ease the transition for laid-off workers, extensive measures for retraining, reemployment, and compensation were used, which are discussed later in this section.

Social security system. The success of SOE reforms depended on the parallel implementation of reforms in the social security system. The three main components of the current social security network are unemployment insurance, medical insurance, and pension insurance (Yao and Lai 2007). Prior to enterprise reforms, individual enterprises bore the main burden of providing benefits to their employees. Thus, if an enterprise closed down, not only would it put its existing employees out of work but would deprive them and existing retired employees of pensions. Social security reforms were aimed at delinking the benefits from state enterprises; introducing cost sharing between employers, employees, and the government; and pooling resources across enterprises within a jurisdiction. As a result, the government decided to revamp the insurance system by passing a series of far-reaching regulations (Yao 2007).

The government adopted a three-tier social security system. First, laid-off workers were entitled to receive a living allowance from reemployment service centers for 3 years. This was followed by unemployment insurance for another 2 years, assuming that the workers remained unemployed at the end of the first 3 years. Finally, if they still remained unemployed, they were allowed to apply for the urban minimum living allowance. Over time, there have been efforts to consolidate these systems with the new laid-off workers now directly obtaining unemployment insurance (Zeng 2005). However, the social security network is struggling to cope with problems of limited funding and coverage, as well as irregularities like payment arrears and improper implementation (Zeng 2005).

The system is mostly confined to urban areas, and a significant number of the self-employed and private and joint-venture companies are not covered. The new regime extends to non-SOE employees, and aims to include laid-off and ex-SOE workers as well. There are ongoing attempts to include the informal sector into the system's coverage. This has important implications for ex-SOE employees, as many are currently engaged in community services coming under the purview of informal sector activities.

Pension reforms. Pension reforms began as early as 1978 and were aimed at extending the coverage of the pension system to the nonstate sector. In 1986, pensions were pooled across enterprises at the municipal level and were separated for contractual workers and regular workers. Unlike in the past when SOEs bore the entire responsibility of providing social security to employees, the current unemployment insurance for urban employees is financed, apart from enterprises, by the employees themselves, insurance interest, and government subsidies. In 1991, the State Council introduced a system of universal pooling of pension insurance. In 1995, there was a transition from a pay-as-you-earn system to one that involved a partial accumulation of funds, and the concept of individual contributions for pensions was introduced.

---

The growth of the current system was facilitated by a State Council circular passed in 1998 that provided for pooling of pensions at provincial levels (Garnaut et al. 2005). The present pensions combine defined benefits and contributions, with individuals also assuming responsibility for determining pensions through their contributed premiums.

**Health and unemployment.** The medical insurance system has also undergone fundamental changes and has shifted to a combination of social pooling and individual contributions. The principle of social pooling with individual accounts has also been extended to medical insurance. Individuals contribute a part of their medical expenses. A bylaw passed by the State Council in 1999 entitled urban employees (i.e., in SOEs, collectives, foreign-funded enterprises, and other enterprises) who have paid unemployment levies for at least 1 year to be eligible for unemployment insurance. The unemployment insurance funds are vested with unified management at the municipal level in large cities. The fund not only pays for unemployment benefits, but also for the medical costs of unemployed workers for a maximum of 24 months.

Similar to the bylaw on unemployment insurance, another bylaw passed by the State Council in 1999 entitles urban residents to a minimum living standard that varies according to local costs. Residents with family incomes lower than the minimum standard are entitled to be compensated by the government. This is enforced in 30 out of 31 PRC provinces (Garnaut et al. 2005). This measure, in addition to unemployment insurance, has helped laid-off workers get by, particularly those who have found it difficult to get jobs following restructuring. There has been a significant increase in the central government expenditure on social security in recent years as well, as it increased from 1.0% in 1997 to 6.3% in 2002.

Finally, while the social security reforms did cushion the labor force from the effects of retrenchment and set the stage for wider reforms, some proactive measures were used when workers were retrenched. The reforms resulted in employment in SOEs declining by 27 million workers between 1995 and 1999, and by another 17 million workers between 1999 and 2003 (Figure 7).

The impact on labor was handled quite impressively. Despite significant reductions in the number of people working in SOEs, there did not seem to be a large overall impact on employment. A decline in overall employment or a decline in the industrial sector employment during this period has not been observed. To a large extent, it seems that the workers were reemployed in the restructured entities or elsewhere; therefore, the total employment or the employment in the secondary sector was not impacted (Figures 6 and 7). It also seems that some reemployment has probably been to the services sector, since the share of employment in industrial sector has been stagnant while that in the services sector has increased.

Given the significant sociopolitical repercussions of job losses, the government undertook several measures to ensure that the transitions occurred as smoothly as possible. To safeguard the interests of the employees, the central government required that every gaizhi plan be approved by a conference of the employees. The government obligated the departments in charge of SOEs, departments for labor administration, and

---

14 According to Cai (2002), the facts that the larger enterprises were not restructured nor privatized and that the laid-off workers in different enterprises may have different objectives—thus, their interests may not align—explain why there was very little combined resistance by workers across enterprises.
trade unions to help SOEs redeploy their surplus workers. In 2003, the State-Owned Assets Supervision and Administration Commission (SASAC) issued guidelines that ordered restructuring plans concerning the resettlement of employees be approved by employee representatives. A security fund was set up in 1993 to help employees who lost their state jobs. The fund was later replaced by two allowances: unemployment insurance (to benefit the unemployed state and non-state employees) and allowances to xiagang. Some policies varied regionally but, on the whole, these were similar.

Figure 6: Employment in State-Owned Enterprises in the People’s Republic of China

![Figure 6: Employment in State-Owned Enterprises in the People’s Republic of China](image)

SOE = state-owned enterprise.

Source: Constructed by authors using National Bureau of Statistics data, various years.

Figure 7: Total and Sectoral Employment in the People’s Republic of China

![Figure 7: Total and Sectoral Employment in the People’s Republic of China](image)

Source: Constructed by authors using National Bureau of Statistics data, various years.
The Supreme Court also required the settlement of labor claims to be the first priority in the case of *gaizhi* and bankruptcy. Workers were often compensated for losing their state employee status, usually in the form of shares of the enterprise that underwent *gaizhi*, even if they retained their jobs. Furthermore, the displacement of labor was accompanied by simultaneous programs of retraining to ensure that the laid-off employees had opportunities to develop better capacities. These programs began in 1994 and were expanded in scope in the late 1990s.

According to one estimate, 30 million workers have been laid off since 1998, and about 8.7 million have not been able to find jobs. Some labor disputes and social unrest ensued, but these have been muted. The social security system cushioned the effects on them, and the private sector absorbed many of the workers.

One consequence of employee conferences playing active roles in the reform agenda was to push those restructuring plans where employee interests were more secure in post-remuneration, e.g., the restructuring plans with employee shareholding. Employee involvement was crucial in minimizing discontent and resistance to privatization. The prospect of becoming shareholders not only indicated a larger say in the running of the companies' post-restructuring, but also the possibility of earning profits over and above their wages.

**Retraining and reemployment centers.** As mentioned earlier, the restructuring of SOEs and the concomitant displacement of workers were accompanied by extensive retraining arrangements. As SOE reforms gained pace from the mid-1990s, laid-off workers were provided a safety net under a reemployment program known as *xiagang*. Each SOE had to set up a reemployment center to take in unemployed and *xiagang* workers. Under this program, employees could register and stay with the reemployment centers until they found a job for up to 3 years without being paid formal salaries. The centers provided retraining, job search assistance, and unemployment benefits. The latter was a monthly remuneration lower than the wages that the employees used to earn. Each SOE was required to consult with the employee representative committee at least 15 days before employees were made redundant. *Xiagang* workers had to sign a contract with the center to receive the living allowance for the next 2–3 years or until reemployed. They became officially unemployed after that and received unemployment insurance for 2 years, after which they were given a minimum living allowance.

Between 1998 and 2001, about 13 million *xiagang* and unemployed workers found jobs through the centers. The benefits from these programs were mixed. While a large proportion of displaced workers are reported to have found new jobs, some results showed that middle-aged workers, often with lower skill and education levels, as well as women, were less likely to find a job (Appleton et al. 2002). Moreover, the success of retraining programs varied widely between provinces. In Hunan, 72% of displaced workers found jobs after retraining, while in Xinjiang, Uygur Autonomous Region, the proportion was only 27% (Zeng 2005).

From about 9.5 million at the end of 1999, the number of workers at reemployment centers dropped to about 6.4 million by the end of 2002. While part of the reduction was certainly on account of workers getting new jobs, the rest might have
The reemployment centers were financially supported by both the central and provincial governments. The financial requirements of the centers were estimated through a carefully crafted bottom-up approach. Provincial labor bureaus made initial financial assessments based on the volume of layoffs and training requirements in their territories. These requests were forwarded to the Ministry of Finance at the centers, which, assuming the requests were justified, included the outlay in its budget and transferred the same to local finance departments. The latter forwarded the funds to the provincial labor bureaus, which, in turn, passed them to different SOEs.16

16 This mechanism was explained to the authors by the officials of the Ministry of Labor and Social Security.
On their part, the SOEs were required to report at the end of every financial year the number of workers trained, the nature of training provided, and the number of workers that became reemployed. During 1998–2003, the central government's total expenditure on training was estimated at around CNY40 billion.\textsuperscript{17} The authorities also sought the help of United Nations organizations like the International Labour Organization (ILO) in developing training modules.\textsuperscript{18} ILO collaborated with the Ministry of Labor and Social Security for designing retraining and job creation schemes, including those for the \textit{xiagang} workers (Brooks and Tao 2003). These centers were closed down in 2005, and the \textit{xiagang} workers moved to regular unemployment rolls.

To summarize, labor reforms began around the same time as the other reforms. Reforms were subtle at first, and were mostly confined to identifying surplus labor and encouraging self-employment. Then contractual labor was allowed, and enterprises were granted greater flexibility in hiring and firing labor. Large-scale layoffs occurred from the mid-1990s onwards. Efforts were made to minimize the impact on labor through extensive reforms in the social security system, retraining and reemployment efforts, negotiations with the new owners, compensations to workers, and payments of arrears. Thus, while overall labor was impacted, the effects were largely contained. However, despite these efforts, there was some evidence of discontent among workers. The increase in unemployment rate during 1995–2002 precipitated some labor unrest and reflected the increase in the number of labor disputes.\textsuperscript{19}

**Fiscal costs and the effects on financial sector.** The SOE reforms were fiscally neutral. In most cases and on average, privatization receipts, leasing receipts, and proceeds from the sale of land-use rights were sufficient to fund the transformation, particularly repayment to labor. The implications for the financial sector are probably not as neutral. Since state-owned banks were the main source of credit to SOEs, the strength of their portfolios was linked closely to the health of SOEs. In general, SOEs faced soft budgets, as they could borrow from the state-owned banks. This was true even during the early years of reforms and when SOEs were semiprivatized. Thus, when the profitability of the SOEs decreased, it affected the banks. This was more true during the reform process. The SOEs treated loans from the banks as money owed to the government, and as such, these were given the least priority for repayments. Employee claims and outside creditors were given repayment priority. In addition, enterprises often filed for bankruptcy or spun off assets to avoid paying their dues to banks and other creditors. Hence, the number of non-performing loans of banks increased during the restructuring, even as the four major banks created asset management companies to recover some of their bad debts.

\textsuperscript{17} As reported in the meeting of the authors with officers from the Ministry of Labor and Social Security and other academic experts.

\textsuperscript{18} The Start and Improve Awareness Initiative is an example.

\textsuperscript{19} Estimated to have gone up from 4.0\% to 7.3\% during the period (Garnaut et al. 2005).
Economic Gains from the State-Owned Enterprise Reforms

Given the multitude of reforms that have been implemented in the PRC since 1978, it is perhaps not easy to isolate the effects that can be attributed to the reforms and privatization of SOEs. However, based on existing literature on this issue, the effects of gaizhi can be examined on two levels. First, at the macro level, one can compare the performance of SOEs with that of privately owned enterprises. Second, one can compare the performance of the same enterprise before and after gaizhi. In the latter, one can also relate performance improvements to the specific kind of ownership structure. Both kinds of evidence suggest that the effects of economic reforms on the PRC’s economy have been extensive and wide-ranging.

In terms of output per worker, foreign-owned enterprises in the PRC are the most productive, followed by the privately owned enterprises. SOEs are the least productive. Figure 8 shows the output per worker in SOEs as a ratio of the output per worker in non-SOEs (including both domestic private and foreign-funded enterprises) as well as a ratio of output per worker in foreign-funded enterprises. As is clear from the figure, output per worker in SOEs is significantly below that in privately owned enterprises; it is even lower and in the order of 50% of the output per worker in foreign-owned enterprises. Thus, ownership transfer to private domestic and foreign investors has resulted in an increase in the overall productivity of the economy.

Figure 8: Output per Worker, by Ownership

Exports have played an important role in the economic prosperity of the PRC’s economy, and ownership transformation has been instrumental in the export performance of the enterprises. As privately owned firms have been most efficient domestically and, hence, competitive abroad, they have engaged in exports. In Figure 9, the export intensity of foreign-funded firms across different industrial sectors is represented. The figure shows that foreign enterprises in general export a large percentage of their output.
State-Owned Enterprise Reforms in the People’s Republic of China

With SOEs going through gaizhi, the profitability of remaining SOEs has improved significantly in recent years. For example, profits of industrial SOEs have increased from 0.7% of gross domestic product (GDP) in 1998 to 3.3% of GDP in 2003, though it remains substantially below the profits earned by non-SOEs. Overall, SOEs became profitable over time and are now in a position to distribute profits. Existing evidence shows that the non-SOEs are more efficient, innovate more, and spend more on research and development than the firms owned by the state.20

The performance of enterprises is also seen to depend on the different forms of gaizhi. Evidence from a survey of about 700 gaizhi firms conducted by the World Bank finds that there are interesting differences among them based on the mode of restructuring. The results show that firms restructured through public offering or employee shareholding performed better than those that were internally restructured. In fact, the same survey ranks the different restructuring mechanisms as follows (from worse to best): internal restructuring, management buyout, employee buyout, public offering, and foreign ownership.

Interestingly, gaizhi resulted in a reduction in the number of managers and reorganization of boards of directors. A World Bank survey shows that almost one-third of the managers were laid off—the same proportion of labor that was laid off. Also, gaizhi firms invested more than non-gaizhi firms in new equipment and technology. The results are less clear on other performance indicators—such as overdue taxes, social security, and bad loans—of the gaizhi and non-gaizhi firms and different kinds of gaizhi firms.

20 A comparison of gaizhi and non-gaizhi firms is clouded by the fact that there might be selection issues, i.e., selection of gaizhi or non-gaizhi status is not likely to be random.
There have been debates over the impact of share issue privatization (SIP) on profitability. The evidence in this regard is mixed. Sun and Tong (2003) and Wang et al. (2004) argued that such privatization did not improve profitability and led to sharper declines in return on sales for enterprises having undergone SIP. Jiang et al. (2006), however, after adopting a match sample approach for SOEs having undergone SIPs and for those that had not, found that SIP has positively impacted profitability. Given that SOE reforms in the PRC are now trying to cope with the emerging challenges of corporate governance, more research is required on the broader impacts of the SIP process.

**Ongoing Reforms, Remaining Challenges, and Lessons for Other Countries in Transition**

While views are unanimous that *gaizhi* has been overwhelmingly successful in transforming a huge and scattered SOE sector in the PRC, there have been some features of the process—and some cases of ownership transfers—in which irregularities have been reported. In hindsight, it would be useful to draw lessons from the aspects of *gaizhi* that have been deemed successful or should have been done differently. Going forward, the challenges seem to be in improving corporate governance and building the institutions necessary to support a modern system of corporate governance in the PRC.

**Figure 10: Profits of the Industrial Sector and State-Owned Enterprises (% of GDP)**

GDP = gross domestic product.
Source: Constructed by the authors using National Bureau of Statistics data, various years.
Problems and Challenges in Gaizhi

Valuation of state-owned enterprises. The main area of concern in the gaizhi process has been the valuation of SOEs—whether the valuations were fair and aimed at maximizing the returns to the government, whether the assets were stripped at less than the market value, or whether transparency was sufficient in the process of ownership transfer. These concerns have been particularly serious in cases where firms were bought by their management, as potential conflict of interest is likely to be much more serious in these cases. Concerns have also been raised (i) on the corporate governance practices of the remaining SOEs and restructured SOEs with the majority share controlled by the government, and (ii) on the contributions the private sector is making to society, i.e., whether or not it is just engaging in profit-maximizing activities that may increase inequalities and other social and environmental costs to society.

To look into these concerns and to guide and regulate further restructuring, SASAC was established in 2003. It brought together the various functions performed by other ministries relating to SOEs. SASAC acts as a regulator and supervisor of the state assets and oversees the various aspects of transformation or privatization of the remaining SOEs.

To address concerns that the valuation was not fair in some ownership transfers, cases where the transfer took place at a value less than 90% of the appraisal were scrutinized. To avoid potential conflicts of interest, management buyouts were discouraged and not allowed for the larger SOEs. In the existing SOEs and restructured SOEs with the majority share controlled by the government, the appointment of managers continues to be a political process. However, this is against modern corporate governance practices and affects the overall efficiency and operations of the enterprises. The government should only recommend managers to the board of governors, not appoint them.

It has been felt that the ownership structure of SOEs should be diverse and mixed and, where possible, outside investors should be encouraged. A diverse mix of owners promotes natural checks and balances and brings diverse expertise on board. Another way of enhancing checks and balances can be through better-defined creditor’s rights that would allow creditors to monitor the decisions of the enterprises and ensure that these are commercially sound so that the value of their credit is intact. In addition, more disclosure and availability of information is needed so that the public can monitor the process. In that context, at the local government level, considerable advances have been made.

Corporate governance. A modern corporate system includes (i) private ownership and a competitive market environment, (ii) a mix of large firms and small and medium-sized firms with churning taking place in the latter through entry and exit, (iii) corporate governance institutions that encourage managerial initiatives and reduce agency problems, (iv) a competition policy, and (v) a system that encourages innovation.

In particular, the various aspects of corporate governance are (i) rights of the minority shareholders; (ii) appointment of managers and board of directors based on merit; (iii) separation of management and board of directors; (iv) an independent and efficient judiciary; and (v) bankruptcy laws, takeover rules, and disclosure requirements. Corporate governance will go a long way in helping the PRC achieve
a mixed enterprise structure that has diverse ownership, is of a scale comparable to more developed economies, and is geared toward maximizing shareholder value and imparting gains to society. According to Clarke (2003), a fundamental dilemma in PRC corporate governance laws stems from the state policy of maintaining controlling ownership in enterprises in several sectors. On one hand, the state wants these enterprises to run efficiently and on the other, it maintains objectives other than maximizing the wealth of the shareholders, such as maintaining employment levels and direct control over sensitive industries.

While reforming SOEs, the government retained ownership of some of the larger ones. It listed about 1,200 SOEs on the two stock exchanges as limited liability companies or limited liability share companies. The corporate governance problems in the PRC pertain to these SOEs, as well as to private shareholding companies. The idea behind listing the larger SOEs was to separate management and operations from the government and to increase efficiency. In practice, however, the government retains the controlling share in the listed SOEs. Thus, market-induced discipline does not exist, and corporate governance is not taking hold. Although ownership has been partially privatized, management has either not been replaced or, even if replaced, continued to be politically appointed. Minority shareholders have not been granted any controlling rights, with their only right being to receive dividends when distributed. Minority shareholders cannot file suits, and they have no effective rights to elect the board of directors. According to one discussant of this study, since SOEs continue to serve political purposes, further SOE reforms will be limited.

Bankruptcy, mergers and acquisitions, and minority shareholders rights are some areas of corporate governance where institutions and regulators are needed for a market economy to function. In the PRC, these functions are performed by the executive branch of the government and are thus usually discretionary. Though there is, in principle, a bankruptcy law and, in the second half of the 1990s, several thousand SOEs were declared bankrupt, government ministries decided on these often after first trying to have a healthy enterprise absorb a poorly performing company.

State-owned enterprise dividends. Another issue being debated is dividend payments by the SOEs. Apparently, SOEs have not paid any significant dividends to the government despite having earned substantial profits in the last few years. According to one estimate (World Bank 2005), the profits made by SOEs amounted to 6.5% of GDP in 2003, equivalent to 35% of fiscal revenue. Several issues are related to dividend sharing between SOEs and the government, such as who should receive the dividend, e.g., the Ministry of Finance, SASAC, or some other government agency. Currently, no government agency receives dividends regularly. There are also the questions of how much dividend should be paid, how much earnings should be retained, and how much should be paid out. While the SOEs finance the company’s investments, the government helps finance general government expenditure and helps encourage consumption.

Currently, there is no uniform policy on dividend payouts. Often, since the better performing, profit-earning firms are spin-offs from the existing SOEs, they pay dividends to parent companies that retain and use them for intragroup activities.

There is near unanimity among observers and academics that since the government bore the restructuring costs and is ultimately the owner of SOEs, it should share the profits. The issue of dividend payouts is also related to corporate governance issues. While retained earnings may go into investments, they are not subject to the
same market scrutiny that investments raised through the markets go through. Hence, a larger dividend payout to the government or the public would result in greater consumption and would also reduce the discretionary spending by managers and increase shareholder wealth.

One key challenge facing SOE reforms in the PRC pertains to reforms of state-owned banks. Four major banks accounting for almost three-fifths of the total assets of the banking system—Agricultural Bank of China, Bank of China, China Construction Bank, and Industrial and Commercial Bank of China—have been identified for reforms. Apart from recapitalization, ongoing reforms also focus on changing the legal structure and improving corporate governance standards by bringing in strategic investors. Early progress has been reasonably encouraging, though more needs to be done to increase operational efficiency and commercial orientation (Podpiera 2006).

Comparison with Eastern European Countries

What makes the PRC experience different from that of the Soviet economy and of Eastern Europe? In terms of outcome, the transformation of the PRC economy from a predominantly state-owned to a privately owned one was much smoother and yielded greater benefits. The PRC system, for one, was much more gradual. Rather than relying on “big bang” privatization, it first experimented with management-based transformation and the transformation of smaller enterprises. The reform program’s sequencing was probably also different. Rather than beginning with ownership transformation, it first freed up foreign direct investment and set up special economic zones.

Transition economies in Eastern Europe used various schemes for privatization, which have been placed in two categories by Yusuf et al. (2006). The first one—non-equivalent privatization—involves a quick ownership sale to citizens or employees. It was broadly deemed iniquitous as only a few people with resources could participate in it. The second—equivalent privatization—involves getting the enterprises valued first before being partially sold to employees and the public, with the balance retained by the government. Theoretically, this method was preferred over the non-equivalent method as it allowed broader sections of society to participate and was deemed to be a fair process.

The pace of privatization differed across countries. What should be the pace of privatization? Academic views differ on this. One view favors a fast pace as it does not give enough time for resistance forces to be mobilized, as the slow pace gives those with vested interests time to try to block it or to influence the process in a way that favors them. The other view suggests that the pace of reforms should be commensurate with the private sector’s ability to absorb laid-off workers, capacity to expand the social safety net, and availability of managers. According to this view, a rapid privatization in the earlier stages of transition may imply that only a few private individuals would have the necessary resources to bid for these and thus result in inequalities (this is what happened in some Eastern European countries), while the slow pace provides information on the SOEs to prospective buyers.

Judged by these parameters, the pace of PRC reforms seems to be right—neither too fast, as in some Eastern European countries, nor too slow (though some observers think that it could have been, and needs to be faster).

Another view is that, rather than the pace, it is the sequencing that matters for the success of the program and explains why the PRC succeeded better than many Eastern European countries. An important building block in the success of the
SOE reforms is the creation of market-friendly institutions and development of market mechanisms. Although PRC institutions and markets are a long way from the levels of developed countries and were far ahead of Eastern European countries on the eve of the privatization—e.g., prices were determined by the markets and the economy was opened significantly to trade and foreign direct investment and was thus subject to competition—SOEs had begun to face somewhat harder budget constraints. In fact, to some extent, the privatization and the institution building happened simultaneously. In general, as the PRC experience shows, institution building is endogenous to reforms.

In terms of sequencing, both Eastern European countries and the PRC have found it easier to privatize smaller retail and manufacturing enterprises because they are politically less sensitive, buyers can be readily found, and the adjustment is easier.

**Public Ownership of Industry and Privatization in India**

The presence of the public sector in India’s manufacturing is rather modest when compared with the levels that the PRC had when it started its restructuring. Also, the present structure of state ownership in India’s industry differs from the ownership structure in the early years of PRC reforms. On the eve of the reforms, the PRC’s industrial sector was either owned by the state or by collective organizations, industrial activities were conducted in several hundred thousand enterprises of varying sizes, and the ownership of these enterprises was shared between the central and the provincial and local governments. On the other hand, public sector ownership in India’s industry is much more concentrated, is mostly in industries that are capital-intensive (heavy industries), and is mostly under the central government.

Central ownership occurs in about one-third of the industrial enterprises in India, but this is concentrated in a few hundred enterprises. Because of its earlier industrial policy, with emphasis given to heavy industry and preference given to the public sector, the public sector’s presence is larger in heavy industries. The sectors in which the public sector enterprises exist are mostly monopolies and therefore are profit making—they seem to be enjoying monopoly rents rather than profits that reflect productivity. Thus, one needs to look beyond just the profitability of these enterprises to decide whether certain sectors or enterprises should be restructured or privatized and what kind of benefits this would yield to society.

Since the central government mostly owns the SOEs, restructuring and privatization efforts have been carried out by the central government in India. The first efforts were started in the early 1990s through the ad hoc sale of shares. The main objective seemed to be to create fiscal space rather than the broader objectives of diverse ownership. This involved selling shares of companies, often as a basket, to institutional investors. These were also done for shares of individual companies later on.

In 1992, the government appointed the Committee on Disinvestment of Shares in Public Service Enterprises to formulate a proper policy in this regard. The committee recommended limiting disinvestment to below 49% in industries reserved for public sector (eight industries as per the Industrial Policy of 1991). Sale of shares of SOEs slowed down in the latter half of the 1990s and picked up again in the early 2000s. During this period, “strategic” sales were carried out. The government established the new Department for Disinvestment to oversee the program. As a matter of policy, it was announced that government equity in all nonstrategic public service units will be reduced to 26% or less, and the interests of the workers would be protected. The gov-

Gupta (2005) looked at the impact of equity sales on several performance indicators, including firm profitability and labor productivity, in an econometric assessment of privatization efforts in India. She found that firms experience a significant increase in profitability, labor productivity, research and development investment and intensity, asset size, and employment after partial privatization. She found that a 10 percentage point increase in the level of private equity would increase annual sales by about 13% and profits by 10%. Gupta's results also suggested that partial privatization does not cause the government to abandon the political objective of maintaining employment.

Differences in the industrial structure of the public sector enterprises in the PRC and India notwithstanding, India can learn several lessons from the PRC. These lessons are summarized in the next section.

Summary

SOE reforms were an integral part of the reform program that the PRC undertook. The program evolved in many stages, from relying mostly on enhancing managers’ incentive structure and providing them with greater autonomy to privatization. The transitory costs of the reforms seem to have been well contained, and the massive movement of labor away from the state sector to the non-state sector seems to have been rather smooth. Hence, the PRC experience provides countries like India a rich reform experience from which to draw lessons. Useful lessons can be drawn not only from the measures that succeeded but also from those that did not, including the earlier strategy of reforming through incentives to management and not ownership change.

Lessons to Be Learned from the People’s Republic of China’s Experience

(i) Change in ownership yields efficiency gains and is beneficial for the economy. Larger benefits are reaped if the ownership structure is diverse, as it may provide important checks and balances.

(ii) The efficiency gains from ownership transformation need not come at the expense of employment losses, especially if product market competition is undertaken at the same time. Thus, the overall sequencing is important for the success of the reforms.

(iii) Delegating more the job of restructuring and privatizing to local authority may make the process administratively easier and more successful. Success in pushing through SOE reforms had much to do with delegation of reform initiatives to the provinces.

(iv) The pace of SOE reforms in the PRC was gradual in the beginning and then moved quite rapidly from the mid-1990s. The approach followed in reforming
SOEs was similar to that in other segments of the economy—calibrating the pace of reforms in a gradual and consistent manner. A gradual pace does not only yield benefits, but is also politically and socially more acceptable. Moreover, just like how the PRC started with the privatization of the smaller enterprises and with a few enterprises at first, a pilot program might be useful. In implementing a reform program that involves several sensitivities—like that of restructuring public enterprises—pilots beginning with a select few enterprises in terms of their size, nature of activity, and location can produce very useful results for further reforms, as seen from the PRC’s experience.

(v) It is conceivable to win the support of workers. This is especially easy when the economic conditions are more benign, but also if the employees are engaged in the process. This was done through several specific measures in the PRC, including by making employee conferences a key part of the ongoing restructuring negotiations. The transition for labor was made easier by several other specific measures, such as retraining and reemployment facilities.

(vi) For political acceptance, even the smaller issues, like how to describe the process or what to call it, as well as the modes and labor issues, have to be clearly thought out (e.g., the PRC called the process of privatization *gaizhi* and those who were laid off *xiagang*).

(vii) SOE restructuring in the PRC was accompanied by a radical restructuring of the social security network. The new network aims to extend to the entire workforce in the long run. Since loss of social security for laid-off workers could have been a huge potential source of unrest, the new system had to expand its coverage to include the growing group of “non-state” employees. In the PRC, SOE restructuring—particularly displacement of labor—acted as a trigger for reforms in social security, particularly in unemployment, medical, and pension insurances.
References


Segmentation and Unification in the People’s Republic of China’s Labor Market: Lessons for India

Bibek Debroy

This chapter examines the reforms in the People’s Republic of China’s (PRC) labor market as it moved from a centrally planned system to a more market-driven one. The challenges that the PRC faced in reforming its labor market yielded several important insights for India and other developing nations. This chapter briefly sketches how labor markets in the PRC and India perform in cross-country comparisons. It also describes the labor market in India, examines reforms and non-reforms, and concludes with perceptions on lessons for India from the PRC’s liberalization experience. An overview of labor market reforms in the PRC since 1978 is provided with a section devoted to macro data. The remaining segmentation in the labor market and attempts to unify it is presented with emphasis on the difference between de jure provisions and de facto implementation. The chapter concludes by looking at implications for labor market reforms in India.

Cross-Country Comparisons

For PRC–India comparisons, the most relevant data source is Freedom House’s Freedom in the World, in existence since 1972 and with data from 193 countries. This has an aggregate score, subdivided into two ratings for political rights and civil liberties. Under civil liberties, it examines rights of association and organization, including the freedom to form independent trade unions or peasant organizations and freedom to engage in collective bargaining or strikes. In the 2007 rankings, the PRC scores behind India.2

In several ways, the Freedom House rankings are too aggregated for labor market purposes, and the Economic Freedom Network index is better (Fraser Institute 2007). Its structure involves aggregation across (i) government size (regarding expenditure, taxes, and enterprises); (ii) legal structure and security of property rights; (iii) access to sound money; (iv) freedom to trade internationally; and (v) regulation of credit,

---

1 Research professor at the Centre for Policy Research, New Delhi, and a professor at the International Management Institute, New Delhi. The author is grateful to two anonymous referees and participants at conferences held in Beijing on 27 February 2008 and in New Delhi on 11 April 2008.

2 The PRC scores a 2, and India scores a 10 (Freedom House 2007b).
labor, and business. Given this chapter’s focus on labor market reforms, regulation of credit, labor, and business is most relevant, especially labor market regulations and variables that include minimum wage, hiring and firing regulations, centralized collective bargaining, mandated costs of hiring, and mandated costs of worker dismissal. In the 2007 rankings, the PRC’s score of 4.5 on labor market regulations compares with India’s score of 4.8.3 Interestingly, the PRC’s score improved from 3.2 in 1990 to 4.5 in 2005; in contrast, India’s score deteriorated from 6.3 in 1990 to 4.8 in 2005.4 This may be perceived as due to increased labor market flexibility in the PRC since the 1990s and increased labor market rigidity in India. The PRC’s improvement in scores is due to the easing of centralized collective bargaining and, to a lesser extent, of hiring and firing regulations. In India, both have also been eased (though not to the same extent as in the PRC), but India’s deterioration is largely due to minimum wage restrictions.

The Index of Economic Freedom is almost a parallel exercise to the Economic Freedom Network and is based on 10 broad factors of economic freedom (Heritage Foundation and Wall Street Journal 2007). One is labor freedom, interpreted as, for example, government restrictions on wages and hours of work. Under this factor, in the 2007 rankings, the PRC scored 63.5, above the world average of 62.3, while India scored 55.1. A slightly different impression emerges from the World Bank’s 2008 Doing Business indicators for 178 economies (www.doingbusiness.org). One of the 10 indicators used is employing workers; in this, the PRC has a global rank of 86th and India, 85th. The detailed figures for the PRC in the 2008 report show it having a difficulty of hiring index of 11, a rigidity of working hours index of 20, a difficulty of firing index of 40, a rigidity of employment index of 24, firing costs (in weeks of wages) of 91, and a nonwage labor cost (as percentage of salary) figure of 44.5 India has a difficulty of hiring index of 0, a rigidity of working hours index of 20, a difficulty of firing index of 70, a rigidity of employment index of 30, firing costs of 56, and a nonwage labor cost figure of 56. While the overall ranks are similar, India’s low relative scores are primarily associated with difficulties in firing, though firing costs in India are actually lower. However, India also has higher nonwage labor costs and rigidity of employment index values.

The United Nations Development Programme’s Human Development Report, in existence since 1990, also contain information on labor markets.6 In 2005, the PRC’s female work participation rate of 72.4% compares with India’s 42.5%, and the PRC and India are both de jure signatories to the seven human and labor rights instruments (i.e., genocide; racial discrimination; civil and political rights; economic, social, and cultural rights; discrimination against women; torture and other degrading punishments; and rights of the child), which are listed in the reports (UNDP 2006). In addition, the reports list information on ratification of eight conventions that are specific to labor—freedom of association and collective bargaining (conventions 87 and 98),

---

3 The higher the score, the better. Moreover, the thrust is that the lower the level of government intervention, the better.
4 The report for 2007 used 2005 data. For the PRC and India, such disaggregated scores are not available before 1990.
5 Higher index values indicate greater rigidity.
6 These reports are usually identified with the human development index. In the 2005 report, out of 177 countries ranked, the PRC had a human development index rank of 85 and India of 127.
elimination of forced and compulsory labor (conventions 29 and 105), elimination of discrimination in employment and occupation (conventions 100 and 111), and abolition of child labor (conventions 138 and 182). Of these, the PRC is a signatory to conventions 100, 138, and 182, while India is a signatory to conventions 29, 105, 100, and 111 (UNDP 2006). Although ratification does not mean implementation, it does signify some political will.

Upon examining these rankings, it appears that a trade-off exists between ensuring labor market flexibility and ensuring protection of core labor standards. The PRC has erred on the side of flexibility and empowerment while India has settled on protection and entitlement.

India’s Labor Market Reforms and Non-Reform

Despite entering technology, capital (plant and machinery), entrepreneurship, and land as factors in production processes, labor remains the core input. India possesses—or should possess—a comparative advantage in labor due to its high population number; it should be in a position to exploit its cost advantage in labor, especially with its strengths in science, technology, and education. To this traditional labor cost advantage is added a demographic dividend, i.e., populations in developed countries are aging, whereas in developing countries, the working age population is increasing. India’s demographic dividend angle is due to relatively younger populations in the north and relatively older populations elsewhere. There is also the employment angle, an issue of great concern to the United Progressive Alliance government.


---

7 Ratification information in the reports is derived from the International Labour Organization’s database on 180 member countries (www.ilo.org). This ratification database can be divided into three broad segments: (i) those listed by the Human Development Report; (ii) conventions that provide a basic institutional framework aimed at protecting against exploitation (e.g., convention 95 on protection of wages, convention 155 on occupational safety and health, convention 81 on labor inspection, convention 129 on labor inspection for agriculture, convention 144 on tripartite consultation, and convention 122 on employment policy); and (iii) conventions that address situations that overlap with poverty (such as convention 149 on indigenous and tribal peoples, conventions 97 and 143 on migration for employment and migrant workers, convention 183 on maternity protection, and convention 137 on rural workers’ organizations). Of the conventions listed (other than the eight fundamental conventions listed in the main text), the PRC has ratified conventions 155, 144, and 122. India has ratified conventions 81, 144, and 122.
Organized versus Unorganized Sector Dichotomy

In 2004–2005, India's total workforce was estimated to be over 415 million, with an estimated labor force of more than 428 million (Ministry of Economic Affairs 2006, Chapter 10). Of this, in March 2004, 26.4 million (less than 6.5%) were in the organized sector, 8.2 million in the private sector, and 18.2 million in the public sector (Ministry of Economic Affairs 2006, Chapter 10).

“Organized” and “unorganized” have three different—yet overlapping—definitions. First is the labor law definition. Using the Factories Act (1948) as an example, registration is required if a factory employs 20 or more people and does not use electricity, or if it employs 10 or more people and uses electricity. Registration is equated with organized labor. Second is the small-scale industry definition, in terms of threshold levels of investment in plants and machinery. Small-scale industry is often equated with unorganized manufacturing. Third is the threshold level of turnover, where excise does not have to be paid; excise exemption is another definition of the unorganized sector. With various reforms—such as the recommendations of the Second National Commission on Labour, which submitted a report in 2002 (Ministry of Labour and Employment 2002)—the dichotomy between organized and unorganized sectors should break down. Although the organized sector is regulated by rigid labor laws, liberalization will make labor market provisions more flexible. In addition, as the unorganized sector is outside of the purview of most labor laws, liberalization will extend protection to labor in the unorganized sector.

Law and Legal Systems

The term “law” can be used in many different senses. On one level, law means the aggregate of legislation, i.e., law means statutory law. A statute suggests something enacted by a legislative body, such as parliament or a legislative assembly.

Article 246 of India's constitution sets out three lists—areas where the central government can legislate, areas where states can legislate, and areas where both can legislate (“the concurrent list”). Under article 246, labor is on the concurrent list, making labor laws vary from state to state. Exceptions, such as labor and safety in mines and oil fields and industrial disputes concerning union employees, are on the center list.

There is also a body of law known as “administrative law” or “subordinate legislation.” In India, while the need to reduce state intervention and overlegislation is reasonably well appreciated, the need to simplify administrative law is less well appreciated. Administrative law is subordinate legislation consisting of rules, regulations, orders, and administrative instructions from ministries and government departments. They are nontransparent and discretionary and encourage bribery and corruption.

---

8 This implies an unemployment rate of 3.06%.
9 These figures have not changed substantially since 1990. Some smaller states and union territories are not included in these figures, but this is not significant.
10 For example, item 22 on trade unions and industrial and labor disputes; item 23 on social security and social insurance, employment, and unemployment; and item 24 on welfare of labor including conditions of work, provident funds, employer’s liability, workmen’s compensation, invalidity and old-age pensions, and maternity benefits.
Regarding labor law reform in India, old and dysfunctional laws must be eliminated. Gaps in legislation must be filled, and laws must be harmonized. State intervention and overlegislation in administrative law must be reduced, and procedural law must be efficient.\(^\text{11}\) Transaction costs associated with obeying the law must be brought down, so that people do not resort to operating in a quasi-legal or illegal framework.

The diversity of labor laws is also a problem. The first labor statute was the Fatal Accidents Act (1855), enacted over 150 years ago, during which time concepts and definitions have changed. So has case law, contributing to further confusion. Definitions of wages, workers, employees, factories, industries, adolescents, children, and contract labor lack unanimity. The Second National Commission on Labour recommended unification and harmonization of labor laws to be placed under five headings: (i) industrial relations, (ii) wages, (iii) social security, (iv) safety and welfare, and (v) working conditions (Ministry of Labour and Employment 2002).

While unification and harmonization of labor laws is a relatively non-controversial issue, reducing overlegislation and state intervention is not.\(^\text{12}\) For example, several inspectors can descend under assorted labor laws; a single inspector for all labor laws does not exist. Nor do documentation requirements or time periods for which records have to be kept. Such procedural problems characterize all three stages of an enterprise's operations—entry, functioning, and exit—and impose transaction costs that render business in India uncompetitive. Part of the problem with administrative decisions is that they are often discretionary, often at petty functional levels, thus encouraging corruption. The success of this kind of reform is sporadic, however, as it must be enacted state by state.

Most discussion of labor law reform and reduced state intervention is usually equated with Chapter V-B of the Industrial Disputes Act (1947), one of three statutes that are viewed as impinging on industrial relations in India. The first, the Contract Labour (Regulation and Abolition) Act (1970), was never meant to prohibit contract labor. Section 10 provided the appropriate government with discretion of prohibiting contract labor in selected areas. In fact, in the title of the act, regulation comes before abolition. Although some court decisions have affected flexibility, contract labor fundamentally allows flexibility and permits outsourcing.

The second, the Trade Union Act (1970), has led to multiplicity of trade unions. Under section 4, any seven people (not necessarily workers) can form and register a trade union. This influences collective bargaining because an agreement with one union is not necessarily binding on others.\(^\text{13}\)

---

\(^\text{11}\) The legal system will lack credibility if procedural law is time-consuming, no matter how good the substantive law is.

\(^\text{12}\) However, reducing state intervention should not be confined to industrial relations alone, as several other instances illustrate dysfunctional and unnecessary state intervention. The Factories Act and Shops and Establishments Act are examples. Rules under the Factories Act, framed in 1948, provide for whitewashing of factories. Earthen pots filled with water are required instead of water coolers. Red-painted buckets filled with sand are also required instead of fire extinguishers.

\(^\text{13}\) Following the recommendations of the Second National Commission on Labour, amendments have been introduced to the Trade Unions Act. The number of persons required for registration of a trade union was changed from 7% to 10% of the labor force. Not more than one-third of office bearers (subject to a maximum of five) can be nonworkers. The holding of annual elections and auditing of accounts was also made mandatory.
Chapter V-B of the Industrial Disputes Act requires government permission before layoffs, retrenchment, and closure of factories. Labor markets have thus become artificially rigid, and employers have adopted unnaturally high capital intensity and circumvent the legislation. An employer–employee relationship should be a personal contract, with an optional provision of resorting to the government in case of exploitation. However, the act makes recourse to the government—and thus to labor commissioners—mandatory. Moreover, the statute makes it impossible for companies to exit the market.

Unfortunately, changes in the act are invariably described as an exit policy for labor and a “hire-and-fire” policy. Reforms have thus been resisted, even when proposals have increased the present retrenchment package from 15 days of wages to 45 days. Attempts to introduce flexibility in selected segments, such as small and medium-sized enterprises or special economic zones, have also not succeeded.

This represents a failure to unbundle the labor market reform agenda in several senses. Although nonindustrial labor law reform is less controversial with regard to harmonizing statutes or reducing procedural and transaction costs, by equating such reforms with changes to Chapter V-B, even these reforms have not occurred. Moreover, within Chapter V-B, layoff, retrenchment, and closure provisions should be segregated. Finally, the Seventh Schedule should be amended to move labor issues from the concurrent to the state list under article 246 of the Constitution of India so that states can change as they wish. In reaction to reforms and competitive pressures designed to attract investments, some states have been more forthcoming in granting permissions under Chapter V-B. Therefore, a change in the Seventh Schedule would have explicitly allowed what was already happening.

Such non-reform in India is contrasted to what is perceived to be reform and flexible labor markets in the PRC.

Perhaps there are lessons to be learnt from China in the area of labour reforms. China, with a history of extreme employment security, has drastically reformed its labour relations and created a new labour market, in which workers are highly mobile. Although there have been mass layoffs and open unemployment, high rates of industrial growth especially in the coastal regions helped their redeployment. In spite of hardship, workers in China seem to have benefited from wage growth, additional job creation, and new opportunities for self employment (Ministry of Economic Affairs 2006, Chapter 10).

Such an impression is often formed by contrasting the rigid provisions in Chapter V-B with the flexible contractual provisions in the Labor Law of the People’s Republic of China (1995).

---

14 Subject to some state-level variations, Chapter V-B applies if the number of workers employed is at least 100. There are also econometric problems in estimating the impact of Chapter V-B, since it was amended at various points, and state-level variations exist. Two widely quoted papers on this subject are by Fallon and Lucas (1993) and Besley and Burgess (2004).
Overview of Labor Market Reforms in the People’s Republic of China Since 1978

Reforms in the PRC date back to 1978, when it changed from a centrally planned system to a more market-driven one, i.e., juyou zhongguo tese de shehuizhuyi (socialism with Chinese characteristics).

Specifically, these reforms (i) decentralized control over state-owned enterprises (SOEs) by increasing the authority of local authorities and plant managers, (ii) privatized SOEs, (iii) dismantled the rural commune system and replaced it with a household responsibility system, (iv) increased use of material incentives, (v) allowed small-scale enterprise in services and light manufacturing, (vi) opened up the country to foreign trade and investment, and (vii) improved economic infrastructure.

The reforms have been largely successful. Since 2002, real gross domestic product (GDP) grew in excess of 10% until 2007 (ADB 2009), and the PRC became the third largest economy in the world by 2008, behind the United States and Japan, overtaking the United Kingdom. In purchasing power parity terms, its economy was the second largest in the world. Per capita GDP was $2,001 in 2006 and $7,598 using purchasing power parity (IMF 2007). While serious problems of quantification and definition exist, the private sector could well account for 70% of GDP, with 200 large state-owned companies concentrated in utilities, heavy industries, and resource industries (Business Week 2005). From 1981 to 2001, the poverty ratio dropped from 53% to 8%, with most of the drop occurring in the early 1980s (Chen and Ravallion 2004). However, this was accompanied by an increase in income inequality. In December 2001, the PRC also joined the World Trade Organization after prolonged negotiations.

Within the labor market, the reforms were seen as an end to the tie fan wan (iron rice bowl) system. The system guaranteed job security, steady income, and benefit flows—realization of the “from each according to his ability and to each according to his needs” principle. This applied to the military services, civil service, SOE employees, and, with some modifications, rural employment. However, these labor market reforms must be understood against the backdrop of rural and urban segmentation, instead of as a unified whole that cut across an integrated labor market.

Until the late 1970s, the Bureau of Labour and Personnel centrally determined wages of all urban workers through a grade system, with eight grades for factory workers and 24 grades for administrative and managerial workers. Wage increases were based on seniority, not on productivity. For industrial workers, wages, housing, medical care, and retirement benefits were anchored in the danwei (work unit) (Yao 2007). In the urban sector, this led to overstaffing of between 20% and 30% in SOEs.

---

15 However, this 70% figure has been questioned (Zhang 2005). Only 40 out of 1,600 listed companies in the PRC are private, and their combined market capitalization is less than 3% of the total. Less than 10% of credit goes to private enterprises.

16 A porcelain or clay rice bowl breaks when it is dropped, thus rendering it useless. In contrast, when an iron rice bowl is dropped, it does not break and can be used repeatedly, the metaphor representing an employee who is not punished despite repeated mistakes.

17 Centrally determined wages have to be considered against the backdrop of subsidized food prices and benefits like housing, child care, medical insurance, and pensions, all of which were urban-centric.
(Yao 2007). In the rural sector, however, many benefits associated with the *tie fan wan* system were unavailable, and migration was tightly controlled through *hukou*, the household registration system. This led to over 30% of the rural labor force being surplus and prevented from playing a role in the industrialization process. From 1960 to 1978, this rural and urban labor market segmentation was estimated by the PRC scholars to have led to a GDP loss of between 20% and 60% (Figure 1), and is based on an argument of inefficient usage of labor (Yao 2007).

In urban areas, necessary reforms were obvious. First, SOEs were granted autonomy in determining wages, with incentives like bonuses and overtime, implemented through a labor contract system, thus negating the earlier principle of guaranteed lifetime employment. This also led to an increase in inter-enterprise wage differentials. Second, SOEs were allowed to convert into joint stock companies, with workers acquiring shares and becoming stakeholders. Third, redundant SOE workers—*xiagang*\(^\text{18}\)—were retrenched, necessitating retraining and redeployment, although unemployment in SOEs increased due to competitive pressures, elimination of unwanted workers, and competition that rural migrants brought into the urban labor market.\(^\text{19}\) Fourth, unemployment insurance was introduced from three sources—enterprises of former employees, the government at the center and local levels, and unemployment insurance fund.\(^\text{20}\) Fifth, social security was reformed, since loss-making and bankrupt enterprises were no longer able to fund guaranteed payments. According to article 70

---

\(^{18}\) More completely, *xiagang gongren*, literally meaning laid-off workers of SOEs.

\(^{19}\) Unemployment figures are unreliable (Cai 2004). Rural *hukou* workers are barred from registering with unemployment exchanges, even if unemployed.

\(^{20}\) The ratio is not one-third for all three sources. Although it is one-third for the basic living allowance, the insurance premium is entirely paid from the government's budget. Laid-off workers are registered with the reemployment center and, therefore, do not show up in the figures of the registered unemployed (Cai 2004).
of the Labor Law, social security covers unemployment, pensions, “sickness,” industrial (workplace) injury, and “maternity.” Sixth, as fallout of SOE reform, there was a switch in employment from SOEs to private enterprises. In 1980, 18.7% of the labor force was employed in SOEs. By 2005, the figure dropped to 8.5%. In 1980, 7.0% of the labor force was employed in township and village enterprises. By 2005, the figure increased to 18.6%.

The protection granted to xiagang needs further clarification. From 1998, a “two-guarantee” system was followed, with the first guarantee being basic livelihood for laid-off SOE workers. Many were relatively older, had lower skill and educational levels, and found it more difficult to find alternative employment opportunities. The livelihood guarantee for such workers was implemented through re-employment service centers and covered allowances for basic living expenses and payment of social insurance premiums. The second guarantee was basic livelihood for all retirees through a pension system. These guarantees were ensured through a policy known as “three lines of protection”: (i) jiben shenghuo baozhang (basic living allowance) from re-employment service centers for up to 3 years for laid-off SOE workers; (ii) if the workers did not find jobs at the end of 3 years, shiye baoxian jin (unemployment insurance payments) for a maximum of 2 years; and (iii) if jobs were still not found at the end of 2 years, zuidi shenghuo baozhang fei (minimum living allowance) to which all poor urban residents were entitled.

For poor urban residents, a system of minimum living standards was formalized in 1999 for all cities and towns, a minimum living allowance available if a family’s income was below the minimum living standards.21 In March 2005, believing that the xiagang problem was solved, the re-employment centers were closed, and the SOE two-guarantee system integrated into general social security and unemployment insurance framework. However, in the course of these reforms, the funding of benefits remains a problem and thus, retrenched workers still face poor living conditions.22

The main labor laws in the PRC’s urban sector are as follows:

(v) Temporary Regulation on State-Owned Enterprises to Implement the Labor Contract System (1986) by the State Council, a precursor to the fixed-term contractual system incorporated in the Labor Law (1995). Fixed-term contracts were already popular for foreign-invested and foreign-owned enterprises in special economic zones, and this regulation allowed new entrants in SOEs. However, in instances of privatization, old workers in SOEs were also subject to the contractual system.

---

21 Budgetary provisions are made in the budgets of local governments.
22 See Shang and Saunders (2001); Appleton, Knight, Song, and Xia (2002); and Song, Appleton, and Xia (2006).

(vii) Establishing a minimum wage system in 1993 to emphasize standards and minimum wages fixed by provincial, autonomous regional, and municipal governments, based on costs of living, average wage levels, productivity, and levels of economic development of regions.


(ix) Labor Law of the People's Republic of China (1995), consolidating some of the earlier ad hoc legislation. Although this is framework legislation and subject to rules, provisions in articles 7 and 8 are devoted to trade unions and collective bargaining; provisions in articles 3, 12, and 13 focus on equality; article 16 requires labor contracts; articles 26–32 provide for revocation of labor contracts and unbundle layoff, retrenchment, and closure provisions; and several articles in Chapter 7 are a reaction to underage workers.

(x) Trial Procedures for Industrial Injury Insurance for Enterprise Employees (1996) by the State Council.

(xi) Decision on Establishment of a Unified Basic Endowment (Pension) Insurance System for Employees of Enterprises (1997) by the State Council. All enterprises in urban areas must participate in the basic old-age insurance program by contributing 20% of the enterprise wage bill to set up a mutual assistance fund for the base pension, about 20% of the average wage of employees. The remainder of the enterprise's contribution, beyond the requirements of the mutual assistance fund, goes into personal accounts of employees. The employee contribution of 8% of personal wages also goes into the personal account. The personal account pension component amounts to 1/120th of the accumulated amount in personal accounts and can be inherited.


(xiii) Decision on Establishment of Basic Medical Insurance System for Urban Employees (1998) by the State Council. The system followed was similar to old-age insurance, with separate mutual assistance and personal account components. Six percent of the enterprise wage bill and 2% of personal wages are paid as medical insurance premiums. Part of the enterprise contribution goes into the mutual assistance fund and part into the personal account, while the entire employee contribution goes into the personal account. The mutual assistance fund primarily covers hospitalization

---

23 However, the word “laborer” is never defined in this statute. Consequently, in practice, those other than rural laborers, domestic workers, senior government officials, and civil servants are left outside its ambit.

24 These reports were for export-oriented sectors such as toys, fireworks, and textiles and garments, and usually for coastal areas and special economic zones. The system for supervision of labor security was established in 1993.

25 Reforms of the old-age insurance system had actually begun in 1984, but were formalized later.

26 However, for employees and retirees from the government system, the old system remained unchanged.

and chronic outpatient services, while the personal account covers general outpatient services.

(xiv) Regulations on Unemployment Insurance (1999) by the State Council. Before 1999, laid-off SOE workers were registered with re-employment centers and received their subsidies from them. The 1999 regulations permitted the transition to an unemployment insurance system, as these reforms began in 1986. Enterprises pay 2% of the enterprise wage bill, and employees pay 1% of personal wages as premiums. The monthly value of unemployment insurance is set at a figure lower than the minimum wage but higher than the minimum living allowance.


(xvi) Probationary Methods on Collective Bargaining of Wages (2000), a document released by the Ministry of Labor and Social Security on collective contracts between enterprises and trade unions or other representatives recommended by employees. These collective contracts can cover issues like working hours, rest and vacation, labor safety, labor hygiene, insurance, and welfare.

(xvii) The Ministry of Labor and Social Security, All-China Federation of Trade Unions (ACFTU), and China Enterprises Association jointly established the State Tripartite Conference System of Labor Relations Coordination in August 2001 and convened the first national tripartite conference of labor relations coordination, formalizing a tripartite coordination mechanism for labor relations.28

(xviii) Procedures for Industrial Injury Insurance (2003) by the State Council.29 Industrial injury premiums are paid by enterprises, not by employees. The rate of premium varies depending on the sector, location, and nature of the enterprise. The scheme is not mandatory, but if enterprises opt out, they have to cover the industrial injury expenses on their own.


28 A system for handling labor disputes was reestablished in 1987. There is a provision for mediation at the enterprise level through a labor dispute mediation committee. If mediation does not work, one moves to arbitration through a local labor arbitration committee. If this, too, does not work, there is the court system. The original 1987 provisions were for state-owned enterprises (SOEs) alone, but they were extended to all enterprises in 1993. Mediation was popular before 1993, and between 1986 and 1992, mediation committees resolved 710,000 out of 1 million labor disputes. Yet since mediation is not mandatory, it has begun to fall out of fashion. Most labor disputes are in coastal provinces, suggesting that they are mostly related to migrant workers and issues like remuneration, social security, and termination of labor contracts. As mediation declined, the importance of arbitration and the number of cases settled through arbitration increased from 16,916 in 1990 to 178,744 in 2002. However, the 60-day limitation period constrains the efficient use of arbitration, and cases refused by arbitration committees on these grounds end up in court. Accordingly, labor disputes adjudicated by courts have increased from 28,285 in 1995 to 100,923 in 2001. However, rules on court jurisdiction over labor disputes vary from province to province, and courts are generally reluctant to accept labor disputes. See Hualing and Choy (2004).

29 Reforms had actually started in the late 1980s.
A new law on employment contracts, which became effective in January 2008, allows for collective bargaining, but only through trade unions affiliated with ACFTU.\textsuperscript{30} The new labor law has largely been a reaction to reports about worker abuse through nonenforcement of workers’ rights, particularly those of peasant workers, for whom employment contracts are either nonexistent or not enforced. Moreover, the industrial relations system is such that violations are rarely enforced through trade unions or the judicial system.\textsuperscript{31} For instance, correlations have been drawn between the new law and the Shanxi illegal kilns that received much media coverage. Rights violations are usually concerned with deviations from minimum wage and overtime payment norms, as well as nonpayment of social security and perpetuation of casual status.

While a comparative reading of the new 2008 employment law and the Labor Law is irrelevant for purposes of this paper, it is sufficient to mention that differences are primarily on issues like labor contracts, termination, probation, noncompeting clauses, training bonds, unionization, policy manuals, and mass layoffs. Adopted on 1 January 2008, enforcement remains key and, there are legitimate concerns that this tightening up of labor rights, if enforced, will erode PRC’s labor competitiveness.

Labor reforms in rural areas have been quite different. Rural households were granted autonomous decision-making rights by allowing collective and shareholder-based cooperative enterprises, thus enabling diversification from classic agriculture. \textit{Hukou} was also relaxed, allowing rural workers to work in urban enterprises. Moreover, entrepreneurship was encouraged for the first time in rural PRC.

The main labor laws in the rural sector are as follows:

(i) Implementation of the household responsibility system and granting decision-making autonomy to rural residents, begun in 1978 in Xiaogang (Anhui Province), and formally approved by the Communist Party of China in 1982.


\textsuperscript{30} Today, ACFTU is the only national trade union federation. It is divided into 31 regional federations and 10 national industrial unions, such as the All-China Federation of Railway Workers’ Unions and National Committee of the Chinese Seamen and Construction Workers’ Union. It is the largest trade union in the world and has 134 million workers as members through 1,713,000 primary trade union organizations. See International Centre for Trade Union Rights (2005). However, given its thrust, ACFTU only represents urban workers and then only about 54% of them. The International Confederation of Free Trade Unions (ICFTU) has strong reservations about whether ACFTU is truly independent and representative. Therefore, ICFTU encourages all affiliates and global union federations having contact with PRC authorities, including ACFTU, to engage in critical dialogue, including raising violations of fundamental worker and trade union rights in any meetings, especially concerning cases of detention of trade union and labor rights activists (ICFTU 2005).

\textsuperscript{31} There have been several high-profile cases in which the law has clearly been violated. These include PRC-based manufacturers for a high-profile entertainment electronics company and a well-known toy company. ACFTU statistics show that only 20% of 400,000 foreign companies in the PRC have trade unions. Forty percent of the 2 million private enterprises have trade unions (Jing and Xiao 2003). In Guangdong, two prominent fastfood chains were alleged to have violated local minimum wage norms, although the employees were actually students and technically outside the purview of minimum wage regulations.
(iv) Notice on Becoming Urban Residents from Rural Areas (1984) by the State Council. Citizens with rural domicile registration could now migrate to towns and then to cities after complying with registration procedures. Rural–urban migration received a further boost when the food rationing system was abolished in 1992–1993, spurring mingongchao (tidal waves of rural migrant labor) (Wang, Maruyama, and Kikuchi 2000).


Macro View of the People’s Republic of China

Population

Population censuses in the PRC were conducted in 1953, 1964, 1982, 1990, and 2000. In between these census years, 1% population surveys are held. Such a survey was held in 2005, covering 1.3% of the population, and found a 1.72% underestimation of the total population in 2005 (Feng 2006). Some of the reasons behind such an underestimation are directly related to labor market policy.

In urban areas, it is difficult to capture floating populations with temporary residences. Employees of small household businesses often stay in the households, which are then reluctant to report such employees to avoid payment of social security and management fees. Also, families with multiple children underreport births so as not to violate the PRC family planning policy. Therefore, although the PRC’s population was expected to peak at about 1.6 billion in 2050, results of the 2000 census suggest that the population will peak earlier and, therefore, at a smaller value. The peak population is likely to be about 1.45 billion, at some point between 2025 and 2030.

The 2005 1% population survey showed an urban population of 42.99% and a rural population of 57.01% (Feng 2006). However, there are intertemporal comparability problems in urban classifications, because definitions have changed over time. Urban populations are those that live in cities and towns, while rural populations are those that live in counties, excluding populations in counties who live in towns within counties (IIASA 1999). The entire county population is, therefore, not rural, nor is the entire town population urban.

Before 1964, a town was defined as an area that had more than 2,000 permanent residents, as long as 50% or more of the population was engaged in nonagricultural pursuits. In 1964, the definition changed to include two kinds of towns: (i) one with more than 3,000 permanent residents, as long as 70% or more of the population was engaged in nonagricultural pursuits; and (ii) one with between 2,500 and 3,000 residents, as long as 85% or more of the population was engaged in nonagricultural pursuits. In 1984, the definition changed again. An area was a town if (i) it had a county-level government agency; (ii) it had a population less than 20,000, but...
the nonagricultural population was more than 2,000; (iii) it had a population more
than 20,000, but the share of the nonagricultural population to total population was
more than 10%; and (iv) an area was a remote area, a mountainous area, a small
mining area, a small harbor, a tourism area, or a border area where the share of the
nonagricultural population was less than 2,000. Cities are different in that they are
established with the approval of the central government, i.e., the Ministry of Civil
Affairs.

Therefore, an urban definition is contingent on how a nonagricultural population
is defined. Local residence committees decide this in towns, and village committees
decide this in townships, effectively a legacy of the hukou system, with a division
between nongye renkou (agricultural) and fei nongye renkou (nonagricultural) popula-
tions. Not only are these not standardized, but they also vary across the country and
reflect incentives and even corruption, because nonagricultural resident status can
imply benefits like housing, employment, and subsidies to which agricultural popula-
tions are denied access. Such changes in definitions led to a sudden increase in the
PRC’s urban population by nearly 65 million between early 1981 and mid-1982
(Orleans and Burnham 1984).

For various reasons, there has been a statistical element to increased urbanization
in the PRC. Having said this, there are three parts to the employment problem: (i)
with downsizing of SOEs, employment must be created in the urban private sector;
(ii) the issue of a slowdown in rural employment growth must be addressed, although
the surplus component of rural labor is probably far smaller than the commonly cited
figure of 150 million; and (iii) migration raises the issue of both migrant rights and
interregional variations (Brooks and Tao 2003).

**Labor Force**

Census data can be supplemented with employment data, obtained through the labor
force survey or through the establishment survey, in existence since 1957. In the labor
force survey, the employed are defined as those aged 16 and above. In the establish-
ment survey, the employed are defined as those who work in urban units (excluding
private and individual enterprises) and receive wages or other forms of payment. This,
therefore effectively covers public sector employees in urban areas. However, there are
definitional problems with both surveys and mismatches between overall employment
figures and the sum of the individual employment subcategories. In particular, unem-
ployment figures are not satisfactory at all (Cai 2004; Brooks and Tao 2003).

The PRC’s population remains primarily rural (Figure 1), although there are biases
in classifying rural hukou workers. While the rate of population growth has slowed, the
rate of growth in the labor force is higher, explained by an increase in the percentage
of the working age population, leading to the increase in labor force participation
rates. Employment growth has fundamentally been in urban areas, often with rural
hukou workers. Within the urban segment, except for increasing unemployment con-
sequent to SOE restructuring, the distribution of employment has shifted, with both
SOEs and urban collective enterprises dropping, and the share of “other employment”
increasing. This residual category not only includes foreign-owned and foreign-funded
enterprises, but also the informal sector and services. Job losses in SOEs have been
neutralized by job creation in the private sector, with the private sector thriving on the broader thrust of economic reforms.

Significant shifts within rural employment also occurred, with the shares of township and village enterprise employment and private and individual employment increasing. The share of nonagricultural employment in total employment increased from 31.3% in 1980 to 39.9% in 1990 and 50.0% in 2000 (Brooks and Tao 2003). The share of the primary sector declined from 68.7% in 1980 to 50.0% in 2000, while the share of the secondary sector increased from 18.2% to 22.5%, and that of the tertiary sector increased from 13.1% to 27.5%.

PRC’s regional labor market figures also need to be considered. There are significant regional differences in growth of employment. These differences are particularly prominent in the growth of private sector employment in provinces that have special economic zones. The six major clusters, located mostly in the east are (i) Liaodong

---

Table 1: Population, Labor Force, and Employment Indicators in the People’s Republic of China

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population (billion)</td>
<td>0.99</td>
<td>1.14</td>
<td>1.21</td>
<td>1.27</td>
</tr>
<tr>
<td>Urban population (%)</td>
<td>19.4</td>
<td>26.4</td>
<td>29.0</td>
<td>36.2</td>
</tr>
<tr>
<td>Urban population (million)</td>
<td>191.40</td>
<td>301.91</td>
<td>351.74</td>
<td>458.40</td>
</tr>
<tr>
<td>Rural population (million)</td>
<td>795.65</td>
<td>841.42</td>
<td>859.47</td>
<td>807.40</td>
</tr>
<tr>
<td>Working age (15–64 years) population (million)</td>
<td>594.1</td>
<td>763.1</td>
<td>829.0</td>
<td>888.0</td>
</tr>
<tr>
<td>Urban labor force (million)</td>
<td>110.6</td>
<td>174.2</td>
<td>199.0</td>
<td>248.4</td>
</tr>
<tr>
<td>Rural labor force (million)</td>
<td>318.4</td>
<td>477.1</td>
<td>490.2</td>
<td>489.3</td>
</tr>
<tr>
<td>Labor force participation rate (%)</td>
<td>72.2</td>
<td>85.6</td>
<td>82.9</td>
<td>83.3</td>
</tr>
<tr>
<td>Unemployment as % of urban labor force</td>
<td>4.9</td>
<td>3.2</td>
<td>3.4</td>
<td>7.6</td>
</tr>
<tr>
<td>Urban labor force unemployed (%)</td>
<td>1.3</td>
<td>0.6</td>
<td>1.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Urban labor force employed in state-owned enterprises (%)</td>
<td>18.7</td>
<td>15.9</td>
<td>16.3</td>
<td>11.0</td>
</tr>
<tr>
<td>Urban labor force employed in urban collective enterprises (%)</td>
<td>5.7</td>
<td>5.5</td>
<td>4.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Urban labor force in other employment (%)</td>
<td>0.2</td>
<td>4.8</td>
<td>6.7</td>
<td>18.4</td>
</tr>
<tr>
<td>Rural labor force employed in township and village enterprises (%)</td>
<td>7.0</td>
<td>14.2</td>
<td>18.7</td>
<td>17.4</td>
</tr>
<tr>
<td>Rural labor force in private and individual employment (%)</td>
<td>–</td>
<td>2.5</td>
<td>5.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Rural labor force employed as household workers (%)</td>
<td>67.2</td>
<td>56.6</td>
<td>47.3</td>
<td>43.4</td>
</tr>
</tbody>
</table>

– = not applicable.
Peninsula, extending from Shenyang in the north to Dalian in the south and cutting across Anshan, Fushun, Benxi, and Liaoyang; (ii) Beijing–Tianjin–Tangshan, including Tanggu; (iii) Yangtze River Delta (Nanjing–Shanghai–Hangzhou, including Changzhou, Ningbo, Nantong, Suzhou, and Wuzi); (iv) Pearl River Delta, centered on Hong Kong, China, and Guangzhou; (v) Shandong Peninsula (Jinan–Qingdao), including Yantai; and (vi) Fuzhou–Xiamen. Inter-province equity remains a policy issue and unemployment is high in the northeast. Migrant populations are concentrated in the Pearl River Delta and Yangtze River Delta.

Figure 2: Clusters of Growth in the People’s Republic of China

Source: Lo and Yeung 1996.
Table 2: Urban Employment by Province

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>166.2</td>
<td>239.4</td>
<td>61.0</td>
<td>31.9</td>
</tr>
<tr>
<td>North</td>
<td>22.6</td>
<td>21.7</td>
<td>75.2</td>
<td>56.5</td>
</tr>
<tr>
<td>Beijing</td>
<td>4.6</td>
<td>4.6</td>
<td>77.6</td>
<td>53.0</td>
</tr>
<tr>
<td>Tianjin</td>
<td>2.9</td>
<td>2.4</td>
<td>74.9</td>
<td>44.4</td>
</tr>
<tr>
<td>Hebei</td>
<td>6.7</td>
<td>6.6</td>
<td>74.6</td>
<td>61.9</td>
</tr>
<tr>
<td>Shanxi</td>
<td>4.5</td>
<td>4.2</td>
<td>75.7</td>
<td>64.9</td>
</tr>
<tr>
<td>Inner Mongolia</td>
<td>3.9</td>
<td>3.8</td>
<td>73.0</td>
<td>49.6</td>
</tr>
<tr>
<td>Northeast</td>
<td>25.4</td>
<td>19.8</td>
<td>65.0</td>
<td>50.7</td>
</tr>
<tr>
<td>Liaoning</td>
<td>10.8</td>
<td>8.6</td>
<td>62.0</td>
<td>44.5</td>
</tr>
<tr>
<td>Jilin</td>
<td>5.6</td>
<td>4.2</td>
<td>65.2</td>
<td>56.0</td>
</tr>
<tr>
<td>Heilongjiang</td>
<td>9.0</td>
<td>7.1</td>
<td>68.5</td>
<td>54.9</td>
</tr>
<tr>
<td>East</td>
<td>40.1</td>
<td>43.1</td>
<td>65.3</td>
<td>45.0</td>
</tr>
<tr>
<td>Shanghai</td>
<td>5.4</td>
<td>4.4</td>
<td>73.4</td>
<td>42.1</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>9.0</td>
<td>8.8</td>
<td>59.4</td>
<td>44.2</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>5.1</td>
<td>6.0</td>
<td>55.5</td>
<td>30.6</td>
</tr>
<tr>
<td>Anhui</td>
<td>5.2</td>
<td>5.7</td>
<td>63.2</td>
<td>45.6</td>
</tr>
<tr>
<td>Fujian</td>
<td>3.4</td>
<td>4.2</td>
<td>63.9</td>
<td>38.5</td>
</tr>
<tr>
<td>Jiangxi</td>
<td>4.1</td>
<td>3.8</td>
<td>74.0</td>
<td>60.1</td>
</tr>
<tr>
<td>Shandong</td>
<td>7.9</td>
<td>10.2</td>
<td>70.2</td>
<td>52.4</td>
</tr>
<tr>
<td>Central and South</td>
<td>28.6</td>
<td>36.6</td>
<td>82.0</td>
<td>51.0</td>
</tr>
<tr>
<td>Henan</td>
<td>7.3</td>
<td>8.3</td>
<td>71.7</td>
<td>55.1</td>
</tr>
<tr>
<td>Hubei</td>
<td>8.3</td>
<td>6.7</td>
<td>63.3</td>
<td>58.1</td>
</tr>
<tr>
<td>Hunan</td>
<td>–</td>
<td>5.6</td>
<td>–</td>
<td>58.5</td>
</tr>
<tr>
<td>Guangdong</td>
<td>8.5</td>
<td>11.0</td>
<td>61.9</td>
<td>36.2</td>
</tr>
<tr>
<td>Guangxi</td>
<td>3.4</td>
<td>3.8</td>
<td>75.9</td>
<td>59.4</td>
</tr>
<tr>
<td>Hainan</td>
<td>1.1</td>
<td>1.1</td>
<td>83.4</td>
<td>58.2</td>
</tr>
<tr>
<td>Southwest</td>
<td>13.6</td>
<td>15.4</td>
<td>69.4</td>
<td>57.5</td>
</tr>
<tr>
<td>Chongqing</td>
<td>–</td>
<td>2.8</td>
<td>–</td>
<td>49.1</td>
</tr>
<tr>
<td>Sichuan</td>
<td>7.2</td>
<td>6.4</td>
<td>68.9</td>
<td>56.8</td>
</tr>
<tr>
<td>Guizhou</td>
<td>2.5</td>
<td>2.5</td>
<td>74.3</td>
<td>64.0</td>
</tr>
<tr>
<td>Yunnan</td>
<td>3.1</td>
<td>3.5</td>
<td>81.6</td>
<td>60.2</td>
</tr>
<tr>
<td>Tibet</td>
<td>0.9</td>
<td>0.2</td>
<td>17.1</td>
<td>66.7</td>
</tr>
<tr>
<td>Northwest</td>
<td>7.8</td>
<td>11.6</td>
<td>–</td>
<td>61.7</td>
</tr>
</tbody>
</table>

*continued on next page*
Table 2 continued

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaanxi</td>
<td>4.0</td>
<td>4.5</td>
<td>78.6</td>
<td>58.8</td>
</tr>
<tr>
<td>Gansu</td>
<td>2.4</td>
<td>2.5</td>
<td>81.0</td>
<td>66.5</td>
</tr>
<tr>
<td>Qinghai</td>
<td>0.7</td>
<td>0.7</td>
<td>79.8</td>
<td>56.1</td>
</tr>
<tr>
<td>Ningxia</td>
<td>0.7</td>
<td>0.8</td>
<td>80.3</td>
<td>63.1</td>
</tr>
<tr>
<td>Xinjiang Uygur</td>
<td>–</td>
<td>3.2</td>
<td>–</td>
<td>62.8</td>
</tr>
</tbody>
</table>

– = data not available.

Note: The provincial figures do not add up to the overall total, and there is an unexplained residual. The weaknesses in employment data are more severe in some provinces.


Segmentation and Unification

The labor reform and macro overview provide the background against which a unified, homogenous, and flexible labor market in the PRC can be gauged, as well as the cross-country rankings in section 1 and the Labor Law. However, the initial impression may be too simplistic, and several gaps may exist between de jure provisions and de facto implementation.

First, only 35.6% of the labor force in 2005 was in urban areas, although this figure has increased from 25.8% in 1980 (Yao 2007). Within the urban sector, 8.5% was employed in SOEs and 1.1% in urban collective enterprises, leaving 25.0% in a residual “other employment” category. While the “other employment” category raises problems of definitions and measurement, a substantial part of this must be self-employment. Similarly, of the 63.2% of the labor force in rural PRC, only 18.6% was in township and village enterprise employment, 3.1% belonged to the private and individual category, while 41.5% was classified as household workers. Again, a large part of employment must be in the self-employment category. The impression of flexible labor markets and contractual employment with social security provisions is predicated on the existence of an employer–employee relationship, which is true for SOEs, SOE reform, and even for foreign investment, but ignores the existence of the self-employment segment.32 It is not surprising, therefore, that the coverage rate of social security is still low. In 2005, the coverage rate for medical insurance was 36.67%; for pensions, 48.01%; for unemployment insurance, 38.96%; and for work injury insurance, 31.02% (Yao 2007).

Second, a rural and urban dichotomy still remains. Figure 3 shows the evolution of labor rights, divided into employee (effectively urban) rights and peasant (effectively rural) rights, and into de jure (supposed) and de facto (actual) rights. While reforms,

32 Zhejiang Province is the most obvious instance of self-employment and entrepreneurship.
particularly since the mid-1980s, have reduced employee rights and increased peasant rights, not only is there a gap between de jure and de facto, but there is also a continued gap between urban and rural, defined not in terms of residence and workplace but in terms of the *hukou* system.

Third, these gaps in labor rights are not explained in terms of a lack of employer–employee relationships alone or self-employment being higher in the rural sector. Substantial numbers of rural migrants are classified as “rural” from the *hukou* point of view, but are actually employed in urban enterprises, including SOEs. In such instances, the existence of signed contracts is low, and arrears in payment of wages or non-adherence to minimum wage and overtime stipulations are common, thanks to asymmetry of information. In Guangdong, a study found that 50%–80% of employers illegally retained wages (Greenfield and Pringle 2002). Even within the same enterprise and with identical occupation and productivity levels, rural *hukou* workers earn lower wages, are dismissed more easily, sign fewer labor contracts, and obtain lower levels of social security (Yao and Lai 2004). Rural workers are also far less likely to be members of unions. A system of labor contractors does exist, performing an intermediary role for export industries and encouraging casualization. There are human capital differences as well between urban and rural workers; during the transition period of reforms, the rural education and health care systems virtually collapsed.

---

33 For urban workers, although signed labor contracts and union memberships lead to increases in wages and social security coverage, the effect is less perceptible for rural workers. Case law holds that if a worker can prove the existence of a labor relationship in the absence of signed contracts, the Labor Law will still hold. However, in the absence of written contracts, such proof is difficult.

34 This can partly, but not entirely, be explained by differences in human capital formation. Even after controlling for education and skill differences, evidence of discrimination remains.
Conclusions and Implications for Labor Market Reforms in India

Reference has already been made to the tendency in India to equate labor market reforms in the PRC with hire-and-fire provisions and the Industrial Disputes Act. Yet these conclusions, as has been argued, are too simple.

First, in both countries, the employment problem was (and still is) rural. The PRC’s success in ensuring diversification and commercialization of agriculture, creating off-farm employment opportunities, and encouraging entrepreneurship are in sharp contrast to India’s lackadaisical reforms in the rural sector, which have little to do with labor laws that fundamentally characterize the industrial (or manufacturing) sector.

Second, while total factor productivity (TFP) results are not always robust, the better quality of the PRC’s human capital must be acknowledged, as well as its higher female work participation rates. For instance, one TFP estimation, which contrasts India and the PRC in 1989–1995 and 1995–2003, breaks the capital component down into information and communications technology (ICT) and non-ICT components, while the labor input is broken down into quantity (hours) and quality (Jorgenson and Vu 2005). In both periods, the PRC’s growth is more capital-intensive, while within the labor component, growth in India is driven more by quantity than by quality. On this note, only 16% of manufacturing firms in India offer in-service training, compared with 92% in the PRC (Dutz 2007).

Third, India’s success in reforming public sector enterprises has also been more limited than that of the PRC. There are dangers in equating the successes of SOE reform with contractual labor provisions alone, although these contractual provisions have also applied to foreign-owned and foreign-invested enterprises, unlike in India, which adhered to national treatment. Fourth, the PRC’s success in manufacturing exports offers a useful contrast with India’s apparent failure, although this perception may have changed since 2005. It would be too easy to ascribe this to rigid provisions in firing labor alone, ignoring elements like infrastructure, skill formation, economies of scale, and investments in technology. For instance, one report estimated that compared to other constraints, inflexible labor laws and poor infrastructure only lead to 0.5% loss in GDP growth in India (McKinsey Global Institute 2001).

Fifth, more than the statutory provisions in Chapter V-B of Industrial Disputes Act, procedural and compliance costs associated with administrative labor law are more of a problem. However, there will probably be consensus that the PRC has been the most successful in reducing procedural costs. Sixth, as the discussion in earlier sections of this paper illustrates, exploitation of the labor cost advantage in the PRC has not been based on de jure implementation of the Labor Law, but on de facto deviations from its provisions, through the hukou system applied to rural migrants. In India’s context, one looks at labor laws that apply to the organized sector, forgetting absence of rights in the unorganized sector. Since labor laws in India do not apply—or are not enforced in—the unorganized sector, the question remains as to why India has not been able to reap such a benefit, and the answer probably lies in the lack of physical infrastructure and absence of human capital skills. Indeed, one could argue that the

---

35 Across the two periods, there is TFP deceleration in the PRC and acceleration in India.
36 These are survey-based figures.
37 Plus some sectors are reserved for production by the small-scale sector.
increase in employment between 1999–2000 and 2004–2005 is precisely because this phenomenon has now begun to be felt in India.

In the PRC, India, and several developing countries, a substantial part of employment is in the informal sector, which should not be confused with the illegal sector. An International Labour Organization (ILO) study found that 50%–75% of nonagricultural employment in the developing world is informal (2002), which includes both self-employment in informal (small and unregistered) enterprises and wage employment in informal jobs (without labor contracts, worker benefits, and protection). Subject to data problems, 83% of India’s nonagricultural employment was estimated to be informal, and self-employment constituted 52% of nonagricultural informal employment. The PRC was not included in the ILO estimations, but the nature, if not the scale, of the problem is bound to be similar.\(^{38}\)

The informal employment continuum has different categories. Workers employed on a casual basis will be better placed than workers to whom manufacturing work is outsourced, but they will still be inferiorly placed, compared to workers who have a more regular status. Cross-country, there is a correlation between the size of the informal economy and poverty, or levels of economic development (Figure 4). The challenge for developmental policy is thus one of integrating and mainstreaming the informal sector into the formal economy. This is a broad issue, and there can be several reasons behind informality—avoidance of taxes and complicated transaction costs associated with registration, spliced with relatively few perceived benefits consequent to formalization.

\(^{38}\) Some figures from the Organisation for Economic Co-operation and Development (OECD) suggest that informal employment is between 13.0% and 13.5% of total employment in the PRC (Marianna 2007).
However, there is also a labor market angle to the informality question, since informality may be deliberately used to exploit a country’s labor cost advantage. For instance, some elements of self-employment in developing countries may actually be wage employment, except that it is disguised through outsourcing. This reduces not only non-wage labor costs such as social security, but also non-labor costs such as rentals, materials, equipment, and even transport. Most labor laws were designed in the West in the aftermath of the Industrial Revolution, and are thus predicated on a notion of factories and the existence of an employer–employee relationship. A forcible application of these, as happened in India, fails to recognize the actual nature of employment relationships. Such attempts are also likely to lead to violation and non-enforcement.

On the other hand, there can be legitimate concerns about exploitation and workers being denied their rights because core labor standards are ignored. While this is a valid point, there can be no unanimity—regardless of the level of economic development—about what a “core” labor standard is. For instance, article 24 of the Universal Declaration of Human Rights states, “Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay” (United Nations General Assembly 1948), which cannot be applied indiscriminately to developing countries. Minimum wages, working hours, overtime, occupational health and safety, nondiscrimination, protection against unfair dismissal, right to collective bargaining, and restrictions on use of child labor are rights that must be treated differently than paid holidays. Issues of mobility and legal recognition of workers are also important, because workers often have no legal identities, which are prerequisites for exercising all rights.

Thus, there is an inevitable trade-off between protecting rights and ensuring labor cost competitiveness. As economic development occurs, a higher premium is attached to rights. Yet this change in premium must be based on what is happening internally within the country and not because of external pressure from trading partners, with labor standards built into trade policy formulation. While there are individual differences, the labor markets in the PRC and India have certain similarities based on segmentation. Within the organized sector, India’s labor market has become unnecessarily rigid, increasing especially in the late 1970s to mid-1980s. While organized labor market in the PRC was also originally rigid, it has became increasingly flexible since the mid-1980s, a lesson for India. In both countries, the unorganized market remained flexible, with workers denied rights that would be regarded as core rights in most developed countries. The PRC’s attempt to revise its Labor Law in 2008 can be interpreted as a higher premium that is now attached to core labor rights.39

39 This naturally implies an increase in average labor costs.
References


China Population Development and Research Center. www.cpirc.org.cn


International Labour Organization (ILO). www.iolo.org


An Overview of India’s Growth and Development

Dashu Wang

India has become an increasingly important actor on the global economic stage. Its growth has been vigorous and its macroeconomic fundamentals are strong. By 2005, it had become the world’s fifth largest economy, after the United States (US), the People’s Republic of China (PRC), Japan, and Germany, with a 4.26% share of global gross domestic product (GDP) when measured by purchasing power parity. In 2006, India accounted for 1.0% and 1.4% of the world’s exports and imports, respectively, ranking 28th and 17th in these two categories. India’s combined share in these categories was 1.2%. This rising economic prominence is not expected to be a passing phenomenon. Goldman Sachs, for example, has identified India as one of the so-called BRIC nations—along with Brazil, the Russian Federation, and the PRC. It expects these four large emerging market countries to continue growing rapidly for the next 30 years.

The reasons for India’s stellar economic performance have been the subject of considerable study, analysis, and writing, both within the country and internationally. Published reviews often discuss causal factors—although typically without formal econometric modeling—but the role played by economic reforms in greater growth is often a matter of controversy. Other publications have used econometric techniques to identify structural breaks in the growth process but have not employed causal modeling (e.g., Wallack 2003). This paper will describe India’s recent rapid and sustained economic growth, examine some of its unique features, and analyze the causes underlying the country’s success.

1 Professor at Peking University in the PRC (e-mail: dwang@pku.edu.cn). Special thanks is given to Shankar Acharya, chief economic adviser to the Government of India in 1993–2000; Jayanta Roy, economic adviser to the Government of India in 1990–1991; and Alok Sheel, secretary of the Economic Advisory Council to the Prime Minister, for their comments.

2 At market exchange rates, India’s GDP share initially fell from 1.7% during 1982–1985 to 1.1% in 1993 before rising to 1.8% in 2006. India ranked 13th in the world.

3 Goldman Sachs is one of the most influential financial institutions in the world. The term “BRIC” was coined by its head of global economic research, Jim O’Neill (2001).

India’s Growth and Development

The pattern of rising economic growth in India since its independence from the United Kingdom forms three plateaus, each demonstrating a marked increase in the rate of economic expansion on the one that came before, as illustrated in Table 1.

Table 1: Growth of Gross Domestic Product (% per year)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>3.6</td>
<td>5.7</td>
<td>7.6</td>
</tr>
</tbody>
</table>

Source: Central Statistical Organisation, Government of India, various issues.

The First Plateau

For the first 30 years after its independence (1947–1980), India’s economy grew at a lackluster pace, averaging a modest 3.6% annually. Per capita GDP growth was only 1.4%. Although this performance—which Raj Krishna, an Indian economist, described as the “Hindu rate of growth”—represented a dramatic increase over the colonial past, it was far below the country’s potential and much less than the 7%–8% rates being achieved at the time by the so-called four Asian tigers (Hong Kong, China; the Republic of Korea; Singapore; and Taipei, China). Compounding this shortcoming was the proportion of India’s population living below the poverty line—it actually increased during this period, from 45% to 51% (Table 2).

Table 2: India’s Population Below Poverty Line (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Rural</th>
<th>Urban</th>
<th>All India</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951–1952</td>
<td>47.4</td>
<td>35.5</td>
<td>45.3</td>
</tr>
<tr>
<td>1977–1978</td>
<td>53.1</td>
<td>45.2</td>
<td>51.3</td>
</tr>
<tr>
<td>1983</td>
<td>45.7</td>
<td>40.8</td>
<td>44.5</td>
</tr>
<tr>
<td>1993–1994</td>
<td>37.3</td>
<td>32.4</td>
<td>36.0</td>
</tr>
<tr>
<td>1999–2000</td>
<td>26.8</td>
<td>24.1</td>
<td>26.1</td>
</tr>
</tbody>
</table>

Source: Planning Commission, Government of India.

The Second Plateau

India’s growth accelerated in the 1980s to an annual rate of 5.7%, with per capita growth reaching 3.4%. Contributing factors included early efforts at industrial and trade liberalization and tax reform, stepped-up public investment, better agricultural performance, and an expansionist fiscal policy (Acharya 2007). Fiscal controls weakened during this period, public spending increased, and—as a result—the budget deficits rose from 6.4% to 9.0% as a proportion of GDP. The mounting deficits spilled over to the external sector, thus requiring an increase in external borrowings on commercial terms. As the export–GDP ratio worsened, a serious balance of payments (BOP) imbalance triggered a severe economic crisis.
The liquidity crisis and mounting fiscal deficits prompted the Government of India—then led by the Congress Party, with Manmohan Singh as finance minister—to undertake emergency measures in 1991 to restore confidence in the economy. By launching a package of “long overdue and wide-ranging” economic reforms (Acharya 2007), the government converted its challenge into an opportunity. As noted by Ahluwalia (2002), these reforms were more “gradualist” than “medium bang.” They fell into two broad categories: stabilization and structural. The former was aimed at addressing internal and external imbalances in the economy; the latter sought to remove rigidities and inefficiencies that had developed in various segments. It was argued that the overall effect of these reforms would be to release powerful growth impulses and to lift the economy to a high growth trajectory. As expected, the economy did respond positively. After virtual stagnation in 1991–1992, GDP grew during the subsequent 5 years at a record average annual rate of 6.7%.

However, growth slowed to 5.5% during the Ninth Five Year Plan (1997–2002), due mainly to five factors. Fiscal deficits worsened, with an associated decline in public savings. Reforms slackened after 1995, as coalition governments became the norm. Agricultural performance was poor, the industrial cycle experienced a marked downswing, and the international economic environment was unsupportive (Acharya 2007).

The Third Plateau

As the effects of the reforms of the 1990s have worked through the economic system, India appears to have graduated to a higher growth path. The pace accelerated in 2003 and has exceeded 8.0% of GDP in every year since. Real GDP growth was 9.4% in 2006/07, reflecting buoyancy in manufacturing activity and an impressive performance in services. It was the fourth consecutive record year for India’s economic growth, which averaged 8.6% per year during 2003/04 to 2006/07. The observed growth of 7.6% in the Tenth Five Year Plan (2002–2007) is the highest so far for any plan period.

The key driver in this impressive economic expansion has been the services sector, which is dominated by software and other business services. Net surplus under services expanded from $23.9 billion in 2005/06 to $32.7 billion in 2006/07, led by an increase of 29.4% in net surplus under software services to $28.8 billion. In the Tenth Five Year Plan, industries grew at an average of 8.1%, due mainly to a sharp acceleration in manufacturing growth to 8.6% from 3.3% under the previous plan. Manufacturing’s contribution to overall growth rose from 9.6% to 17.7% (Ministry of Finance [MOF] 2008).

The resurgence in both industry and services was reflected in the significantly improved financial performance of the private corporate sector. During this plateau, it has also been made clear that India’s macroeconomic fundamentals are solid.

---

5 For example, the process of removing import restrictions, which began in 1991, has been completed in a phased manner, with the removal of restrictions on 715 items (Exim Policy 2001–2002).
6 There is emerging literature on India’s reforms and the consequent performance of its economy. See, for example, Nayyar (2006), Ahluwalia (2002), Kelkar (2004), Kochhar et al. (2006), Panagariya (2006), and Acharya (2002, 2007).
7 This latest economic surge has raised the issue of whether India’s growth rate trend has accelerated to 8% (or higher) from its previous level of around 6%.
Tangible progress has been made toward fiscal consolidation, and a good BOP position continued in 2006/07 to reflect sustained strength and vibrancy of the external sector. Merchandise exports and nonoil import growth were healthy.

Foreign investment inflows, comprising foreign direct investment (FDI) and foreign portfolio investment, have risen since the 1990s due to a positive investment climate, improved growth prospects, and initiatives aimed at rationalizing and liberalizing the FDI policy and at simplifying procedures. The rising pace of mergers and acquisitions in sectors like financial services, manufacturing, banking services, information technology (IT), and construction boosted these inflows. With capital inflows continuing to exceed the current account deficit, the BOP recorded another significant surplus in 2006/07.

This growth is clearly benefiting much of India’s population. Per capita income almost doubled between 2003/04 and 2007/08, rising at an annual average of 7.2%. Such rates indicate that average income will double in a decade (MOF 2008). As a comparison, the growth rate of per capita income averaged 3.1% during the 12 years from 1980/81 to 1991/92, accelerating marginally to 3.7% per year during the next 11 years, from 1992/93 to 2002/03 (MOF 2008). Per capita consumption has also increased at steadily faster rates, growing an average of 2.2% per year during the 12 years from 1980/81 to 1991/92. In the 11 years after the reforms of the 1990s, the rate jumped to 2.6% per year. It almost doubled during the subsequent 5 years from 2003/04 to 2007/08, to 5.1% annually (MOF 2008).

This growth is also associated with an important reduction in poverty. Based on data from the National Sample Survey Organization’s 61st large-scale sample survey on household consumer expenditure for 2004/05, it may be concluded that the incidence of poverty declined to about 22% in 2004/05 from 26% in 1999/00 in terms of the mixed recall period (MOF 2008).

**Features of India’s Economic Growth**

**Information Technology**

IT is the leading sector in India’s rapidly growing economy and the single most potent locomotive of India’s growth. The country’s surging economic expansion began in the IT sector, where growth has continued without interruption in the last decade. In addition, the sector’s share in GDP has steadily risen. Apart from providing inputs, the IT sector contributes to the outward shift of other sectors’ production frontiers by enhancing productivity growth. As argued by Jorgenson (2001) in a comprehensive analysis, IT has significantly contributed to total factor productivity growth in the US. This is also true in India.

There are two conductive mechanisms by which the IT sector has led India’s economy to a trajectory of rapid and sustained growth. The first is through exports:

\[
\text{IT} \uparrow \Rightarrow \text{Export and Profits} \uparrow \Rightarrow \text{Savings} \uparrow \Rightarrow \text{Investment} \uparrow \Rightarrow \text{Industries} \uparrow
\]

The second is through spillovers:

\[
\text{IT} \uparrow \Rightarrow \text{IT-Enabled Services ITESs} \uparrow \Rightarrow \text{Services} \uparrow \Rightarrow \text{Manufacturing Industries} \uparrow
\]
The Importance of the Information Technology Sector

The IT sector has also been the biggest beneficiary of India’s economy opening up, as strong demand over the past few years has made India one of the fastest-growing IT markets in the world. The sector’s share of GDP rose from 0.7% in 1994/95 to 4.8% in 2005/06, reaching 5.2% in 2006/07.

Table 3: Performance of India’s Information Technology Sector

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Revenue ($ billion)</th>
<th>% of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997/98</td>
<td>4.8</td>
<td>1.2</td>
</tr>
<tr>
<td>1998/99</td>
<td>6.0</td>
<td>1.5</td>
</tr>
<tr>
<td>1999/00</td>
<td>8.2</td>
<td>1.9</td>
</tr>
<tr>
<td>2000/01</td>
<td>12.1</td>
<td>2.7</td>
</tr>
<tr>
<td>2001/02</td>
<td>13.4</td>
<td>2.9</td>
</tr>
<tr>
<td>2002/03</td>
<td>16.1</td>
<td>3.2</td>
</tr>
<tr>
<td>2003/04</td>
<td>21.6</td>
<td>3.5</td>
</tr>
<tr>
<td>2004/05</td>
<td>28.4</td>
<td>4.1</td>
</tr>
<tr>
<td>2005/06</td>
<td>36.3</td>
<td>4.8</td>
</tr>
</tbody>
</table>

GDP = gross domestic product.

Note: Information technology industry includes hardware, software, and related business service industry.


Contribution from Information Technology to Exports

Software and business services—mostly IT-enabled services (ITESs)—dominate India’s services exports and are the areas in which India’s exports have established a substantial, growing international presence. These expanding exports have kept India’s current account deficit relatively small despite a large increase in the country’s merchandise trade deficit. Software makes up a major portion of IT revenues and was the fastest-growing export in 2002/03–2006/07, with a share of total services exports remaining above 38%. In 2006–2007, software exports reached $31.3 billion, accounting for 38.5% of the total.

Growth in non-software business services, which are included in the miscellaneous category, is also robust, driven by trade-related services, business and management consultancy services, architectural and engineering services, other technical services, and office maintenance services.

IT and ITES exports not only enable India to earn much-needed foreign exchange and to generate large profits, they also help improve the lives of many Indians. The sector is profitable, and salaries are rising. These increases become domestic savings, which contribute to the expansion of consumption and investment in India. In fact, Acharya (2007) noticed “a growing middle class” and its contribution to consumption. Inevitably, members of this middle class are somehow connected to IT and ITESs.
Table 4: Computer and Information Technology Exports ($ billion)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>2000</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>India</td>
<td>6.3</td>
<td>12.8</td>
<td>17.7</td>
<td>23.6</td>
</tr>
<tr>
<td>2</td>
<td>Ireland</td>
<td>7.5</td>
<td>14.2</td>
<td>18.8</td>
<td>18.7</td>
</tr>
<tr>
<td>3</td>
<td>United Kingdom</td>
<td>4.3</td>
<td>8.2</td>
<td>11.7</td>
<td>10.6</td>
</tr>
<tr>
<td>4</td>
<td>Germany</td>
<td>3.8</td>
<td>6.7</td>
<td>8.0</td>
<td>8.1</td>
</tr>
<tr>
<td>5</td>
<td>United States</td>
<td>5.6</td>
<td>6.3</td>
<td>6.8</td>
<td>6.0</td>
</tr>
<tr>
<td>6</td>
<td>Israel</td>
<td>4.2</td>
<td>3.7</td>
<td>4.4</td>
<td>4.5</td>
</tr>
<tr>
<td>7</td>
<td>Netherlands</td>
<td>1.2</td>
<td>2.9</td>
<td>3.7</td>
<td>3.6</td>
</tr>
<tr>
<td>8</td>
<td>Spain</td>
<td>2.0</td>
<td>2.9</td>
<td>3.0</td>
<td>3.6</td>
</tr>
<tr>
<td>9</td>
<td>Canada</td>
<td>2.4</td>
<td>2.8</td>
<td>3.1</td>
<td>3.4</td>
</tr>
<tr>
<td>10</td>
<td>Belgium</td>
<td>–</td>
<td>2.1</td>
<td>2.4</td>
<td>2.6</td>
</tr>
</tbody>
</table>

– = not available.

For 2005.

Sources: International Monetary Fund 2006; Reserve Bank of India 2007.

Table 5: Structure of India’s Services Exports

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount ($ million)</th>
<th>Share in Total Services Exports (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Travel</td>
</tr>
<tr>
<td>1970/71</td>
<td>292</td>
<td>16.8</td>
</tr>
<tr>
<td>1980/81</td>
<td>2,804</td>
<td>43.5</td>
</tr>
<tr>
<td>1990/91</td>
<td>4,551</td>
<td>32.0</td>
</tr>
<tr>
<td>2000/01</td>
<td>16,268</td>
<td>21.5</td>
</tr>
<tr>
<td>2003/04</td>
<td>26,868</td>
<td>18.7</td>
</tr>
<tr>
<td>2004/05</td>
<td>43,249</td>
<td>15.4</td>
</tr>
<tr>
<td>2005/06</td>
<td>61,404</td>
<td>12.8</td>
</tr>
<tr>
<td>2006/07</td>
<td>81,330</td>
<td>11.6</td>
</tr>
</tbody>
</table>

– = data not available, GNIE = government not included elsewhere.

a Excluding software services.

Source: Reserve Bank of India 2007.

Spillover from Information Technology

IT has expanded throughout India’s economy, providing spillover benefits to other industries and contributing to other sectors through its vertical and horizontal links. In fact, the revolution in information and communication technology has imparted tradability to services that were once considered untradeable—but are now known as ITESs.8

8 These are principally business-processing services and activities associated with the writing, testing, and debugging of software.
Bhagwati (1984) was an early observer of the trend toward removal of proximity requirements through technological change—i.e., the increased richness and lower cost of long-distance communications. Melvin (1989) explored this trend, characterizing services either as activities that require the double coincidence of time and location, or as activities that overcome constraints of time (e.g., storage services) and location (e.g., transport services). Accordingly, knowledge-based services, which have traditionally been personal services, are now becoming more industrialized through the network industry. The ability to digitally encode all kinds of information, whether voice, data, or video, makes it possible to send information over a network with digital capabilities. Additionally, with the advent of the IT revolution, it has become possible to deliver services over long distances at a reasonable cost—and India has been a particular beneficiary of this tendency. There is no doubt that there have been positive reputational and resource spillovers from India’s software export sector to ITESs. Furthermore, empirical research (Banerjee and Duflo 2000) shows that reputation effects are crucial for India’s software exporters.

In some cases, services can be unbundled to allow the offshore outsourcing of lower-skill components, such as the software testing component of software development. Outsourcing separates service activities into components that can then be performed by different organizations, often offshore. According to the National Association of Software and Services Companies, India’s share of the world’s total outsourcing market is about 12%. In addition to software testing, other services outsourced to India include medical transcription and basic reading of x-rays as components of health care, checking for routine arithmetic or other errors as part of tax preparation, and basic calculations in financial planning advice. Outsourcing provides economies of scale and specialization and the use of lower-cost locations offshore. In 1999/00, more than 185 of the Fortune 500 companies outsourced their software requirements to India (Bajpai 2002).

Encouragingly, Indian companies have started moving up the value chain by exploring untapped potential in IT consulting and system integration, hardware support and installation, and processing services. India has achieved a breakthrough in the export of business process services and software, whose tradability has been greatly enhanced by advances in telecommunications and the advent of the internet. India ranks first in the world in exports of computer and information services (Table 4).

The improvements in operational efficiency that IT can provide create strong complementarities between the IT sector and economic activities such as accounting, procurement, inventory management, and production operations. These are examples of what are also known as forwarded spillover or forward links. The effect of the IT sector in providing technical education is an example of a backward link. In either case, complementarity is at work.

The forwarded spillovers from ITESs also benefit India’s financial sector, where IT is used to upgrade services, establish institutions and practices for reducing paperwork.

---

9 See Kapur and Ramamurti (2001) for a more detailed argument, including the role of Indians with experience of working in Silicon Valley and other global IT centers.

10 Exports of not just software and services but also of goods have benefited (Clarke and Wallsten 2006).

11 Evidence of some forward links in the informal IT sector is provided by Kumar (2000).
and delays, and improve clearing and settlement procedures. IT also allowed the development of an online trading system for the stock market, which improved its operational efficiency, informational efficiency, depth, and liquidity. Moreover, IT improvements in the efficiency of India’s stock market may benefit a small section of the population, although the indirect benefits of greater capital market efficiency may be broader. As an example, the use of IT in rural banking and microfinance can benefit much more of the population.

Table 6: India’s Information Technology Sector

<table>
<thead>
<tr>
<th>Item</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07 a</th>
</tr>
</thead>
<tbody>
<tr>
<td>(in $ billion)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Total software and services revenues</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>12.9</td>
<td>17.7</td>
<td>23.6</td>
<td>31.3</td>
</tr>
<tr>
<td>Domestic</td>
<td>3.8</td>
<td>4.9</td>
<td>6.7</td>
<td>8.4</td>
</tr>
<tr>
<td>(i) IT services</td>
<td>10.4</td>
<td>13.5</td>
<td>17.8</td>
<td>23.6</td>
</tr>
<tr>
<td>Exports</td>
<td>7.3</td>
<td>10.0</td>
<td>13.3</td>
<td>17.8</td>
</tr>
<tr>
<td>Domestic</td>
<td>3.1</td>
<td>3.5</td>
<td>4.5</td>
<td>5.5</td>
</tr>
<tr>
<td>(ii) ITESs–BPO</td>
<td>3.4</td>
<td>5.2</td>
<td>7.2</td>
<td>9.5</td>
</tr>
<tr>
<td>Exports</td>
<td>3.1</td>
<td>4.6</td>
<td>6.3</td>
<td>8.4</td>
</tr>
<tr>
<td>Domestic</td>
<td>0.3</td>
<td>0.6</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>(iii) Engineering services and R&amp;D, software products</td>
<td>2.9</td>
<td>3.9</td>
<td>5.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Exports</td>
<td>2.5</td>
<td>3.1</td>
<td>4.0</td>
<td>4.9</td>
</tr>
<tr>
<td>Domestic</td>
<td>0.4</td>
<td>0.8</td>
<td>1.3</td>
<td>1.6</td>
</tr>
<tr>
<td>2. Hardware</td>
<td>5.0</td>
<td>5.6</td>
<td>7.1</td>
<td>8.5</td>
</tr>
<tr>
<td>3. Total IT industry (1+2)</td>
<td>21.6</td>
<td>28.1</td>
<td>37.4</td>
<td>47.8</td>
</tr>
<tr>
<td>As % of GDP</td>
<td>3.5</td>
<td>4.1</td>
<td>4.8</td>
<td>5.2</td>
</tr>
<tr>
<td>(in ‘000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Total Employment b</td>
<td>830</td>
<td>1,058</td>
<td>1,293</td>
<td>1,630</td>
</tr>
<tr>
<td>(i) IT services</td>
<td>215</td>
<td>297</td>
<td>398</td>
<td>562</td>
</tr>
<tr>
<td>(ii) ITESs–BPO</td>
<td>216</td>
<td>316</td>
<td>415</td>
<td>545</td>
</tr>
<tr>
<td>(iii) Engineering services and R&amp;D, software products</td>
<td>81</td>
<td>93</td>
<td>115</td>
<td>144</td>
</tr>
<tr>
<td>5. Domestic market</td>
<td>318</td>
<td>352</td>
<td>365</td>
<td>378</td>
</tr>
<tr>
<td>(Including user organization)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GDP = gross domestic product, IT = information technology, ITESs–BPO = information technology-enabled services–business process outsourcing, R&D = research and development.

a Estimates.

b Excluding hardware.

Employment Generation by Information Technology

IT and ITESs have created many jobs for Indians. The number of professionals employed in this sector grew from an estimated 830,000 in 2003/04 to 1,630,000 in 2006/07 (Table 6). Direct employment in the industry has grown at a compounded annual rate of 26% in the last decade, making it the largest employer in India’s organized private sector (Ministry of Communication and Information Technology [MCIT] 2008). Another 8 million people were estimated to be indirectly employed by the sector in 2007–2008, mostly in new jobs. The sector is also estimated to have helped create an additional 3 million jobs through indirect and induced employment in telecommunications, power, construction, facility management, IT transport, catering, and other services (MOF 2007). It is estimated that every job directly created by the sector generates four additional indirect jobs.12

Service-Dominated Growth

India’s recent economic development has been called “services-led industrialization” or even a “services revolution” (Gordon and Gupta 2004). The services industry is regarded the “mainstay of the economy” by the Reserve Bank of India (RBI) (2007) and “the key driver of growth” by the Economic Advisory Council to the Prime Minister (2007). It accounted for 52.3% of GDP in 2007/08 and continued to increase its share of the economy.13 Expanding tourism, improvements in telecommunications, broad success in IT and business-process outsourcing, accelerating deposit and credit growth, and the opening up of the insurance sector have not only buoyed the services industry but have also made the overall economy more resilient, particularly in times of adverse agricultural shocks and industrial slowdown. In fact, the services sector’s role in India’s expansion has sometimes been extraordinarily dominant—in 2002/03, its relative contribution to real GDP growth reached 97.7%. Indeed, overall growth in 1997–2002 would have been even weaker but for the unexpected strength of services growth, an average of 8.2%, while industry managed only 4.4%.

As such, other segments of the services sector have also begun to grow rapidly. In a remarkable transition, for example, tourism has registered double-digit growth rates in each of the last 4 years, and has stimulated demand for hotels, restaurants, and handicrafts. Tourism has great potential in India, given the country’s enormous natural, human, and technological resources. Its biodiversity and wide variety of unique attractions could allow India to transform itself into a year-round destination, with increased emphasis on new products like medical tourism, rural tourism, and wellness tourism.

12 Indirect employment includes expenditure on vendors, including telecommunications, power, construction, facility management, IT, transport, catering, and other services.

13 Nevertheless, it should be recognized that this unusual phenomenon is puzzling, which is recorded in official data on output and productivity of traditional services, such as wholesale and retail trade, road transport, railways, community services, etc. For example, Acharya (2002) questioned both the quality of the data and the durability of such sharply divergent growth rates of industry and services.
Table 7: Exports of Services, 2004

<table>
<thead>
<tr>
<th>Country</th>
<th>Exports ($ billion)</th>
<th>Share in World Exports (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>340</td>
<td>15.2</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>181</td>
<td>8.1</td>
</tr>
<tr>
<td>Germany</td>
<td>142</td>
<td>6.3</td>
</tr>
<tr>
<td>France</td>
<td>110</td>
<td>4.9</td>
</tr>
<tr>
<td>Japan</td>
<td>98</td>
<td>4.4</td>
</tr>
<tr>
<td>Spain</td>
<td>85</td>
<td>3.8</td>
</tr>
<tr>
<td>Italy</td>
<td>84</td>
<td>3.7</td>
</tr>
<tr>
<td>Netherlands</td>
<td>73</td>
<td>3.3</td>
</tr>
<tr>
<td>People’s Republic of China</td>
<td>62</td>
<td>2.8</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>54</td>
<td>2.4</td>
</tr>
<tr>
<td>Belgium</td>
<td>52</td>
<td>2.3</td>
</tr>
<tr>
<td>Ireland</td>
<td>52</td>
<td>2.3</td>
</tr>
<tr>
<td>Austria</td>
<td>49</td>
<td>2.2</td>
</tr>
<tr>
<td>Canada</td>
<td>48</td>
<td>2.1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>43</td>
<td>1.9</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>41</td>
<td>1.9</td>
</tr>
<tr>
<td>Singapore</td>
<td>41</td>
<td>1.8</td>
</tr>
<tr>
<td>India</td>
<td>40</td>
<td>1.8</td>
</tr>
<tr>
<td>Sweden</td>
<td>39</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Source: International Monetary Fund 2005; Reserve Bank of India 2007.

As the services sector’s export successes show, India’s ITESs and business-process outsourcing have demonstrated competitiveness and sustained cost advantage. India’s share of global services exports more than tripled from 0.6% in 1995 to 2.2% in 2005. By comparison, India’s share of global merchandise exports was only 1.0% in 2005, and it ranked a relatively low 29th in the world; its comparative share and ranking in commercial services exports were 2.3% and 11th, respectively. Services exports have not only grown faster than goods exports but have provided stability to current receipts.

An Unconventional Pattern of Growth

Economics suggests that development is a three-stage process. First, a country has an economy dominated by agriculture. Next, growth accelerates, accompanied by an increase in the industrial share. Third, the services share grows more rapidly, accompanied by a stagnant or declining share for industry. Experience in many countries indicates that the second stage lasts until a nation reaches lower middle-income status, while the third stage usually begins when it moves into the upper middle-income ranks. The dominance of the services industry is associated with the third stage of growth. This is Petty-Clark’s Law. History also suggests that the dominance of the services industry is unlikely to be sustained without strong industrial growth.
India’s experience appears to negate this hypothesis, however. India has moved rapidly and directly from agriculture-dominated growth to service-dominated growth—bypassing the industry-dominated stage. This raises questions about the nature and pattern of India’s development and whether it can be sustained or replicated.

The PRC, for example, has followed Petty-Clark’s Law. The decline in the country’s agricultural share from 17.5% in 1990 to 6.7% in 2006 was completely absorbed by a rise in the share of secondary industry from 52.6% to 65.6%. Meanwhile, the share of services remained about the same, at 28%–29%. India’s pattern, on the other hand, is atypical. The decline in the agricultural share from 51.3% in the early 1950’s to 18.1% in 2007/08 has been picked up by services, whose share rose from 33.5% to 52.3% during the same period. It was industry’s share that remained broadly unchanged in India for almost 3 decades (Table 8).

### Table 8: Sector Share in Real Gross Domestic Product (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>51.3</td>
<td>41.8</td>
<td>41.2</td>
<td>34.4</td>
<td>29.3</td>
<td>22.4</td>
<td>19.1</td>
<td>18.1</td>
</tr>
<tr>
<td>Industry</td>
<td>14.8</td>
<td>20.3</td>
<td>21.3</td>
<td>25.3</td>
<td>26.4</td>
<td>27.0</td>
<td>28.7</td>
<td>29.5</td>
</tr>
<tr>
<td>Services</td>
<td>33.5</td>
<td>38.2</td>
<td>37.4</td>
<td>40.3</td>
<td>44.4</td>
<td>50.6</td>
<td>52.2</td>
<td>52.3</td>
</tr>
</tbody>
</table>

Source: Central Statistical Organisation, Government of India, various years.
India’s services sector passed a milestone in 1997 when its share of GDP rose above the 50% mark. Since then, growth in tertiary industry has accelerated, with an average annual increase of more than 1%. The sector composition of output in India has come to resemble that of a middle-income country, even though it remains a low-income country by the usual measures. In 2006/07, India’s services sector share was 53.4%, among the highest in developing world (Figure 2).

**Unbalanced Growth**

At the macro level, India’s economic growth, however, has been selective and unbalanced. The agricultural and infrastructure sectors face problems, and poverty reduction is slow. These factors present constraints to growth.

**Agriculture**

Agriculture and allied sectors have long been areas of concern in India, with growth both low and volatile. Farm output is greatly influenced by weather-induced fluctuations. Moreover, agricultural production has decelerated and has been characterized by stagnation in the output of major food grains. The Tenth Five Year Plan targeted growth in agriculture at 4% per year to reverse this trend. Actual growth during the period averaged only 2.3%, however, compared with 3.2% during the 1990s and 4.4% during the 1980s. The many reasons for this poor performance include the lack of a long-term policy perspective, declining public investment, weak credit delivery, inadequate rural road networks, grossly inadequate maintenance of irrigation assets, soil damage from inappropriate and over use of chemical fertilizers, low seed replacement rates, an inadequate incentive system, and low post-harvest value addition.

Although agriculture’s share of GDP dropped from 34.4% in 1980/81–1982/83 to 18% in 2007/08, the proportion of India’s population that depends on the sector has hardly declined. Agricultural expansion barely outpaces population growth, in
**An Overview of India’s Growth and Development**

stark contrast to the brisk growth in tertiary and secondary industries. Nearly 60% of its people and the majority of the poor derive their livelihoods in whole or in part from the farm sector. Therefore, the implications of agriculture's lackluster performance for poverty reduction and inclusive economic growth in India are serious. Accordingly, in states where agriculture has made spectacular progress, poverty levels have decreased (Kapila 2007b). There is now a widespread consensus that for India's economy to maintain its growth momentum on a sustained basis, the agriculture sector must play a more important role than it has in recent years.

**Infrastructure**

Infrastructure has long been a stumbling block for India's economy and has not kept pace with the growth of manufacturing industries. Shortages of electricity and the unreliability of supply are universally recognized as harmful to India's development (Kapila 2007a). Improvements in other infrastructure facilities, especially in the areas of coal, water, roads, and ports, will also be critical to sustaining or accelerating industrial growth.14

Substandard electric power infrastructure is the largest constraint on economic growth and the most difficult to tackle. Power supply expansion fell well short of targets set for the Tenth Five Year Plan, as was also the case under the previous plans. In 2007, India faced an average power shortfall of about 10%—and more than 13% in peak periods—according to RBI. Peak shortages are as high as 25% in some states. The Economic Advisory Council to the Prime Minister (EACPM, 2008) reports that the

---

14 Ironically, one of the reasons IT was able to take off in India was its lack of dependence on physical infrastructure.

---

**Table 9: Annual Average Growth Rate at Constant Prices (%)**

<table>
<thead>
<tr>
<th>5-Year Plan</th>
<th>Overall GDP Growth Rate</th>
<th>Agriculture and Allied Sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seventh Plan (1985–1990)</td>
<td>6.0</td>
<td>3.2</td>
</tr>
<tr>
<td>Annual Plan (1990–1992)</td>
<td>3.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Eighth Plan (1992–1997)</td>
<td>6.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Ninth Plan (1997–2002)</td>
<td>5.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Tenth Plan (2002–2007)</td>
<td>7.6</td>
<td>2.3</td>
</tr>
<tr>
<td>2002/03</td>
<td>3.8</td>
<td>(7.2)</td>
</tr>
<tr>
<td>2003/04</td>
<td>8.5</td>
<td>10.0</td>
</tr>
<tr>
<td>2004/05a</td>
<td>7.5</td>
<td>0.0</td>
</tr>
<tr>
<td>2005/06b</td>
<td>9.0</td>
<td>6.0</td>
</tr>
<tr>
<td>2006/07c</td>
<td>9.2</td>
<td>2.7</td>
</tr>
</tbody>
</table>

GDP = gross domestic product, ( ) = negative value.

a Provisional.
b Quick estimate.
c Advanced estimate.

Note: Growth rates prior to 2001 based on 1993/94 prices, and from 2000/01 onward based on new series at 1999/00 prices.

Source: Central Statistical Organisation, Government of India.

---
all-India power supply deficit for April–November 2007 was 7.9%. A 2006 World Bank appraisal pointed out that the average manufacturer loses 8.4% in sales annually due to power outages and that over 60% of Indian manufacturing firms’ own generator sets, compared to 27% in the PRC. In fact, India’s combined real cost of power is almost 40% higher than that in the PRC.

India has also missed its planning and growth targets in many other infrastructure sectors. A critical lack of roads and urban infrastructure—as well as their existing deterioration—impinges on the competitiveness of its manufacturing. In addition, problems like transport bottlenecks have hampered industrial performance and have played a part in raising the costs and lowering the competitiveness of Indian goods.

These problems reflect failures in public sector performance and governance. Inadequate cost recovery in infrastructure services is eroding the economic viability of the sector. Provision of infrastructure by the public sector stands in the way of attracting private investment into this area. Since electric power, roads, ports, and railways are crucial—and since these services cannot be imported—sufficient investments and efficient use of existing and new capacities in these sectors are essential prerequisites for the acceleration of economic development. Apart from investment, issues of governance and management need to be addressed before satisfactory results can be achieved, including policies relating to appropriate pricing and user charges.

Regional Disparities

India is characterized by enormous variations in regional experiences and achievements. The state domestic product (SDP) of the country’s states can differ dramatically, as can their growth rates. Per capita SDP growth in the 1980s ranged from a low of 2.1% annually for Madhya Pradesh to a high of 4.0% for Rajasthan. In the 1990s, it ranged from a low of 1.1% in Bihar and 1.2% in Uttar Pradesh to almost seven times higher, at 7.6%, in Gujarat (Kapila 2007b).

These interstate disparities have increased in the post-reform period, with richer states generally growing faster than poorer ones. The per capita differences are even greater because the poorer states have also generally experienced faster population growth (Rao 2006). States with per capita SDP below the national average account for over 60% of India’s population and as much as 75% of the country’s poor (Kapila 2007a).

India must improve regional and social equity and strengthen national integration. Over the years, it has made some progress in human development, but it cannot be denied that the acceleration in the country’s economic growth has not fully translated into a commensurate decline in poverty. Indeed, poverty has been reduced at only a modest pace. Income poverty, for instance, has fallen from 36% in the early 1990s to somewhere between 25% and 30% today (Kapila 2007a). According to the Human Development Report by the United Nations Development Programme (2003), India is home to more poor people than any other country—one-fifth of the world’s total. As many as 260 million people live below the national poverty line (Kapila 2007a).

Despite its economic rise in the last decade, India’s performance on human development has been mixed. Life expectancy and infant mortality rates have improved more slowly than expected. Undernutrition among women and children is

---

15 Precise figures are widely disputed because of problems with survey data.
widespread, and maternal and child health remain areas of concern. India is not on track to achieve its Millennium Development Goals, as too many people still lack access to basic services like health, education, clean drinking water, and sanitation facilities, without which they cannot be empowered to claim their share in the benefits of growth. These problems are more severe in some states than in others and, in general, are especially serious in rural areas.

Economic growth has the capacity to reduce this poverty. Indeed, rapid growth is important to poverty reduction not only because it can generate income opportunities for the poor but also because it increases tax revenues needed to finance anti-poverty programs. India now needs to find ways to translate its growth into poverty alleviation. In other words, it must generate poverty-reducing growth—i.e., the kind of growth that the poor can both contribute to and benefit from. Pro-poor policies are needed to widen the opportunities and capabilities of the poor. These policies should include not only income transfers, which, by their very nature, must be limited, but also a flow of investment to sectors and areas in which the poor work and live.

**Two-Wheel Growth**

Unlike the PRC, where exports contribute greatly to GDP, India’s growth is essentially driven by domestic demand. More specifically, there is increasing evidence that India’s growth is driven by two wheels: investment and consumption. Both have contributed almost equally to GDP growth since 2003 (Table 10).

The upsurge in India’s growth has been backed by increases in savings and investment. India is now one of the world’s high-saving economies. The savings rate—i.e., gross domestic savings as a percentage of GDP—increased from an average of around 10% in the 1950s to over 23% in the 1990s. It crossed the 25% mark in the mid-1990s and reached its highest level of 35.6% in 2007/08. Several factors have propelled this unprecedented expansion of savings, including changes in corporate dynamics, fiscal consolidation, reforms in capital markets, and external capital inflows. Acharya (2007) stated that a decline in both the gross fiscal deficit and revenue deficit was the important factor, but it may be a result of the faster pace of growth in income, relative to consumption. Similarly, the private corporate sector has financed a large part of its investment from retained earnings or savings that resulted from continuous growth. Internal sources are now a major source of funds, thereby reducing the dependence on borrowings, and the debt–equity ratio declined to around 53% by 2004/05 from more than 59% during the 1990s (RBI 2007).

The average investment ratio for the Tenth Five Year Plan, at 31.4%, was higher than that for the ninth plan, and the average savings rate was also 31.4% of GDP, compared with a lower average ratio of 23.6% in the previous plan (MOF 2008).

As a forward-looking variable, investment reflects the degree of business optimism. The prime mover in achieving high growth in India is the increasing share of investment in gross domestic expenditure. The investment boom began in 2003/04 and has gained considerable momentum since. Data for 2006/07 suggest that this trend will continue, with the rate of gross fixed capital formation increasing to 29.5% of GDP. Encouraging indications point to a steady improvement in capital use, and this is a turnaround in total factor productivity in manufacturing since 2002/03. Modernization of the capital stock, reduction and/or rationalization of import tariffs and other taxes, increased openness of the economy, higher FDI inflows, greater competitive
### Table 10: Contribution to Economic Growth by Disposition of Expenditure

<table>
<thead>
<tr>
<th></th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07</th>
<th>2007/08</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rate of year-on-year growth at constant (1999/000) prices</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross domestic product</td>
<td>4.0</td>
<td>5.2</td>
<td>3.7</td>
<td>8.4</td>
<td>8.3</td>
<td>9.2</td>
<td>9.4</td>
<td>9.0</td>
</tr>
<tr>
<td>Investment (gross domestic capital formation) including EO</td>
<td>(4.5)</td>
<td>(1.8)</td>
<td>16.6</td>
<td>19.1</td>
<td>19.0</td>
<td>16.5</td>
<td>14.8</td>
<td>15.4</td>
</tr>
<tr>
<td>Gross domestic capital formation (excluding EO)</td>
<td>(4.8)</td>
<td>2.1</td>
<td>10.8</td>
<td>13.9</td>
<td>18.1</td>
<td>18.0</td>
<td>15.1</td>
<td>15.5</td>
</tr>
<tr>
<td><strong>of which:</strong> Private corporate sector</td>
<td>(20.2)</td>
<td>(2.4)</td>
<td>15.2</td>
<td>25.0</td>
<td>53.2</td>
<td>41.1</td>
<td>25.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Public sector</td>
<td>(3.0)</td>
<td>2.9</td>
<td>(7.1)</td>
<td>8.3</td>
<td>16.5</td>
<td>15.6</td>
<td>16.0</td>
<td>15.5</td>
</tr>
<tr>
<td>Household sector</td>
<td>4.9</td>
<td>4.4</td>
<td>21.0</td>
<td>8.9</td>
<td>(2.9)</td>
<td>1.7</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Gross domestic fixed capital formation</td>
<td>0.3</td>
<td>4.5</td>
<td>8.7</td>
<td>13.1</td>
<td>11.8</td>
<td>15.3</td>
<td>14.6</td>
<td>16.1</td>
</tr>
<tr>
<td>Final consumption expenditure</td>
<td>1.6</td>
<td>6.1</td>
<td>1.8</td>
<td>6.2</td>
<td>5.4</td>
<td>7.2</td>
<td>6.6</td>
<td>6.2</td>
</tr>
<tr>
<td><strong>Share in incremental GDP at constant (1999/000) prices in %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment (gross domestic capital formation)</td>
<td>(29.0)</td>
<td>(8.0)</td>
<td>99.0</td>
<td>57.0</td>
<td>63.0</td>
<td>54.0</td>
<td>51.0</td>
<td>57.7</td>
</tr>
<tr>
<td><strong>of which:</strong> Private corporate sector</td>
<td>(36.8)</td>
<td>(2.6)</td>
<td>21.3</td>
<td>17.3</td>
<td>42.8</td>
<td>42.2</td>
<td>32.8</td>
<td>41.5</td>
</tr>
<tr>
<td>Public sector</td>
<td>(5.5)</td>
<td>3.9</td>
<td>(12.8)</td>
<td>6.0</td>
<td>11.9</td>
<td>11.0</td>
<td>11.7</td>
<td>11.2</td>
</tr>
<tr>
<td>Household sector</td>
<td>12.8</td>
<td>9.1</td>
<td>59.4</td>
<td>13.1</td>
<td>(4.3)</td>
<td>2.1</td>
<td>0.2</td>
<td>1.7</td>
</tr>
<tr>
<td>Gross domestic fixed capital formation</td>
<td>1.9</td>
<td>19.6</td>
<td>52.2</td>
<td>36.5</td>
<td>34.6</td>
<td>41.8</td>
<td>41.7</td>
<td>51.6</td>
</tr>
<tr>
<td>Private final consumption expenditure</td>
<td>41.4</td>
<td>73.3</td>
<td>37.2</td>
<td>51.4</td>
<td>40.0</td>
<td>44.1</td>
<td>39.0</td>
<td>38.1</td>
</tr>
<tr>
<td>Government final consumption expenditure</td>
<td>(11.6)</td>
<td>14.5</td>
<td>(1.1)</td>
<td>3.5</td>
<td>7.1</td>
<td>11.4</td>
<td>10.4</td>
<td>8.4</td>
</tr>
<tr>
<td>Total final consumption expenditure</td>
<td>29.8</td>
<td>87.8</td>
<td>36.1</td>
<td>54.9</td>
<td>47.2</td>
<td>55.5</td>
<td>49.4</td>
<td>46.5</td>
</tr>
<tr>
<td>Net exports of goods and services</td>
<td>40.9</td>
<td>5.6</td>
<td>40.9</td>
<td>(17.5)</td>
<td>29.0</td>
<td>(6.1)</td>
<td>(3.4)</td>
<td>(3.0)</td>
</tr>
</tbody>
</table>

*continued on next page*
### Contribution to GDP growth at constant (1999/2000) prices in %

<table>
<thead>
<tr>
<th></th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07</th>
<th>2007/08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment (gross domestic capital formation)</td>
<td>(1.16)</td>
<td>(0.43)</td>
<td>3.69</td>
<td>4.77</td>
<td>5.22</td>
<td>4.97</td>
<td>4.75</td>
<td>5.19</td>
</tr>
<tr>
<td>Gross domestic fixed capital formation</td>
<td>0.08</td>
<td>1.02</td>
<td>1.95</td>
<td>3.06</td>
<td>2.88</td>
<td>3.86</td>
<td>3.90</td>
<td>4.64</td>
</tr>
<tr>
<td>Final consumption expenditure</td>
<td>1.20</td>
<td>4.57</td>
<td>1.34</td>
<td>4.60</td>
<td>3.93</td>
<td>5.12</td>
<td>4.62</td>
<td>4.18</td>
</tr>
<tr>
<td>Private final consumption expenditure</td>
<td>1.67</td>
<td>3.82</td>
<td>1.39</td>
<td>4.31</td>
<td>3.33</td>
<td>4.07</td>
<td>3.65</td>
<td>3.43</td>
</tr>
<tr>
<td>Net exports of goods and services</td>
<td>1.65</td>
<td>0.29</td>
<td>1.53</td>
<td>(1.47)</td>
<td>2.42</td>
<td>(0.56)</td>
<td>(0.31)</td>
<td>(0.27)</td>
</tr>
</tbody>
</table>

### Memo Items

<table>
<thead>
<tr>
<th></th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06</th>
<th>2006/07</th>
<th>2007/08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment rate (% of GDP)</td>
<td>24.0</td>
<td>22.9</td>
<td>25.2</td>
<td>28.0</td>
<td>31.5</td>
<td>33.8</td>
<td>35.1</td>
<td>36.3</td>
</tr>
<tr>
<td>Domestic savings rate (% of GDP)</td>
<td>28.4</td>
<td>23.5</td>
<td>26.4</td>
<td>29.7</td>
<td>31.1</td>
<td>32.4</td>
<td>34.7</td>
<td>35.6</td>
</tr>
</tbody>
</table>

EO = errors and omissions, GDP = gross domestic product.

Note: Figures in parentheses are negative numbers.

Source: Central Statistical Organisation, Government of India.
pressures, increased investment in information and communication technology, and greater financial deepening are contributing to productivity gains in the industry and services sectors.

The acceleration in growth of fixed capital formation reflects the vast improvement in India’s investment climate as a result of the 1990s reforms. The revival in domestic capital formation that started in 2002/03 has been followed by a sharp rise in investment in each of the 4 ensuing years. During 2006/07, domestic fixed capital formation remained strong for the fifth consecutive year, recording an increase of 14.6%. Growth averaged 13.7% per year in 2003/04 to 2006/07. Almost 42% of the incremental growth in real GDP in 2006/07 was due to gross fixed capital formation. The increase in investment has supported industrial performance.

**Privately Driven Growth**

From the demand-side perspective, unlike the countries of East Asia during their high-growth phase, or the PRC in more recent times, growth in India in the post-reform period has been driven mostly by private final consumption expenditure. This expenditure contributed more than half of the growth every year until 2001/02. After falling below 50% in 2002/03, it again dominated GDP growth in 2003/04. However, this pattern now appears to have undergone a transformation, with private investment becoming the main source of GDP growth in 2004/05 and 2005/06. The main financial source of investment is domestic private savings. In fact, a dramatic element in the savings profile of India’s economy has been the sharp rise in the savings rate of the private corporate sector for 4 years in a row.

Investment is a key variable in understanding growth performance. A glaring feature of India’s domestic investment scene in the post-reform period is the steady decline in the rate of public investment, particularly at the state level, and the steep rise in the share of private investment (Kapila 2007a). The rate of private investment began to accelerate in the new century, from 16.3% of GDP in 2001/02 to 23.6% in 2005/06. Public investment, meanwhile, has remained unchanged at 6%–7% of GDP since 1991.

Higher growth together with the demographic dividend—from the growth in the proportion of the population who are of working age—will likely lead to a rise in the savings rate to finance even more investment. This mutually reinforcing growth–savings–growth cycle is evident in the recently released savings and investment figures for 2005/06. Unlike the one-child policy in the PRC, the demographic dividend in India was not achieved by government policy but rather by private choice. Indeed, the common thread running through India’s economic reforms, particularly those since 1991, has been the freeing of the economy from governmental controls to let market forces determine economic activity.

An example is provided by the IT sector, where debate continues over what role government played—or did not play—to develop the sector. Some government officials have claimed that government policy exerted a beneficiary influence, but the business and academic community insist that the government did almost nothing. In fact, some businesspeople argue that IT development benefited from a hands-off approach by the government and from the fact that the software industry initially escaped legal constraints because it was not immediately recognized by the government as an industry.
Table 11: Savings and Investment (base = 1999/2000)

<table>
<thead>
<tr>
<th>% of GDP at Current Market Prices</th>
<th>1999/2000</th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>2003/04</th>
<th>2004/05</th>
<th>2005/06c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross domestic savings</td>
<td>24.8</td>
<td>23.4</td>
<td>23.5</td>
<td>26.4</td>
<td>29.7</td>
<td>31.1</td>
<td>32.4</td>
</tr>
<tr>
<td>• Public</td>
<td>(0.8)</td>
<td>(1.9)</td>
<td>(2.0)</td>
<td>(0.6)</td>
<td>1.2</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>• Private</td>
<td>25.6</td>
<td>25.3</td>
<td>25.5</td>
<td>27.0</td>
<td>28.5</td>
<td>28.7</td>
<td>30.4</td>
</tr>
<tr>
<td>i) Household</td>
<td>21.1</td>
<td>21.0</td>
<td>21.8</td>
<td>22.7</td>
<td>23.5</td>
<td>21.6</td>
<td>22.3</td>
</tr>
<tr>
<td>Financial</td>
<td>10.6</td>
<td>10.2</td>
<td>10.8</td>
<td>10.3</td>
<td>11.3</td>
<td>10.2</td>
<td>11.7</td>
</tr>
<tr>
<td>Physical</td>
<td>10.5</td>
<td>10.8</td>
<td>10.9</td>
<td>12.4</td>
<td>12.4</td>
<td>11.4</td>
<td>10.7</td>
</tr>
<tr>
<td>ii) Private corporate</td>
<td>4.5</td>
<td>4.3</td>
<td>3.7</td>
<td>4.2</td>
<td>4.7</td>
<td>7.1</td>
<td>8.1</td>
</tr>
<tr>
<td>Gross domestic investment (^a)</td>
<td>25.9</td>
<td>24.0</td>
<td>22.9</td>
<td>25.2</td>
<td>28.0</td>
<td>31.5</td>
<td>33.8</td>
</tr>
<tr>
<td>• Public</td>
<td>7.4</td>
<td>6.9</td>
<td>6.9</td>
<td>6.1</td>
<td>6.3</td>
<td>7.1</td>
<td>7.4</td>
</tr>
<tr>
<td>• Private</td>
<td>17.9</td>
<td>16.5</td>
<td>16.3</td>
<td>18.4</td>
<td>19.4</td>
<td>21.3</td>
<td>23.6</td>
</tr>
<tr>
<td>• Valuables</td>
<td>0.8</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
<td>0.9</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Gross fixed capital formation</td>
<td>23.4</td>
<td>22.8</td>
<td>23.0</td>
<td>23.8</td>
<td>24.8</td>
<td>26.3</td>
<td>28.1</td>
</tr>
<tr>
<td>• Change in stocks</td>
<td>1.9</td>
<td>0.6</td>
<td>0.2</td>
<td>0.7</td>
<td>0.8</td>
<td>2.0</td>
<td>2.9</td>
</tr>
<tr>
<td>• Valuables</td>
<td>0.8</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
<td>0.9</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>• Saving-investment Gap (^b)</td>
<td>(1.1)</td>
<td>(0.6)</td>
<td>0.6</td>
<td>1.2</td>
<td>1.6</td>
<td>(0.4)</td>
<td>(1.3)</td>
</tr>
<tr>
<td>• Public</td>
<td>(8.2)</td>
<td>(8.8)</td>
<td>(8.9)</td>
<td>(6.6)</td>
<td>(5.2)</td>
<td>(4.7)</td>
<td>(5.4)</td>
</tr>
<tr>
<td>• Private</td>
<td>7.7</td>
<td>8.8</td>
<td>9.2</td>
<td>8.6</td>
<td>9.2</td>
<td>7.4</td>
<td>6.9</td>
</tr>
</tbody>
</table>

GDP = gross domestic product.

Notes: Gross domestic investment denotes gross domestic capital formation. Figures may not add up due to rounding. Figures in parentheses are negative numbers.
\(^a\) Adjusted for errors and omissions.
\(^b\) Difference between the rate of savings and the rate of investment.
\(^c\) Quick estimates.

Source: Central Statistical Organisation, Government of India, various issues.

India did not create its Department of Information Technology until 1999, by which time the IT sector—with revenue of $8.2 billion—already accounted for 2% of GDP. The IT Law was not enacted until 17 October 2000, when the fast-growing sector needed a legal framework. Furthermore, the Information Technology Amendment Bill was not introduced until 2006 to put technology applications and security practices in place. The legislation also addressed the issue of technological neutrality in IT laws, as recommended by the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Signature (RBI 2007).

This vigorous private sector growth alongside perennially uninspired public sector performances is one of the most striking aspects of India’s economy. It provides tentative evidence to suggest that the new round of growth in India is privately driven, not government-led. The economy is growing naturally with relatively little government intervention, and private entrepreneurs have played a vital role.
Open Growth with Indian Ownership

The reforms begun in 1991 launched India’s transition from a policy regime with very high rates of protection and all-pervasive quantitative restrictions to moderate protection and removal of quantitative restrictions. The currency was devalued and the exchange rate was made market-responsive. Peak import duties on manufacturers have come down from over 200% to 12.5%. Tight, detailed, and discretionary import controls have been almost completely dismantled. Due to the sustained boom in software exports and worker remittances, the ratio of current receipts (goods exports plus gross invisibles) more than tripled from 8% to over 24% of GDP.

Table 12: India’s Open Economy

<table>
<thead>
<tr>
<th>Indicator</th>
<th>1990/91</th>
<th>2006/07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak import duties (manufacturers)</td>
<td>200%+</td>
<td>12.5%</td>
</tr>
<tr>
<td>Import controls</td>
<td>Tight, detailed</td>
<td>Almost gone</td>
</tr>
<tr>
<td>Trade in goods (% of GDP ratio)</td>
<td>14.6</td>
<td>34.8</td>
</tr>
<tr>
<td>Software exports ($ billion)</td>
<td>0.0</td>
<td>32.1</td>
</tr>
<tr>
<td>Worker remittances ($ billion)</td>
<td>2.1</td>
<td>27.4</td>
</tr>
<tr>
<td>Foreign investment ($ billion)</td>
<td>Negligible</td>
<td>23.0</td>
</tr>
<tr>
<td>Foreign currency reserves ($ billion, 31 March)</td>
<td>2.2</td>
<td>199.2</td>
</tr>
<tr>
<td>Debt service ratio (%)</td>
<td>35.3</td>
<td>4.8</td>
</tr>
</tbody>
</table>

GDP = gross domestic product.
Source: Ministry of Finance 2008; Reserve Bank of India 2007.

Although unremarkable so far, India’s trade in goods is starting to grow as barriers come down. The most dynamic export sector is ITESs for global companies, including call centers, and software application, design, and maintenance. A majority of its IT companies have already aligned their internal processes and practices to international standards, such as Six Sigma, helping establish India as a credible sourcing destination. As of December 2006, over 400 Indian companies had acquired quality certifications, with 82 companies certified at Software Engineering Institute’s Capability Maturity Model (SEI CMM) Level 5—the highest number of any country in the world.

India’s links with the global economy have strengthened as a result of its opening up and foreign trade—an important dimension of global integration—has risen steadily as a proportion of GDP. The ratio of merchandise exports to GDP increased from 5.8% in 1990/91 to 13.9% in 2006/07, while that of imports increased from 8.8% to 21.1% over the same period. India’s greater integration with the world is reflected in the trade openness indicator—the trade–GDP ratio—which increased from 22.5% in 2000/01 to 34.8% in 2006/07. If service trade is included, the increase is higher, at 48% in 2006/07 from 29.2% of GDP in 2000/01 (MOF 2008). India has been widely heralded as a success story for globalization.16

16 The story of India’s external liberalization can be found, for example, in Acharya (2002) and Panagariya (2004).
India’s policies toward foreign investment have also been greatly liberalized. High GDP growth attracts foreign capital looking for investment opportunities. Inward FDI has increased, and there is a surge in outward investment from a low base, with net FDI continuing to grow at a good pace. Capital flows, as a proportion of GDP, reached a high of 5.1% in 2006/07, up from negligible levels. This is a natural outcome of the improved investment climate and recognition of strong macroeconomic fundamentals like high growth, a healthy financial sector, and high returns on investment. Indeed, foreign trade and foreign investment have pulled domestic demand and pushed up domestic supply. Consequently, this has substantially supported economic growth.

India did impose certain equity caps on FDI in some sectors, although they have been liberalized to some extent. FDI inflows have been mainly in the form of equity, which accounted for 75.2% of total FDI in India during 2005/06. As a result, most—if not all—goods and services made in India are those produced and delivered by Indian companies. The foreign sector now accounts for less than 5% of GDP. For most goods, “made in India” means goods “made by India.”

**Reasons Behind the Success**

**A Change from Inward- to Outward-Looking**

In its first plateau, which lasted over 3 decades (1947–1980), India’s economic policy was based on a model of national self-sufficiency and built around an import substitution industrialization strategy—inward-looking development. This quest for self-sufficiency was powered by a belief that there was value in minimizing India’s external dependence and producing what it needed itself, even if this meant high costs and low efficiency.

In the 1980s, India realized that it must break away from the old model. Self-sufficiency, as an ideal, was abandoned. So, the country borrowed abroad. However, borrowings were made in debt form to retain political control over resources, proving fatal. While the strategy met with some success in bringing in capital and investment, it turned out to be costly in terms of economic efficiency. Against a background of a low export–GDP ratio, the problems of rising trade and current account deficits and a deteriorating external debt profile, among others, tipped India’s balance of payments into crisis in 1990/91 (Acharya 2007).

The economy crashed as it became unable to service its debt. However, the government seized the opportunity offered by the crisis to launch an array of economic reforms, which encouraged integration with the world economy by removing controls on foreign trade and exchange rates, lowering tariffs, and relaxing regulations over foreign capital flows. In making these changes, India signaled that it was abandoning its export pessimism and accepting the challenge and opportunity of integrating into the global economy. The reforms marked a significant break with the past in the area of foreign investment. From a policy that was restrictive and selective, and that supported mainly technology transfers, foreign investment policy became more open and proactive. The rules were liberalized with a view not only to obtaining advanced technology but also to building strategic alliances to penetrate the world market.

---

17 See, for example, the classic study by Bhagwati and Desai (1970).
Now, India considers capital account liberalization a process, not a single event. In relaxing capital controls, it treats flows asymmetrically. Inflows are less restricted, outflows associated with inflows are free, while other outflows are more restricted.

In 1992, the government announced guidelines for foreign investments in the capital market. Foreign institutional investors were welcomed to invest in all types of securities traded on the primary and secondary markets, with full repatriation benefits, no restrictions on volume of trading, and no lock-in period. More favorable treatment was accorded to nonresident Indian investors, who can own up to 100% of priority industries. As a result, Indian companies have greatly benefited from foreign investment in their stocks and through overseas listing. However, efficiency-seeking or export-oriented FDI has yet to start flowing in significant amounts (Kapila 2007a).

Indian companies have directly benefited from their interaction with global investors, expanding their ability to tap into global markets and internalizing best practices. Some are fast emerging as efficient, low-cost, and international-class producers. They are enhancing their global service delivery capabilities through a combination of greenfield initiatives, cross-border mergers and acquisitions, and partnerships and alliances with local players. This enables them to execute end-to-end delivery of new services and increase their global presence by harnessing scale, technology, and market access advantages. Global software giants such as Microsoft, Oracle, and SAP have established their captive development centers in India.

However, although foreign investment reforms represented a break with the past in India, they are modest compared with the concessions offered by the PRC. In the early 1990s, India's tax rates for foreign companies were higher than those for domestic ones. The PRC gives foreign investors favorable treatment; at best, India treats them equally. This helps explain why foreign portfolio investment in India has been greater than FDI.

FDI, however, has recently increased in India, and flows in 2006/07 were significantly higher than portfolio flows. India's share in global FDI increased from 2.3% in 2005 to 4.5% in 2006. India has emerged as the second most-preferred FDI destination among the developing countries, after the PRC, according to the World Investment Report 2008 prepared by the United Nations Conference on Trade and Development (UNCTAD). MOF called the 150% growth in net FDI inflows in 2006–2007, to $23 billion, the most welcome feature of the improving capital flow picture. These inflows, moreover, were spread broadly across a range of economic activities like financial and banking services, manufacturing, ITESs, and construction.

FDI outflows have also responded to reforms, including liberalization and the granting of automatic approval for proposals that fulfill certain norms. In 2006/07, outward investment by Indian enterprises jumped sharply to $11 billion, up 275% from the previous year’s $2.9 billion. This reflected overseas acquisitions of companies and fixed assets by Indian companies (EACPM 2008), which is possibly the best way for them to access world-class technology, research, and development and to have footholds and distribution networks in the world market. In the last few years, the seeds have thereby been planted for the globalization of Indian enterprises and the creation of Indian multinationals.
Table 13: Foreign Direct and Foreign Portfolio Investment to Select Countries ($ million)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>3,584</td>
<td>5,472</td>
<td>5,626</td>
<td>4,585</td>
<td>5,474</td>
<td>6,598</td>
<td>2,345</td>
<td>2,853</td>
<td>1,022</td>
<td>8,216</td>
<td>8,835</td>
<td>11,968</td>
</tr>
<tr>
<td>Argentina</td>
<td>10,418</td>
<td>2,166</td>
<td>2,149</td>
<td>1,652</td>
<td>4,274</td>
<td>4,730</td>
<td>(3,227)</td>
<td>31</td>
<td>(116)</td>
<td>65</td>
<td>(86)</td>
<td>(48)</td>
</tr>
<tr>
<td>Brazil</td>
<td>32,779</td>
<td>22,457</td>
<td>16,590</td>
<td>10,144</td>
<td>18,166</td>
<td>15,193</td>
<td>3,076</td>
<td>2,481</td>
<td>1,981</td>
<td>2,973</td>
<td>2,081</td>
<td>6,451</td>
</tr>
<tr>
<td>Chile</td>
<td>4,860</td>
<td>4,200</td>
<td>2,550</td>
<td>4,307</td>
<td>7,173</td>
<td>6,667</td>
<td>(427)</td>
<td>(217)</td>
<td>(320)</td>
<td>318</td>
<td>8</td>
<td>1,635</td>
</tr>
<tr>
<td>PRC</td>
<td>38,399</td>
<td>44,241</td>
<td>49,308</td>
<td>47,077</td>
<td>54,936</td>
<td>79,127</td>
<td>6,912</td>
<td>849</td>
<td>2,249</td>
<td>7,729</td>
<td>10,923</td>
<td>20,346</td>
</tr>
<tr>
<td>Indonesia</td>
<td>(4,550)</td>
<td>(2,977)</td>
<td>145</td>
<td>(597)</td>
<td>1,896</td>
<td>5,260</td>
<td>(1,021)</td>
<td>442</td>
<td>877</td>
<td>1,131</td>
<td>2,043</td>
<td>(165)</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3,788</td>
<td>554</td>
<td>3,203</td>
<td>2,473</td>
<td>4,624</td>
<td>3,966</td>
<td>0</td>
<td>0</td>
<td>(55)</td>
<td>1,340</td>
<td>4,239</td>
<td>(1,200)</td>
</tr>
<tr>
<td>Mauritius</td>
<td>266</td>
<td>(28)</td>
<td>32</td>
<td>63</td>
<td>14</td>
<td>39</td>
<td>(4)</td>
<td>(9)</td>
<td>(1)</td>
<td>8</td>
<td>19</td>
<td>36</td>
</tr>
<tr>
<td>Mexico</td>
<td>17,773</td>
<td>27,142</td>
<td>19,044</td>
<td>15,256</td>
<td>18,941</td>
<td>18,772</td>
<td>447</td>
<td>151</td>
<td>(104)</td>
<td>(123)</td>
<td>(2,522)</td>
<td>3,353</td>
</tr>
<tr>
<td>Philippines</td>
<td>2,240</td>
<td>195</td>
<td>1,542</td>
<td>491</td>
<td>688</td>
<td>1,132</td>
<td>(202)</td>
<td>125</td>
<td>227</td>
<td>501</td>
<td>518</td>
<td>1,461</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>2,714</td>
<td>2,748</td>
<td>3,461</td>
<td>7,958</td>
<td>15,444</td>
<td>15,151</td>
<td>150</td>
<td>542</td>
<td>2,626</td>
<td>422</td>
<td>233</td>
<td>(215)</td>
</tr>
<tr>
<td>South Africa</td>
<td>969</td>
<td>7,270</td>
<td>735</td>
<td>783</td>
<td>701</td>
<td>6,257</td>
<td>4,169</td>
<td>(962)</td>
<td>(388)</td>
<td>685</td>
<td>6,661</td>
<td>7,230</td>
</tr>
<tr>
<td>Thailand</td>
<td>3,366</td>
<td>3,892</td>
<td>953</td>
<td>1,949</td>
<td>1,718</td>
<td>4,527</td>
<td>901</td>
<td>352</td>
<td>539</td>
<td>1,787</td>
<td>1,319</td>
<td>5,665</td>
</tr>
</tbody>
</table>

PRC = People's Republic of China.
Note: Figures in parentheses are negative numbers.
Source: Global Development Finance Online.
Reforms

The first generation of reforms initiated in 1991 represented a shift from the earlier paradigm. They encompassed fiscal stabilization, external sector liberalization, deregulation of industry, reforms in taxation and the financial sector, and a more commercial approach to the public sector. The underlying rationale of these wide-ranging changes was to give India's economy a greater market orientation and to let competitive forces and growth impulses come into fuller play.

Tax Reforms

India's tax reform is aimed at creating an increasingly efficient, liberal, and equitable system through reasonable rates, fewer exemptions, and a wider tax base. The maximum personal income tax rate has dropped from 56% to 30%. Corporate taxes on Indian companies, which varied from 51.75% to 57.50% in 1991/92, have been unified and reduced to 35.00% in 2001 (Bajpai 2002). In 2006, corporate tax was further reduced to 30.00%.

India has first introduced value-added tax at the central government. Here, credit is given for excise taxes paid on inputs against excise taxes due on outputs. This tax credit facility, previously not available for all products, is now universal, and—while it was once given only for duties paid on inputs—it was extended in 1995 to duties paid on capital goods (Bajpai 2002). On 1 April 2005, value-added tax has been introduced at the state level.

India also provides a tax exemption to venture capital funds for undertakings in biotechnology, IT relating to hardware and software development, nanotechnology, seed research and development, research and development of new chemical entities in the pharmaceutical sector, dairy industry, poultry industry, and production of biofuels. Moreover, to promote export of services, all services rendered abroad have been exempted from the service tax. These reforms and tax cuts have made the tax burden and the gross tax–GDP ratio in India among the lowest in the world.

Reforms in the Trade and Foreign Investment Regimes

India also took measures to simplify and liberalize the external payments regime and deepen the foreign exchange market to facilitate exports. They included devaluing the rupee, making the currency convertible on current accounts, liberalizing the trade regime, allowing imports of gold, encouraging foreign investment and technology inflows, opening the capital market to portfolio investment by foreign investors, and permitting domestic companies to access foreign capital markets.

Changes in foreign trade policies focused on reducing tariff rates and dismantling quantitative controls over imports. Import-substitution policies—which included pervasive quantitative restrictions on imports and steep customs duties—were changed, and the import licensing system was dismantled. Nontariff barriers were phased out for all tradable goods except consumer goods. The process of removing import restrictions began in 1991 and was completed on 715 items. Then, to sustain growth and make more input materials available at competitive rates to domestic manufacturers, the government gradually cut customs duties across several categories. Tariffs have declined from a peak of 150% in 1990 to a top nonagricultural rate of 10% in 2007–2008. However, agricultural tariffs remain relatively high and stable, isolating this segment of the economy from both the benefits and costs of globalization. In the new century, import controls on consumer goods were eliminated.
The exchange rate regime was relaxed and rationalized, and the rules relating to FDI and foreign technology agreements were also liberalized. The rupee was devalued twice in July 1991. In March 1993, the dual exchange rate was unified, and the unified rate was allowed to float. The partial convertibility of the rupee on the trade account was announced in the 1992/93 budget that was subsequently broadened to full convertibility on current account by August 1994.

Foreign investment reforms since 1991 broke significantly with the past. From a policy that was restrictive, selective, and supported mainly by technology transfers, foreign investment policy became more open and proactive as the rules were liberalized over time with a view not only to gain better access to technology but also to compete in the world market. Foreign investors were permitted to become the majority shareholders in a wide spectrum of industries. The process of approving FDI was expedited by providing a window of automatic approval. A foreign investment promotion board was set up to consider proposals that did not qualify automatically. As of 2001, 100% foreign ownership was allowed in a large number of industries, including high technology, export-oriented enterprises, energy and infrastructure projects, consultancy, and trading companies. Majority foreign ownership was permitted in all businesses except banking, insurance, telecommunications, and airlines.

Internal liberalization was implemented to cut costs for Indian industries, relieve production bottlenecks, and promote improved technology and exports. The trade liberalization increased competitive pressure, left enterprises free to make their production and investment decisions in the light of market conditions, and enlarged the scope and freedom of private entrepreneurs. As a result, the role of private investment has greatly expanded. India's states increasingly worked to attract domestic and foreign investment and expedite their decision-making processes for investors, especially for the provision of land, electricity, water, and other infrastructure.

Reforms in Industrial Policy
The greatest reforms have been in India’s industrial policy. The government has dismantled most industrial controls, including a complex regime of licenses, permits, and regulations that dictated almost every facet of production and distribution—what to produce, where to produce, how to produce, and how much to produce. Government permission, for example, was needed for investment not only in new units but also for substantial expansion of existing units. The government noted that India’s industry could not compete with foreign counterparts if it continued to operate in an overregulated environment. The licensing system led to abuse, corruption, and delays and was undoubtedly responsible for many of the inefficiencies that plagued India’s industry.

The New Industry Policy announced on 24 July 1991—and its subsequent amendments—brought far-reaching changes. They abolished the licensing system, requirement that enterprise expansion be approved, and need for registration under the Monopolies and Restrictive Trade Practices Act (1969). The reforms progressively diluted the monopoly of public sector industries, got rid of the levy and nonlevy price system, and reduced purchase preference for public sector enterprises. The thrust has been the creation of a more competitive environment and improved productivity and efficiency—in other words, internal liberalization. In 2002, the government enacted the Competition Act to uphold competition in the market (Kapila 2007a).

Industrial licensing was dismantled in all but seven sectors—alcoholic beverages, sugar, cigars and cigarettes, electronics, aerospace and defense products, hazardous
chemicals, and pharmaceuticals—where it remained because of security and strategic concerns, social reasons, safety and environmental issues, and controls on hazardous nature products. The special permission needed for investment by the so-called “large houses” was also eliminated. Abolition of these controls gave India’s industry much greater freedom and flexibility to expand existing capacity or to establish new units (Bajpai 2002).

Industrial reforms generated productivity growth by removing the shackles on the private sector. The IT sector’s tremendous successes illustrate the positive impact of deregulation, with reforms in telecommunications clearing the way for the huge expansion that has followed. The reforms in the 1990s generated a wave of business confidence and entrepreneurial optimism, which, in turn, improved the competitiveness of the entire corporate sector, powered a resurgence in manufacturing, and accelerated the rate of investment.

Financial Sector Reforms
India’s financial system previously suffered weaknesses brought about by state ownership, rapid expansion, externally induced constraints on bank profitability, an overregulated interest rate regime, and internal organizational deficiencies (Bajpai 2002). Then, the government’s financial reform package in the 1990s established a policy regime for private nonbanking finance companies as well as agencies to rate their creditworthiness (Kapila 2007a). The Securities and Exchange Board of India was statutorily empowered in 1992, and quickly moved to improve standards of disclosure and transparency. It seeks to control insider trading, regulate large acquisition of shares, and improve trading practices in stock exchanges (Bajpai 2002). The very high statutory liquidity requirements through which banks were previously compelled to invest in government securities were reduced. Interest rates on money market instruments were freed.

India’s central bank, RBI, now prescribes only one ceiling rate on term deposits. Reform has focused on making the country’s organized capital markets more efficient. Institutions and forums have been created to help develop trade in money and long-term debt markets. A strong prudential regime has been put in place to govern the bank’s capital adequacy, income recognition, loan loss provisions, and transparency of accounts. Profitable banks have been permitted to access the capital market to augment their capital (Bajpai 2002).

Furthermore, RBI has moved from microregulation of credit to micromanagement. To enhance competition, many new private banks have been allowed to enter the market, including some foreign institutions. The reforms have accorded the banks greater flexibility to determine both the volume and terms of lending.

A new national stock exchange using electronic trading was established in 1993, setting high technical and governance standards, which the Bombay Stock Exchange soon had to emulate. Online trading and dematerialized trading were introduced. The government enacted depositories legislation, and paperless trading soon became the norm. These and other reforms have transformed India’s capital market into “one of the best in the developing world” (Acharya 2007), comparable in quality to those in many developed economies.

India’s liberalized capital markets have grown phenomenally in terms of capital raised, listed companies, trading volumes, market capitalization, and investor

18 Large industrial conglomerates.
base. The market capitalization of companies listed on the Bombay Stock Exchange rose nearly fourteenfold from $50 billion in 1990/91 to $680 billion in 2005/06 (Acharya 2007). The number and diversity of market intermediaries have grown rapidly. Foreign institutional investors have been permitted to invest in the Indian market. Companies have been allowed to buy back their own shares, subject to Securities and Exchange Board regulations.

Although India’s corporate sector raises a large part of its financial requirements through bank loans, it has relied increasingly on both the debt and equity markets. Despite policy hurdles, which are still receiving attention, venture capital in India is starting to grow, and it is particularly important for IT start-ups. The government-sponsored National Venture Fund for Software and IT Industry was launched in December 1999. The states of Andhra Pradesh, Gujarat, Karnataka, Kerala, and Tamil Nadu have set up venture funds of their own. Venture capital funding in India’s IT sector grew from $80 million in 1997/98 to $500 million just 2 years later.

The government has emphasized investor protection in its reforms, taking steps to make capital markets more efficient, transparent, liberal, and investor-friendly—including, of course, the establishment of the Securities and Exchange Board as a watchdog and regulator. RBI took action to strengthen accounting and disclosure requirements to enforce greater market discipline. As expected, the improved transparency has made the capital markets more attractive to investors.

**Divestment and Privatization**

India once had a very strong public sector—along with the growth problems that often accompany this particular economic condition. The government was the dominant owner in such key sectors as banking, energy, and transport, and the usual shortcomings of public ownership afflicted the performance of many of its enterprises. Public sector dominance and extensive government control over private sector activity handicapped competition in the economy.

This has now changed, although the divestment process has evolved over the years since the reforms began. In the early phase, the government concentrated on selective divestment of public sector equity with the aim of financing fiscal deficits. The government’s 1991 industrial policy statement saw the divestment of some government shareholdings in identified public sector undertakings (PSUs) to provide financial discipline and to improve their performance. In the 1991/92 budget, the government outlined its divestment goals as raising resources, encouraging wider public participation, and promoting greater accountability. Up to 20% of government equity in 31 selected enterprises was offered to mutual funds, financial and investment institutions, workers, and the general public (Kapila 2007a). In August 1996, the Disinvestment Commission was created to take charge of a phased divestment process. First, part of the government equity in selected state-owned enterprises was divested, and the Department of Disinvestment was established to be responsible for matters related to divestment of central government equity in PSUs, implementation of divestment decisions, and recommendations of the Disinvestment Commission. This department eventually became the Department of Privatization.

---

19 A distinction needs to be made between divestment and privatization. In India’s context, privatization often means opening up certain sectors for private sector participation rather than outright privatization of state-owned enterprises.
The divestment process began in 1991 with the sale of minority shares of selected PSUs in the market, and from 1991 to 1999 revenues from the sales of PSUs' shares reached Rs1,864 billion (Kapila 2007a). The policy changed in 2000 when the government began emphasizing strategic sales\(^\text{20}\) of identified PSUs. Experience seems to show that the strategic sale process discovers the fundamental, long-term value of the company better than the sale of small lots of shares (Kapila 2007a).

Privatization and disinvestment not only reduced fiscal deficits but also opened space in the economy for competition. The private sector was able to operate in areas once reserved for the public sector, which, while it might continue to play the dominant role for the foreseeable future, was forced to compete with the private sector. When reforms began, 18 industries were reserved exclusively for the public sector. This list has now been pruned to six, including such industries as arms and ammunition, atomic energy, mineral oils, atomic minerals, and railway transport. By reducing its entrepreneurial role, the government was both yielding economic space to the private sector and redefining the role of the state. Liberalization unleashed flows of domestic and foreign private investment into many key economic areas: steel; telecommunications; electricity generation; petroleum exploration, development, and refining; coal mining; and air transport (Bajpai 2002).

**Protection of Small-Scale Enterprises**

India was the first developing country to display concern and provide support for micro and small enterprises (MSEs), pioneering these efforts long before they became fashionable (Kapila 2007a). All government industrial policy statements since India's independence have paid special attention to the problems of these enterprises, reflecting a belief in their importance for job creation. The support has focused excessively on particular small-scale industries rather than MSEs in general. This is the result of a policy that reserves the production of certain items for MSEs and provides fiscal concessions by way of low excise duties, preferential allocation of and subsidization of bank credit, extension of business services, and preferential procurement by the government.

The reservation policy is meant to protect MSEs by barring the entry of larger units into their reserved areas of business. It also prevents existing MSEs from expanding beyond a maximum permissible value of investment in plants and equipment and from benefiting from the economies of scale. The reservation policy started in 1967 and reached its height in 1984. It obviously entails efficiency losses and imposes costs on consumers, and the logic behind has been strongly questioned. Nonetheless, while the policy has been gradually relaxed, 239 items remained reserved for MSEs in 2007 (MOF 2007).

Anecdotal evidence suggests that MSEs have benefited from the much freer access to traded raw materials, components, and designs (Acharya 2007). Thus, MSEs are said to have been protected from the competition of large companies both through reservation and fiscal concessions. Interestingly, the policies favoring MSEs

\(^{20}\) Strategic sale is a sale of equity by the government where the management control of the entity is handed over to the strategic partner, who is typically required to purchase an equity stake that is large enough to ensure a workable majority.
were originally aimed at encouraging the manufacturing sector. They did not work, partly because their constraints on economies of scale contradict the principles of production. As observed by Kapila (2007a), small-scale reservations may have disadvantaged industry more than services.

IT MSEs, however, seem to have been successful. With small requirements for plants and machinery, they demand less investment than manufacturing. They are also more skill- than labor-intensive—truly small and micro in terms of employment. The economies of scale in IT—the leading sector in the so-called new economies—do not relate directly to the amount of investment or the number of employees, especially true of software. Moreover, constraints on economies of scale can be bypassed by clustering, which achieves some economies of scale and economies of scope through the operation of many IT enterprises in close proximity. Indeed, India’s software sector clearly shows clustering of software companies in three distinct areas. They include the southern states of Andhra Pradesh, where companies are confined to Hyderabad; Karnataka, clustered essentially in Bangalore; and Tamil Nadu, in the cities of Chennai, Coimbatore, Madurai, and Trichy. Clusters in the west are mainly in Mumbai and Pune in the state of Maharashtra. Delhi, Gurgaon, and Noida host the clusters in the north. The software companies in these regions account for almost all the software and services exports of the country, as well as most of the firms and employment in the sector (Bajpai 2002).

As previously mentioned, India’s IT triumphs may have resulted in part from the freedom from government control (Kapur 2002) the sector enjoyed in its early years and, to some extent, still benefits from today. In the 1980s, no license was needed to set up an IT company and even now it takes less time to win approval for an IT enterprise than for manufacturing, which also requires more electricity, water, roads, and other infrastructure. Manufacturing companies must have offices or plants to be registered; IT firms can be registered as home offices.

The Indian diaspora, particularly in the US, where the Indian community is long and successfully established, has created a valuable two-way flow of talent between the countries (Kapur and Ramamurti 2001). Some of India’s IT businesses actually began in California, where a business network was established, and then moved to register in India. India’s policy of recognizing dual citizenship de facto has also benefited the IT sector.

National Strategies

Some national strategies are needed to take advantage in global competition. This section presents three important strategies that India has used to successfully generate fast growth with a nationwide effect.

Low-Cost Strategy

India is a developing country and its comparative advantage is cheap labor. Its initial entry into the software business and its continued success have had a lot to do with its large supply of low-cost talent and relatively inexpensive IT skills. About 70% of software companies’ cost structure is composed of personnel costs (Khanna and Palepu 2004). Notwithstanding increasing competitive pressures, India remains an attractive source for these services due to its low cost of operations, high quality of product and
services, and availability of skilled manpower. IT activities require qualified English-speaking workers, which India has in abundance and can provide at comparatively advantageous prices.

India’s outstanding success in IT and ITESs reflects global competitiveness and the value put on a cheap but highly skilled workforce by the international market. India produces more engineers and scientists than any country in the world except the US. They are the source of India’s comparative advantage in at least some segments of IT and ITESs. Some observers conclude that while the PRC has a comparative advantage in manufacturing, India—because of this important asset—has an advantage in services.

**Second-Mover Strategy**

In a competitive world, some countries are able to take quick action to grasp an opportunity. Japan and the “Four Tigers” are classified as such first movers. It is accepted that first movers enjoy some advantages, but it should not be forgotten that second movers also have some advantages. At least the latter can avoid the mistakes committed by the former and take the next opportunity to find new way.

Like an elephant, India’s reaction was rather slow in international competition, and economic reform and openness came a little late. Because the country missed the boat, India’s entrepreneurs have had to wait for the next opportunity. Although it moved slowly in the past, the elephant now is smart enough to find a new way for fast growth.

**Blue Ocean Strategy**

In their bids to industrialize, most, if not all, developing countries have previously employed a strategy of following, catching up, and overtaking. India’s experience appears to be different—a “blue ocean strategy.”

Kim and Mauborgne’s book (2005) is based on a study of 150 strategic moves that spanned more than 30 industries over 100 years (1880–2000). The authors argued that tomorrow’s leading companies will succeed not by battling competitors but by making strategic moves that they call “value innovation.” It provides a grand design to create powerful leaps in value for both the firm and its buyers, unleashing new demand, thus rendering rivals obsolete. In fact, a blue ocean strategy is the simultaneous pursuit of differentiation and low cost.

The authors used the ocean as a metaphor to describe the competitive space in which a company chooses to swim. “Red oceans” refer to the frequently accessed market spaces where the products are well defined; competitors are known; and competition is based on price, product quality, and service. In other words, red oceans are an old paradigm that represents all the industries in existence today. In contrast, “blue oceans” denote environments where products are not yet well defined, competitors are not structured, and the market is relatively unknown. Companies that sail the blue ocean are those adept at beating the competition by focusing on developing compelling value innovations that create uncontested market space.

In the 1990s, Indian entrepreneurs found that exports of manufacturing goods from the PRC were flooding the world market, and such fierce competition turned the ocean red. If they moved to manufacturing, it would make overcompetition more severe. Fortunately, they happened to find that there was no real competitor in the area of services and that cheap Indian laborers with English and mathematical skills would be successful in services exports.
The aim of the blue ocean strategy is not to outperform the competition in the existing industry but to create new market space or a blue ocean, thereby making the competition irrelevant. This is precisely what Indian entrepreneurs have done in the new century and, so far, their strategy has been successful.

**Conclusion**

India has attained and maintained a new round of fast growth. During the Tenth Five Year Plan period, economic growth averaged 7.6% annually—the fastest pace of expansion in any plan period so far and significantly higher than that of 5.7% annually during the 1980s and 1990s. Annual growth in per capita income averaged 6.1% during the tenth plan period and 7.1% during the last 4 years (2003/04 to 2006/07), more than double the 3.4% annual average during the 1980s and 1990s. After having exceeded 10% GDP growth in the second quarter of 2006/07, the economy appears to be stabilizing at a rate above 8.5% and close to 9.0%. Indeed, the fiscal period 2003/04–2007/08 has perhaps been the best 5-year economic performance in the history of independent India (MOF 2008).

The outlook is equally—if not more—bright. Macroeconomic fundamentals continue to inspire confidence, and the investment climate is full of optimism. Available information indicates that the momentum of growth will continue and that the impulses of growth will become broad-based. Steady increases in savings and investment rates and in consumption demand—as well as the addition of new capacity and the more intensive, efficient utilization and capitalization of existing capacity—are all expected to provide support for growth in the foreseeable future. With a 4-year 8% average already achieved and 2006 likely to register a similar rate, the Planning Commission (2006) outlined GDP growth projections for 2008/09–2011/12 of 8% to 9%. Bhalla (2007) goes further and foresees 10% growth as almost inevitable. The majority of economists in India today would probably expect economic growth in the medium term, say, 2007/08–2011/12, to average 8% on a sustained basis, provided that appropriate policies and environments are put in place. India is taking off—or has already done so.

India’s growth and development have provided valuable experience for other countries and have contributed to development economics. Its experience has proven that this new century will offer great new opportunities, and second movers will have their chance. It is important that they use their advantages and avoid being restrained by their disadvantages. The key here is to be ready and, when opportunity comes, to seize it.

Government can play a role in a takeoff, but market mechanisms are important. Some of Asia’s economic takeoffs were government-led, but India’s experience proves that a takeoff can be driven by the private sector. Structural reforms were implemented by successive governments in India over the past 2 decades. Government intervention was reduced. Competition was encouraged. The economy was opened up and transformed from looking inward to an outward view and a global perspective. Entrepreneurs now have more power and space to make their production and investment decisions, based on market conditions. India’s entrepreneurs have played a very important role in their country’s takeoff.

It is wise for developing countries to have a particular sector lead and serve as an engine of growth. This engine should ideally be built on a country’s comparative advantages so that it can last a long time. With more than 1 billion people and a
strong education system, India’s comparative advantage is cheap, skilled labor. Indian professional training and higher education produced an abundance of IT professionals and it is their comparatively inexpensive IT and math skills that make Indian software competitive in the world market. It is clear that the IT sector has played the leading role in the new round of growth and has driven other sectors to develop through its vertical and horizontal spillovers. IT and ITESs, for example, have helped the services industry grow rapidly. There is also some evidence to suggest that this momentum is now spreading to the manufacturing sector.

To take off, most Asian developing countries have employed favorable treatment to attract foreign investment. However, India gives FDI national treatment instead of favorable treatment. In so doing, it manages to have both FDI and sovereignty.
References


The Experience of India’s Software and Information Technology-Enabled Service Industries

Jiang Qiping

This paper presents the achievements of India’s software and information technology-enabled service industries; reviews the history of the shift in these industries from comparative advantages to competitive advantages; and analyzes three key competitive factors, including the selection of markets, existence of related and supporting industries and corporate strategies, and market structure and competition. It states that competitive advantages are more important than comparative advantages if a developing country is to realize accelerated development through the international division of labor. It identifies eight lessons from India’s experience for other developing countries in achieving accelerated development.

Basic Achievements of India’s Information Technology–Software Industry

Contribution of India’s Information Technology–Software Industry to the National Economy

India’s information technology (IT)–software industry has experienced phenomenal growth in recent years. Revenues grew more than tenfold from $4.8 billion in fiscal year (FY) 1998 to $64 billion in FY2008, and are predicted to reach $72 billion in FY2009—equivalent to almost 6% of gross domestic product (GDP). Exports have accounted for most of the industry’s revenues since FY2001. The gap between revenues from the domestic market and from exports has continued to widen as exports have increased by an average of 32% annually from FY2004 to FY2008. In FY2008, the IT–software industry’s exports were valued at $40.9 billion—equivalent to 16.4% of total merchandise and services exports, and 3.8% of GDP—and they are expected to reach $47 billion in FY2009 (Figure 1).

---

1 Secretary-General, Center for Informatization Study, Chinese Academy of Social Sciences, Beijing.
2 India’s software and information technology-enabled service industries include IT services, IT research and development and software products, and IT-enabled services and business process outsourcing. Henceforth, these are jointly referred to as the IT–software industry.
3 Abstract from the statistics of the Government of India, except where otherwise stated, including annual national statistics, and those of the Ministry of Communications and Information Technology.
Most of the IT industry’s revenues are from software and services—including IT services, engineering services, research and development, and business process outsourcing (BPO). In FY2008, software and services achieved revenues of $52 billion, while revenues from IT hardware were only $12 billion. In FY2009, it is estimated that software and services revenues will increase by $7.6 billion, but IT hardware revenues will increase only minimally (Table 1).

Employment of knowledge professionals in India’s IT–software industry reached over 2 million in FY2008, a seven-fold increase from the 284,000 employed in FY2000 (Figure 1). In FY2008, IT, engineering and research and development (R&D), and software exports accounted for 43% of employment in the industry, while BPO exports accounted for 35% and the domestic market accounted for 22%. From FY2004 to FY2008, employment in the IT industry grew by an average of 25% annually.

**India’s Software Exports and Business Process Outsourcing of Information Technology-Enabled Services**

Software and services have become one of main pillars of India’s IT industry, accounting for most of its exports. Revenues have increased from $17.7 billion in FY2005 to $40.9 billion in FY2008, and are predicted to reach $47 billion in FY2009. In particular, exports of IT services grew from $10 billion in FY2005 to $23.1 billion...
in FY2008 (Table 1). Exports of engineering services, R&D, and software products, on the other hand, contributed $6.4 billion in FY2008. The United States (US) continues to be India’s most important market for software exports; however, the share of exports to the US started to decline in FY2006–FY2008, while Europe’s share increased (Table 2).

Although India’s IT-software industry and that of the People’s Republic of China (PRC) are of similar size, in exports, India ranks second only to the US and it is far ahead of the PRC. This is one of the outstanding achievements of India’s economic development. Table 3 shows the very rapid growth in output value of the software industry in India and the more steady increase in the PRC. In 2005, employment in the IT industry in the PRC was about 30% lower than in India, whereas the US is the world leader by a large margin (Figure 2).

### Table 1: Revenues of India’s Information Technology Industry, Fiscal Years 2005–2009 ($ billion)

<table>
<thead>
<tr>
<th>Item</th>
<th>FY2005</th>
<th>FY2006</th>
<th>FY2007</th>
<th>FY2008</th>
<th>FY2009e</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT services</td>
<td>13.5</td>
<td>17.8</td>
<td>23.6</td>
<td>31.0</td>
<td>35.2</td>
</tr>
<tr>
<td>Exports</td>
<td>10.0</td>
<td>13.3</td>
<td>17.8</td>
<td>23.1</td>
<td>26.9</td>
</tr>
<tr>
<td>Domestic</td>
<td>3.5</td>
<td>4.5</td>
<td>5.5</td>
<td>7.9</td>
<td>8.3</td>
</tr>
<tr>
<td>Engineering services and R&amp;D, software products</td>
<td>3.8</td>
<td>5.3</td>
<td>6.5</td>
<td>8.6</td>
<td>9.5</td>
</tr>
<tr>
<td>Exports</td>
<td>3.1</td>
<td>4.0</td>
<td>4.9</td>
<td>6.4</td>
<td>7.3</td>
</tr>
<tr>
<td>Domestic</td>
<td>0.7</td>
<td>1.3</td>
<td>1.6</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>ITES-BPO</td>
<td>5.2</td>
<td>7.2</td>
<td>9.5</td>
<td>12.5</td>
<td>14.8</td>
</tr>
<tr>
<td>Exports</td>
<td>4.6</td>
<td>6.3</td>
<td>8.4</td>
<td>10.9</td>
<td>12.8</td>
</tr>
<tr>
<td>Domestic</td>
<td>0.6</td>
<td>0.9</td>
<td>1.1</td>
<td>1.6</td>
<td>1.9</td>
</tr>
<tr>
<td>Total software and services revenues</td>
<td>22.5</td>
<td>30.3</td>
<td>39.3</td>
<td>52.0</td>
<td>59.6</td>
</tr>
<tr>
<td>Exports</td>
<td>17.7</td>
<td>23.6</td>
<td>31.1</td>
<td>40.4</td>
<td>47.0</td>
</tr>
<tr>
<td>Domestic</td>
<td>4.8</td>
<td>6.7</td>
<td>8.2</td>
<td>11.6</td>
<td>12.6</td>
</tr>
<tr>
<td>Hardware</td>
<td>5.6</td>
<td>7.1</td>
<td>8.5</td>
<td>12.0</td>
<td>12.1</td>
</tr>
<tr>
<td>Exports</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Domestic</td>
<td>5.1</td>
<td>6.5</td>
<td>8.0</td>
<td>11.5</td>
<td>11.8</td>
</tr>
<tr>
<td>Total IT industry (including hardware)</td>
<td>28.1</td>
<td>37.4</td>
<td>47.8</td>
<td>64.0</td>
<td>71.7</td>
</tr>
<tr>
<td>Exports</td>
<td>18.2</td>
<td>24.2</td>
<td>31.6</td>
<td>40.9</td>
<td>47.3</td>
</tr>
<tr>
<td>Domestic</td>
<td>9.9</td>
<td>13.2</td>
<td>16.2</td>
<td>23.1</td>
<td>24.4</td>
</tr>
</tbody>
</table>

BPO = business process outsourcing, e = estimated figures, ITES = information technology-enabled service, IT = information technology, R&D = research and development.

Table 2: Export Structure of India’s Software Industry, Fiscal Years 2005–2008 (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>68.3</td>
<td>67.2</td>
<td>61.4</td>
<td>60.0</td>
</tr>
<tr>
<td>Europe</td>
<td>23.1</td>
<td>25.1</td>
<td>30.1</td>
<td>31.0</td>
</tr>
<tr>
<td>Other parts of world</td>
<td>8.6</td>
<td>7.7</td>
<td>8.5</td>
<td>9.0</td>
</tr>
</tbody>
</table>


Table 3: Output of Software Industry of the People’s Republic of China and India in the Late 1990s ($ billion)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output value</td>
<td>0.8</td>
<td>1.4</td>
<td>1.7</td>
<td>2.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Growth rate of output value %</td>
<td>—</td>
<td>65.9</td>
<td>22.9</td>
<td>50.6</td>
<td>80.0</td>
</tr>
<tr>
<td>PRC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output value</td>
<td>1.3</td>
<td>1.8</td>
<td>2.5</td>
<td>3.1</td>
<td>3.9</td>
</tr>
<tr>
<td>Growth rate of output value %</td>
<td>—</td>
<td>32.7</td>
<td>46.8</td>
<td>31.0</td>
<td>26.4</td>
</tr>
</tbody>
</table>

— = not applicable, PRC = People’s Republic of China.
Sources: Zhou 2003; China Jingji Publishing House n.d.

Figure 2: Employment in the Software Industry of the Four Leading Countries, 2005 ('000)

India continues to be a leader in the field of outsourcing. India’s revenue from information technology-enabled services–BPO (ITES–BPO) has more than doubled, from $5.2 billion in FY2005 to $12.5 billion in FY2008, and is expected to reach $14.8 billion in FY2009. In FY2008, exports accounted for almost 90% of ITES–BPO revenues (Table 1). India accounted for over 40% of global IT outsourcing services in 2008 (NASSCOM-Everest Group 2008). Well-known enterprises such as Wipro, Tata Consultancy Services, and Infosys have grown at least as rapidly as the outsourcing market. In 2007, these corporations had a market capitalization of more than $20 billion, though only a decade earlier none was listed (Underhill and Overdorf 2007).

**New Trends in India’s Information Technology Industry**

Five new developments can be identified in India’s evolving IT industry:

(i) The outsourcing of India’s IT service industry is evolving. Due to the pressures of service updates and higher costs, India’s IT service outsourcing is now being divided into two parts: indigenous outsourcing, which is shifting to high-end services; and subcontracting of outsourcing services of low-value to other regions, including the PRC.

(ii) Priority policy support from the government has helped accelerate the growth of India’s hardware manufacturing industry. The government has launched many preferential policies to support hardware manufacturing, similar to previous policies to support the software industry, with the aim of leveraging the low-cost advantages of India. However, infrastructure gaps persist.

(iii) The domestic market is developing continually. At present, India’s IT application market still largely lags behind the export market. However, this situation is changing due to India’s plans to improve overall “informatization”\(^4\) since 2008, and many applications are being popularized. eINDIA 2007\(^5\) targets seven fields that are expected to have decisive impacts on future development, and promotes the application of information and communications technology for development (ICT4D).

(iv) The use of mobile phones has developed rapidly in India, and mobile phone services now feature next-generation technology. At present, the focus is on low-cost mobile telephone services, application of new technologies to achieve development targets, infusion of new technologies such as Web 2.0, expansion of mobile coverage of mobile phone technology for rural development, and use of solar energy and green technology particularly in remote areas.

(v) The popularization of e-governance is accelerating. India’s policy making has treated e-governance as a key field of informatization and has attached to it the same importance as the software service industry.

---

\(^4\) Informatization is the process—driven by electronics and information technology—through which a traditional industrial society becomes an information industrial society.

\(^5\) eINDIA 2007 is an inclusive, consultative, and constructive forum for the development of information and communications technology.
Evaluating the Achievements of India’s Information Technology–Software Industry

The International Data Corporation predicts that by 2011, the market scale for IT industry outsourcing services worldwide will increase to $37.8 billion at growth rates of over 100% from 2006. Currently, 55 countries, including, Brazil, Poland, and Viet Nam are promoting themselves to multinational corporations as remote service locations; however, none of these new competitors can hinder the growth of India (Underhill and Overdorf 2007).

Why is India dominant in this area? This is a persistent question for those who have witnessed the achievements of India’s IT–software industry. In the author’s opinion, the achievements center on the comparative advantages derived from gift and the optimal selection of markets and products by enterprises, society, and the government.

Gift and Selection: The Difference between Comparative and Competitive Advantages

Before discussing in detail the factors behind the success of India’s IT–software industry, it is necessary to explain what is meant by selection and gift and describe their interrelationship. Gift refers to both the initial conditions in a country, and a country’s natural comparative advantages that cannot be transplanted or learned from experience. It mainly refers to factor endowment, i.e., the relative ratios of natural resources, labor, and capital in an economy. Selection refers to people’s choices and realization of intention. It represents personal efforts and other factors that generate a country’s competitive advantage; in particular, the market conditions, related and supporting industries, and company strategy, structure, and competition (Underhill and Overdorf 2007).

It is important to differentiate selection and gift because, although both are indicators of success, selection can be learned while gift cannot. Gift represents intrinsic and natural factors, which can shape a country’s comparative advantages. Selection represents personal efforts, policy, and other factors that generate a country’s competitive advantages. The priority question, therefore, is whether comparative advantages are more important than competitive advantages.

According to the traditional theory of comparative advantage, in the early stage of development of a country or region, factor endowment is characterized by an acute lack of capital. Under such condition, a development strategy that places a priority on capital-intensive industries can be implemented by the selective injection of limited capital into a few industries. As a side effect of this policy, other industries will not meet their minimum capital needs. The industries that receive support can then grow at distorted prices under the protection policies of the state while lacking in any competitive edge (Li 1999).

However, developments that have occurred in India and the PRC violate the traditional theory of comparative advantage. India’s IT–software industry and the PRC’s manufacturing industry have achieved competitive advantages worldwide while avoiding the lack of competitive edge that the theory of comparative advantage considers inevitable. This reality requires us to integrate the theory of competitive advantage into our research. Competitive advantage theory, formulated by Michael E. Porter,
postulates the opposite of the theory of comparative advantage and is not merely a
term describing status. According to Porter (1990 and 1999) the competitive edge
of a country often comes from the input of material gifts, including labor, natural
resources, and financial capital; however, the advantages provided by these input
factors decrease as globalization advances. The country should therefore create a
favorable environment that will ensure efficient use of input factors and encourage
innovation. We concur with these ideas.

In their research on India’s IT–software industry, PRC scholars all acknowledge
that competitive advantages have played a more important role than comparative
advantages in India’s success. In other words, national efforts and acquired fac-
tors are more important to India’s success in this field than intrinsic and natural
factors.

PRC scholars also widely hold that India’s investments in material capital, human
resources, and the establishment of technical capability changed the factor gift of
the country, generated competitive advantages, and set up a new industry that has
been able to be highly competitive internationally (Li n.d.). India fully leveraged the
comparative advantages of its production factors, took advantage of the international
market, and expanded its activities internationally to transform its comparative advan-
tages into genuine competitive advantages (Dai 2006).

More specifically, the success of India’s IT–software industry is most likely
related to its comparative advantage in software development for personal computers.
However, the ultimate reasons why it has been able to surpass Europe, Japan, and
other developed countries in a technologically intensive and highly competitive industry are India’s innovation in systems management and technology in the development of its software industry, and its strategy for internationalization and the creation of its own competitive advantage. These factors have transformed potential advantages into realities (Dai 2006).

Other countries that enjoy similar resource factors and gifts have been less suc-
cessful than the PRC, India, and the US in developing the information industries that would best suit their factor endowments, because the comparative advantage of factor endowment is not the only reason for the success in the IT industry. Countries that lack competitive advantages will find that their products cannot compete in the international market, and thus comparative advantages cannot be realized (Liao and Wang 2003). The IT–software industry in countries such as India has succeeded where other countries with similar comparative advantages have failed (Yan 2005).

Analysis of Competitive Advantages of India’s Information
Technology–Software Industry

According to conventional wisdom, India’s IT–software industry has achieved success
on account of its advantageous time zone and the English language skills of its work-
ers. Although these factors indeed play a decisive role in the success of the industry, they are not the main focus of this research because neither the geographical location of a country nor the intellect of its population can be transplanted. However, subjective factors that are independent of the objective conditions responsible for India’s success can be identified. These include leadership, and the identification, selection, and utilization of opportunities. The quality of leadership determines whether different countries with the same conditions will perform excellently or unsatisfactorily. Analysis
of India’s experience is expected to generate findings that will be applicable to Asian countries with different conditions and will help develop a competitive edge.

This paper, therefore, focuses on India’s experience with selection. The author believes that the importance and priority of selection surpasses that of gift, and the role of competitive advantages exceeds that of comparative advantages regardless of its role in the success of a particular industry.

Recognition is given to the decisive role of India’s entrepreneurs in realizing their success in the IT–software industry, and also to the primary role of entrepreneurs—rather than the government—in the industry’s success of (a view held by many Indian scholars). However, the influence of the entrepreneurial class is not the subject of study of this paper. This does not mean there is any material difference between Indian and PRC scholars: our literature survey has found that most PRC scholars attribute the development of the IT industry to the government, although they do not underplay the important role of India’s entrepreneurs. Rather, the purpose of this research is to uncover the role of the Government of India in order to derive lessons that can be applied in the PRC and other developing countries in Asia.

In the future, a country’s competitive advantage will be determined to a large extent by technological ability (Cui et al. 2004). Questions such as how India located opportunities and grasped key ideas, and what can be distilled from this experience, need to be answered to help countries gain a competitive edge in next-generation technologies.

The extent to which technology and the economy are integrated has become one of the key indices for judging the overall strength of a country’s economy. How should a country select an effective technology development strategy, and how can key development fields be identified are primary questions faced by the governments of many countries (Cui et al. 2004). How was India able to seize the opportunity presented by structural changes in the international division of labor, and how was it able to benefit from globalization? Answers gleaned from a study of India’s IT–software industry can provide valuable guidance for other developing countries.

India and other developing countries in Asia began to develop their IT industry from the same baseline of initial conditions. Now India is at an advanced stage in which it is developing a high value-added IT service industry. The rapid development of India’s IT–software industry began in FY1998, when the industry realized a very high growth rate of 80%, abruptly surpassing the PRC in total output and subsequently maintaining the lead. Our research covers 1997–2007; the preceding period is used as the baseline.

In summary, the major issues are (i) what are the roles of selection and gift in the development of India’s high-end software industry?, and (ii) what can other Asian countries learn from India to maximize their gift and enhance their production capability to accelerate the development of their own IT industry?

Review of the Development of India’s Information Technology–Software Industry and Analysis of the History of Advantages

In terms of the influence of comparative advantages and competitive advantages, the development of India’s IT–software industry can be divided into three stages. In
the first stage (1970–1984), comparative advantages prevailed; in the second stage (1985–1997), comparative advantages and competitive advantages coexisted; and in the third stage (1998 to present), competitive advantages prevail. This division is similar to the development stages of India’s software enterprises noted by AnnaLee Saxenian (2001). In Saxenian’s characterization, the industry’s development can be divided into three phases: the first stage precedes 1984, the second and key stage spans 1984–1990, and the third stage is from 1990 to present.

Stage One: Initial Conditions and Spontaneous Selection, 1970–1984

From 1970 to the mid-1980s, India’s software industry was at the stage where selection and gift determination were spontaneous. India had not developed its software industry for the purpose of expanding its production possibility frontier, nor had it recognized that the software industry offered higher profits than manufacturing and was therefore more worthy of selection.

Passive Selection by Enterprises in the Early Stage

First, the relationship between selection and gift in the choice of the development path of India’s software industry during its early stage will be reviewed. India’s software industry has been export oriented from its inception. This contrasts with the route taken by the PRC, where software development was boosted to supply the domestic market. However, this was not due to any identification of opportunities by the government. Throughout the 1970s, the government played a merely supervisory role over the private sector, personal computer products, and service producers (Evans 1992).

At the end of the 1970s, India launched a policy of exporting software in exchange for hardware. As a result, Wipro, Hindustan Computers, and other enterprises developed software exports to trade for import licenses for hardware production equipment, parts, and foreign credit lines on demand. On the other hand, the cost advantages offered by India’s enterprises in low-end markets had stabilized (Liu 2005). In this case, gift clearly played a decisive role. India’s accomplishments were due to passive selection, i.e., the selection of simple adaptation to initial endowment conditions (e.g., low wages). In the early stage, the industry did not aim to upgrade or enhance value added, and instead geared its exports toward obtaining imports of needed goods rather than catering to global demand.

The Government of India had no Definite Role in Selection in the Early Stage

Although the Government of India now attaches high importance to the development of the IT sector, prior to the Seventh Five Year Plan, it was not orientated toward the global market; therefore, the selection consciousness of the government was not evident and there is no clear distinction in IT sector development between hardware and software. Without the consciousness of globalization, accelerated development never occurs.

Generally speaking, during 1970–1984, India’s software industry developed within a rigid control regime that emphasized self-sufficiency and import substitution—a political system that suppressed the talents of entrepreneurs and isolated India from the global economy.
Stage Two: Combination of Enterprise, Government Selection and Comparative Advantages, and Forming of Competitive Advantages, 1985–1997

The period from 1985 to 1997—which encompassed the Seventh and Eighth Five Year Plans—was the time when India’s software and IT-enabled service industry took shape. The main feature of this period was the development of the software industry in a manner that largely relied on gift. The combination of gift and active selection by the entrepreneurial class and the government produced competitive advantages, i.e., competitive advantages were created by a combination of natural factors, policy, and entrepreneurship.6

The launching in 1986 of the Computer Software Export, Development, and Training Policy indicated that India’s software industry had formally rejected the idea of import substitution for manufacturing and self-sufficiency. This policy helped to expand software exports and facilitated the importation of materials required to produce export

6 India’s software industry developed independently in the mid-1980s with no government support. However, with the development of software enterprises, the government subsequently launched more preferential policies to meet their needs. The computer policies launched by Rajiv Gandhi’s new government in 1984 treated software as an independent industry for the first time and reduced the income tax of software-exporting corporations. At about the same time, the top association of the industry—National Association of Software and Services Companies (NASSCOM)—was set up with the support of consortia and government (Veloso et al. 2004).
products. At the same time, the government allowed foreign accompanies to form joint ventures with India’s entrepreneurs to gain access to domestic markets. The exports of firms in export processing areas enjoyed a generous subsidy. As a result, software became one of first liberalized sectors of the economy as part of the policy-liberalization legislation announced in the mid-1980s (Bajpai and Shastri 1998).

Policy reform in the 1990s stimulated the development of the export-oriented software industry in India. The main feature of this policy was the cancellation of the import license system for industrial equipment and the establishment of software technology parks. The model of product development for export employed by India’s programmers was fully developed after these reforms.

Research on India’s experiences during this period raises two main questions: Why did India’s IT industry select the software industry instead of the manufacturing industry? And why did India’s software industry select the export-oriented model instead of the self-sufficiency one? These two questions actually refer to the same issue: did the gift-determined IT industry of India subconsciously or consciously select an export-oriented software industry?

The obvious contradiction is as follows: any country in the early stage of development should naturally select low-end markets and low-end industries according to its factor gift. Why did India consciously or subconsciously select a high-end industry and market?

In our opinion, part of the answer to this question is that the development of India’s IT industry in this period cannot be completely interpreted by factor gifts and must be understood in light of the role of people—including enterprises and the government—in selection.

Factors Contributing to the Development of India’s Software Services

It is self-evident that the success of India’s software services stems from endowment factors. Typical case study teaching materials reveal similar viewpoints:

- Although the general level of education is low, the bulk of the middle class in India is well educated. Education at top Indian institutions is world-class. Moreover, India has always attached importance to engineering.
- By the end of 2005, emigration of technicians from India reached nearly 600,000 people, including 4,000 top scholars. Around 80% of graduates of the six most well-known universities of science and technology in India emigrated to the US (Desai, Kapur, and McHale 2003) (Box 1).
- English—a vestige of British colonial rule—has become the working language of most of the middle class in India. Some Indian scholars hold that “numerous English-educated talents shape a natural advantage, which endows India with an unmatchable human resource advantage unavailable in other countries” (Vittal and Mahalingam 2004).
- The US has an acute shortage of software engineers although the basic wage is among the highest of all professional groups, and new programmers enjoy an annual wage of up to $70,000. However, new programmers in India have an annual wage of $5,000, which is extremely low by international standards although very high in India. A comparison of hourly wages for IT employees in the US and India is given in Table 5.
- High-quality management.
Other influential, though sometimes disputed, factors include:

- A favorable time zone, which enables Indians to work when Americans are resting (although this does not hold true for the Japanese).
- Mature skills. (However a contradictory viewpoint claims that few achievements are made in India's manufacturing industries due to a lack of mature skills.)
- Good infrastructure for the development of the software industry, such as favorable communication, infrastructure, and facilities. (Contrary viewpoints hold that the country's infrastructure is too poor to develop a manufacturing industry.)

In summary, during the Seventh and Eighth Five Year Plans, advantages included wage cost, language, and education; whereas the country's infrastructure, the lack of foreign direct investment, and the extensive use of permits and/or licenses for business activities were notable disadvantages.

**Perception and Selection by India’s Enterprises**

Many Indian scholars hold that the Government of India rarely manages enterprises well and that the success of India’s software services is the result of the spontaneity of entrepreneurs. Scholars familiar with the workings of the government think that the growth of India IT–software industry should initially be credited to the spontaneous market action of entrepreneurs, rather than the intended design of the government, and that the government boosted the development of the software industry only after having observed its potential. These scholars view the entrepreneurial class as the main driver of India’s IT–software industry. Three aspects of this viewpoint will
be analyzed: (i) the extent to which gift factors drive India’s entrepreneurs to enter the software industry, (ii) how these entrepreneurs found out about the opportunities enabled by globalization and industrial restructuring, and (iii) how they actively selected the international IT–software industry.

Some well-established software enterprises, such as Tata Consultancy Services (incorporated in 1974), began to be involved in the software industry during the period of the planned economy. For this company, the pursuit of a preset path was the reason to continue their business in the software industry. Besides the already established companies, we can identify three categories of enterprise: senior IT corporations shifting from hardware to software, such as Wipro (Box 2); software corporations newly incorporated before and after the issuance of favorable software policies, such as Infosys; and foreign-funded enterprises engaged in software production, such as Motorola (India) Electronics Limited.

For the well-established corporations, one cannot draw a definite conclusion that the gift factors in India’s market were key elements determining their selection between the manufacturing industry and the software industry. In the case of Wipro, Azim Premji—the company’s chairman—initially selected the manufacturing industry and achieved considerable success. He left manufacturing when industrial policy was liberated in 1991, rather than because of any gift-related change.

Why did India’s enterprises select the software industry instead of the IT manufacturing industry? The answer is clearly that the selection was determined by different factor endowments. However, this conclusion now increasingly raises doubts, especially given that since 2006, India has once again set a target of reviving its IT manufacturing industry. In the light of this new development, we need to reexamine the viewpoint that India’s factor endowment is not suitable for developing the IT manufacturing industry.

Wipro’s selection of the software industry instead of other hardware industries it had engaged in before—such as medical equipment—obviously reflects judgment and selection of industrial trends. Wipro has ceaselessly exploited its contacts in Silicon Valley, and identified and grasped the opportunities.

For software corporations newly incorporated before or after the issuance of favorable software policies—such as Infosys—the role of gift in the initial selection of the industrial path is still a question since favorable gift factors, such as cost; and unfavorable factors, such as infrastructure, both coexisted. The infrastructure only improved later, to say nothing of the difficulty of initiating a software corporation. In 1981, Narayan Murthy—the founder of Infosys—famously waited a year for the installation of one telephone line, and went to New Delhi 15 times in order to win approval for the import of one $15,000 computer.

Infosys’s choice of the software industry was mainly based on its identification of opportunities. The choice of software service rather than the hardware industry can be explained by an awareness of potential demand, specifically demand from overseas markets. This key role is attributable to the “superior consciousness” (Liu 2005) acquired by its founder Narayan Murthy during his time working in the West. Such foresight and judgment formed the necessary conditions to achieve accelerated development. Several “firsts” achieved by Infosys in India further demonstrate the wisdom of the selection made by Mr. Murthy: Infosys was one of the first personal software service providers, the first software firm listed in India, the first Indian high-tech firm listed on the NASDAQ stock exchange in the US, the first Indian firm granting
The Government of India passed a series of laws in 1977 that allowed foreign-funded firms to operate in India only through native companies or branches operated by Indians. As a result, IBM, a leading computer firm, had to leave India's market. “When IBM left, we were faced with a gap, so we decided to concentrate on the IT industry,” said Azim Premji, chairman of Wipro. Within a year, Wipro started to export microcomputers, which were successfully developed by India for the first time and could run without utility programs. Then Wipro proceeded to expand its personal computer market and soon became the biggest computer firm in India, with advanced technology and excellent customer services.

But the good times did not last. In 1991, the government liberalized industrial licensing policy, and opened India's computer market to the world's leading computer firms. Wipro then was faced with many difficulties since those world-class brands had more powerful research and development teams, and tremendous sales achievements. They could also produce more powerful computers sustainably and at a lower price than could native computer manufacturers like Wipro.

In response, Wipro set its sights, first, on software programming design with built-in utility programs for telecommunication facilities and computers. In 1995, Wipro was certified by the International Organization for Standardization (ISO), and in 1999, the company became the first software service provider in the world qualified with a Grade 5 Capability Maturity Model Integration for software.

Long-time Wipro director, Subroto Bagchi recalled the difficult period during which Wipro managed to win a position in Silicon Valley: first he had to apply to the Delhi government for a license for a foreign exchange business, and was allowed to change only $10,000 to cover all expenses for the first year. Then, without a fixed base, Wipro started to explore the United States to expand the market. It tried to get help from technicians there—usually Indians they got to know at companies such as Intel, Seagate, and Sun Microsystems.

Wipro's most successful breakthrough was its cooperation with General Electric. “This was a big deal since it helped promote the reputation of Wipro,” said Banerjee, who was in command of software development at Wipro and who built the important alliance of Wipro with Adobe, Netscape, and Macromedia. When Wipro's software business became independent, Banerjee was the first general manager of Wipro.

In brief, the entry of India’s entrepreneurs into the software service industry at the time of the Seventh and Eighth Five Year Plans can be seen, on the one hand, as a choice of resource allocation based on comparative advantages, and on the other hand—and more significantly—as an active global orientation. Entrepreneurs often used their international contacts to identify new opportunities early on, and this helped them to become leaders in the software service industry in India. All three categories of company were very earnest in developing exacting software service standards and in seeking to position themselves advantageously by achieving internationally recognized standards. Furthermore, their use of the National Association of Software and Services Companies (NASSCOM) to collectively communicate the views of the IT–software industry to the government can also be viewed as a major initiative of India’s entrepreneurs.

**The National Association of Software and Services Companies**
Founded in 1988, NASSCOM has played a special and historic role in software and service development in India. During this stage, however, its impact was less as a social organization than as an indicator of choices made by enterprises.

To some extent, NASSCOM is the sounding board of large Indian IT–software businesses. Some say that the canvassing by big companies has been so effective that small and medium-sized enterprises have, to a certain extent, suffered unfairly and that the large firms should assume certain responsibility for the greatly varied size of software firms in India. We do not agree with this viewpoint. We believe that NASSCOM puts forward a clear agenda to the government on behalf of rising software enterprises in India, and represents the awakening of an independent consciousness of software enterprises in the country. As a result, the choices of the enterprise, the society, and the government are optimized simultaneously.

**Choices Made by the State Governments**
The innovations and choices made by state governments have been widely acknowledged as successful elements in the development of the IT–software industry in India.

During the Seventh and Eighth Five Year Plan periods, India’s state governments were far less amenable than they are today to the development of export-oriented software services. The identification of IT development opportunities, though attributable to the foresight and judgment of state leaders, was to a large extent a consensus reached at all levels of the industry. Those who first saw the potential of these enterprises were the state governments of Andhra Pradesh and Karnataka. Their innovations were subsequently adopted more extensively by the governments of other states and by the central government.

**The Effect of Different Choices Made by State Governments Under the Same Endowment Conditions**
This paper does not make an extensive analysis of the policies of the state governments of India; however, it is important to highlight that the different choices made by state governments under the same endowment conditions actually reflect the importance of those choices to the governments.

Take, for example, Karnataka (where Bangalore is located) and West Bengal (where Kolkata is located)—two regions with very different endowment conditions. Karnataka is a moderately developed part of India, with a below-average economic growth rate, many below average social and economic indexes, and endowment conditions that are inferior to those of West Bengal (Table 6).
If the development of software and information services were based only on endowment, then those in West Bengal should be better developed than those in Karnataka, since West Bengal has superior endowment conditions. However, this is not the case. On the contrary, Karnataka, despite its inferior endowment conditions, is far more developed than West Bengal in terms of software and information services. Of the top 500 software firms in India in 2002, 97 were in Bangalore and only 28 were in Kolkata (Table 7). Those who believe that endowment is a decisive factor cannot explain this great difference.

How could such differences be explained? Although there are likely to be many reasons, we believe the most significant factor is that the state governments of these two regions identified the opportunity presented by the IT–software industry differently and made different choices.

In 1997, Karnataka became the first state in India to declare IT policies (Naidu 2003), and as far back as 1985, it had been implementing accelerated IT software development plans from a position of initial advantage (Yan 1999). In contrast, West Bengal’s better endowment conditions provided opportunities for more diverse development options, and it therefore placed far less emphasis than Karnataka on the IT–software industry.

In Karnataka, the state government’s many preferential policies for software and information services have attracted foreign companies and those from other states,
and this has accelerated IT development. Policies include the provision of risk capital and the attraction of talent. These policies worked well in the presence of tax exemption for profits obtained from software exports, acceptance of 100% foreign equity holding, tax-exempt imports, simplified export formalities, and income tax exemption during the start-up period (Yan 1999). Interviews by the author found that most of the first group of India’s software talent returning from the US preferred to locate in places that offered more favorable conditions for software talent than their hometowns. They therefore chose Bangalore, not Kolkata where no preferential policies were available for software development at that time.

Karnataka has taken two critical strategic and innovative measures: (i) software development contracts are transferred from US enterprises in Silicon Valley to make up for the shortage of domestic demand, with the result that the endowments of developing countries are grafted to market demand in developed countries in order to surpass their upper limit of production potential; and (ii) a 330-acre electronics city was built in Bangalore. Enclaves modeled on those found in developed countries have partly replaced the deficiencies of state infrastructure by not having to wait for the improvement of the country’s overall infrastructure. Table 8 shows the rapid increase in both the number of software companies in Bangalore and the gross exports.

The transformation of Kolkata further demonstrates the importance of selection. Bangalore’s success greatly stimulated other regions in India, including West Bengal. West Bengal witnessed a clear change in attitude toward the software and service industry, and in FY2001 it began to adopt similar policies to those employed in Karnataka to stimulate its IT—software development.

Different choices have made a great difference in the rate of development of software and information services within identical source endowment structures and locations. Kolkata paid a price for its late choice: a 3-year delay in adopting the same policies allowed it to slip about 3 years behind Bangalore, and this has made it difficult for its software and information services to catch up (Table 9).

The analysis shows that if comparative advantages are considered merely with regard to endowments, and governments do not seek out and capitalize on rising

Table 8: Registered Software Companies in Recent Years in Bangalore, by Gross Exports

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of Registered Software Companies</th>
<th>Gross Export ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>13</td>
<td>2.29</td>
</tr>
<tr>
<td>1993</td>
<td>29</td>
<td>6.72</td>
</tr>
<tr>
<td>1994</td>
<td>53</td>
<td>28.69</td>
</tr>
<tr>
<td>1995</td>
<td>79</td>
<td>63.70</td>
</tr>
<tr>
<td>1996</td>
<td>125</td>
<td>143.50</td>
</tr>
<tr>
<td>1997</td>
<td>163</td>
<td>276.06</td>
</tr>
<tr>
<td>1998</td>
<td>207</td>
<td>457.42</td>
</tr>
<tr>
<td>1999</td>
<td>267</td>
<td>760.63</td>
</tr>
<tr>
<td>2000</td>
<td>782</td>
<td>1,015.40</td>
</tr>
<tr>
<td>2001</td>
<td>928</td>
<td>1,636.23</td>
</tr>
<tr>
<td>May 2002</td>
<td>1,038</td>
<td>2,076.45</td>
</tr>
</tbody>
</table>

Source: www.bangaloreit.com/htm/itsckar/itindustriesothercities.htm
opportunities, there is a danger of being surpassed by those who are more active in applying competitive advantages.

### Change of Resource Endowment Structure by State Governments

On the role played by India’s state governments in IT–software development during the period of the Seventh and Eighth Five Year Plan, we propose a new perspective: we believe that the state governments of Andhra Pradesh and Karnataka exploited the functions associated with competitive advantages while following natural comparative advantages. It may also be considered the role of government (at least state governments) to take the initiative to try to change the resource endowment structure through policy measures, rather than to simply follow resource allocation policies according to fixed resource endowment structures, as was previously the case.

During the Seventh and Eighth Five Year Plan periods, state governments innovatively followed the emerging global trends in software technology. At the same time,
their actions influenced the international division of labor in the global IT–software industry by transforming comparative disadvantages into competitive advantages and exploiting comparative advantages. Such innovation is a key factor in the success of IT–software development in India.

The actions taken by the government show that infrastructure disadvantages can be transformed into comparative advantages through the construction of software parks, the disadvantage of capital scarcity can be transformed into the comparative advantage of capital centralization through the construction of risk investment mechanisms, and the disadvantage of scant domestic demand can be transformed into the comparative advantage of being driven by international demand through preferential financial and tax policies.

Central Government Policies
The role played by the central government during the second stage of the development of the software and information service industry was critical for the transformation from comparative advantages to competitive advantages.

We believe that the role played by the Government of India during this stage was different to its role during both the previous and the subsequent periods. Compared with the first period, the central government showed a more active selection consciousness (such selection is after all based on the selection intention expressed by enterprises through NASSCOM). However, compared to the subsequent period, the government had still not found the most effective way of exploiting competitive advantages (until it was enlightened by the practice of state governments), and was still somewhat limited by its focus on comparative advantages and endowments.

The central government made some significant choices during the second stage:

• The Computer Software Export, Development, and Training Policy was promulgated in 1986. This was a sign that the ideas of import substitution and independence had been officially abandoned. (In 1985, the central government exempted all export profits from income tax.)
• NASSCOM’s views were considered by the central government, and this could be viewed as evidence that the government listened to recommendations of the industry, which were consistent with the intentions of state leaders.
• Policies were issued in the 1990s that stimulated the development of the export-oriented software industry in India.
• In 1991, software parks began to be constructed. These are known as the Software Technology Parks of India (STPI).

Stage Three: Optimized Multiple Selection by the Enterprises, Society, and the Government, and Through Exploitation of Competitive Advantages, 1998 to Present

In 1998, the software and information service industry in India witnessed two symbolic and significant events: (i) India announced the historic Information Technology Action Plan, and (ii) Wipro reached the top grade of the Capability Maturity Model for Software (CMM). These were signs that both the state and enterprises in India were ready for the world stage. (The millennium bug 2 years later could be regarded as a
chance that was seized upon in a prepared and deliberate manner). From that year, India’s software and information service industry entered a new phase, with the major change being the switch from the mixed dominance of comparative advantages and competitive advantages to the sole dominance of competitive advantages. India as a whole has entered into the state described by Porter as “the competitive advantage of nations.”

India created a brand-new mixed model during this process. This model for the service industry features low cost and high added value, and matches local supply in developing countries with global demand from developed countries. It has proved to be a significant breakthrough and has superseded both the idea that demand from developed countries could only be satisfied by supplies from developed countries, and the idea that developing countries could only rely on comparative advantages based on local markets (International Economic Information 2007).

**Choices Made by Enterprises**

During stage three, India’s enterprises, ahead of those in neighboring countries, grasped the fact that the era of simple reliance on cost comparative advantage was gone. According to Kiran Karnick, chairman of NASSCOM, cost is still an important factor, but not the only factor. Nandan Nilekani, chief executive officer of Infosys, adds that wise companies have already realized that outsourcing not only can save on cost, but can also change their operating strategies. A customer who pays for 100 people to work for him also expects to obtain certain business results. So, Indian companies must improve the quality of their employees.

Competitive advantage is accomplished collectively, and for small and medium-sized enterprises, the following three conditions must be satisfied before companies can realize competitive advantages as India’s enterprises have done.

**First, find and change the law of competition.** Wipro created the law of the service industry, just as Wal-Mart formulated the law of commerce. In this sense, Wipro ranks with Wal-Mart in terms of impact on its sector (Hamm 2007).

Matching of local supplies from developing countries with global demands from developed countries are the features of the business model that combines low cost (supply from developing countries) with high added value (demand from developed countries). The PRC has created this law of competition for large-scale manufacturing, while India has created the same law of competition for the large-scale provision of services. However, India’s policy is more comprehensive since manufacturing in the PRC has expanded the production capabilities of the export industry only with regard to globalization, and without obtaining competitive advantages in its industrial division. Software and service enterprises in India, however, have identified and dominated both in terms of the extent of the market and evolution of the division of labor.

**Second, adhere to industry standards.** Software firms in India took the lead in adopting CMM as the standard for the IT–software industry and employed this standard extensively. In the field of IT, those who set the standards will also grasp the opportunities in terms of both technology and products. Many people believe that the success of Indian companies is attributable to their compliance with standards; however, in reality Indian companies have reinforced the CMM, not the other way round. These companies had chosen the path of internationalization, and so they recognized the strategic benefit of CMM accreditation.
Third, create brands that meet demand from high value-added markets. Companies compete for consumers; however, in the field of service outsourcing it is difficult for developing countries to find sufficient consumers in local markets. Fortunately, the internet brought consumers to their doorstep. To make the shift from the low-end market to the high-end market in an accelerated manner, and to meet the quality and management requirements of high-end markets, companies must create their own service brands based on resource integration. Indian companies have done well in this area.

It must be pointed out that enterprise and entrepreneurs played a critical role in the success of software and information services in India. To a large extent, all the government needed to do was to loosen restrictions over enterprise in order to ease the environment for entrepreneurs. Under most circumstances, the government is in a state of inaction, which is favorable for the development of enterprises; but in this case, the government’s inaction created favorable conditions for the industry to grow. Although this point will not be stressed, this should not be interpreted as a denial.

There are four categories of enterprise in the IT–software industry that exert a key influence on the formation of the industry clusters responsible for its global rise: (i) big groups like Tata, (ii) entrepreneurs like Infosys and Wipro, (iii) transnational corporations like IBM and Hewlett-Packard, and (iv) state-owned companies like Computer Maintenance Corporation (Nilekani 2008).

Large groups can promote the overall strength of the industry. In the PRC, comparatively smaller groups, including IT groups, are behind in the development of the IT–software industry. Similarly, excellent entrepreneurs are at the heart of the industry, but compared with those in India, software entrepreneurs in the PRC lack an international perspective, are less capable of international orientation, and have a more technological knowledge structure.

In India, transnational corporations have strenuously promoted the research and development capabilities of local IT companies, since Indian companies have proved more active in training, absorption, and transformation. They tend to learn through doing and do while learning, which helps enhance their competitive strength. These factors set Indian entrepreneurs apart.

For any type of enterprise, the spirit of entrepreneurialism is the key factor for success. Software companies in the PRC have grown up in a less challenging policy environment, since they did not face foreign exchange control and tariff restrictions that used to prevail in India. However, unlike their Indian counterparts, when faced with difficulties, companies in the PRC tend to seek help from the government and turn to protectionism instead of looking for innovative solutions.

Choices Made by the Government
In 1998, the Government of India started to take over the role of leading actor from the state governments, and for the first time, choices made by enterprises and state governments became national choices.

Completion of Identification and Selection
On 22 May 1998, the Prime Minister of India formed a special task force to develop a national policy on information technology and software. Their product—the Information Technology Action Plan—marked the shift in the nexus of software and information services in India away from spontaneous action toward conscious direction. India had made a clear choice. The plan, and its subsequent revisions and
additions, sets out to accelerate the construction of world-class information infrastructure. It creates India’s 2008 IT export target of $50 billion, and anticipates a potential global IT volume of $2 trillion in the same year. The government should put in place proper policies to achieve the 2008 export target through accelerated development of the IT industry.

**Perfect the Development Environment**

The reforms of 1991 led to an overall improvement in the business environment in the country. The macroeconomic reforms undertaken by the Government of India—the liberalization of foreign exchange and capital markets—created a liberal investment climate for enterprises. For example, Infosys was openly listed for the first time in 1993 after the abolition of the Controller of Capital Issues in June 1992—a move that was very helpful for an industry that had once found it difficult to obtain loans (Nilekani 2008).

The central government enacted some very significant industrial policies that aimed to promote the development of the IT–software industry. These can be divided into policies to enhance comparative advantages, and policies to exploit competitive advantages. Policies on comparative advantages can be further divided into (i) policies to enhance comparative advantages, including measures to further exploit education and talent advantages and policies to further reduce costs; and (ii) policies to overcome comparative disadvantages, such as infrastructure.

There are four kinds of policies to help exploit competitive advantages:

(i) **Industrial policies.** Prominently reflected in tax and tariff preferences, including income tax preferences and zero import tax, industrial policies provide incentives for industrial development and market expansion (Nilekani 2008). Many scholars who lack experience in the workings of government fail to appreciate their role. Being a strong stimulant, tax preference pushes enterprises to develop in the direction selected by the government. The Information Technology Action Plan includes up to 39 tax-related measures. How many of these were proposed by NASSCOM and how many the government has adopted is unimportant. More relevant is how the choice made by the government balances the national interest with the tax relief sought by software and information service industry, while ignoring other less important requests. Compared with other Asian countries, the determination and devotion of the Government of India is impressive.

(ii) **Supportive industrial policies.** These are mainly reflected in policies to support industrial clusters, such as the software technology parks of India (STPI). Since 1998, the competitive advantages of the IT–software industry in India have been expanded from initial spontaneous concentrations of enterprises and local industrial clusters to national industrial clusters. India now has 47 STPIs throughout the country covering almost all provinces. The new phase of the STPI has become an important reflection of national competitive advantages, as the STPI centers are effectively an endowment substitution (i.e., the conditions of relative endowments can be changed through local infrastructure improvements at software parks, since infrastructure conditions across India cannot be improved simultaneously).
Big enterprise policies. One of the most prominent effects of such policies is the establishment of venture capital mechanisms, and this is the main difference between India and the PRC and between India and other Southeast Asia nations. The public sector-dominated banks in India promoted, with government support, start-ups in the sector, which subsequently became world-class large enterprises.

System reform and electronic government plans. These have had a positive effect on the development of the software and information industry in the country.

The Role of Associations
India is advantaged by the presence of industry associations such as NASSCOM, which collectively voice the interests of private enterprises and participate in decision making. Such participatory decision making, which works from bottom to top, can help optimize the choices made by the enterprises, the government, and society so that the common interest can be quickly identified and rapidly transformed into common intentions. For example, NASSCOM has an excellent record in areas such as government relations, addressing western protectionism, and certification of education qualifications (Nilekani 2008).

Another important function of associations is the provision of service and industrial coordination functions, including the enforcement of quality standards, such as those of the ISO and CMM; promotion of technical, business, and industrial integration of the software and information service industry; and labor division–based cooperation in the industrial chain.

The association and software park also serve as a platform for international promotion, which helps advance cooperation between Indian companies and other companies worldwide; hence, they have become a necessary part of competitive advantages.

In brief, the success of India’s software and information service industry is the result of both a series of events and the optimized selection and resource allocation by companies, governments, and society in India. The early exploitation of competitive advantages is the key factor. These factors are now discussed in more detail.

Key Factors in the Success of the Software and Information Service Industry in India

Summarizing India’s success factors, Heeks and Nicholson believe that software demand from the top international markets is the “pulling force,” while national software plans and strategies and the national software infrastructure at the bottom are the “pushing force.” A software-exporting country can be successful only when the “pulling force” and the “pushing force” work at the same time (Heeks and Nicholson 2002).

Based on the Software Export Success model proposed by Heeks and Nicholson, Carmel has studied the success factors of software-exporting countries, including India, and has adapted the model to form the Elliptical model, which consists of eight
success factors: (i) government strategies and policies, including financing policies and tax preference policies; (ii) human resources, including the cohesiveness, traditions, population, composition, linguistic skills, and management skills of the people; (iii) wage cost; (iv) living standards; (v) contact and communication among individuals, groups, companies, and countries based on different regions, cultures, languages, or nationalities; (vi) technical infrastructure; (vii) capital, both domestic and from abroad; and (viii) industrial characteristics, including the industrial cluster effect, the number and scale of enterprises, the strategic awareness and brand awareness of associations and enterprises, and enterprise standards (Carmel 2003).

In his diamond model on competitive advantages, Porter states that the determinants of national competitive advantages fall into four categories: (i) factor conditions; (ii) demand conditions; (iii) related and supporting industries; and (iv) company strategy, structure, and competition. These four interlinked categories of factors jointly maintain the competitive advantages of the country, and factor conditions alone are inadequate (Yan 2005). Factor conditions are mainly related to gifts or comparative advantages, while the other three categories of conditions are mainly related to selection, or competitive advantages.

The four categories of factors identified by Porter are also seen as the main reasons for the success of the IT–software industry in India. The government has enhanced these factors and transformed them further into national competitive advantages. These main success factors and the nature of the government's role are now reviewed in more detail.

**Factor Endowment**

**Cost Advantages**

The low cost of labor is widely acknowledged to be the most important comparative advantage for the IT–software industry in India. This is particularly applicable to industries with low added value. The labor cost of various IT specializations in India is estimated to be 17%–55% of the US rate (Table 10).

In addition to attractive labor costs, the rapid development of broadband, together with reductions in the cost of international networks and fiber-optic links, and the falling cost of computers, have provided technical conditions for the globalization of the IT–software industry in India.
of the IT–software industry and have enabled these cost advantages to be exploited (Nilekani 2008).

**Language and Mathematics Endowment**

India’s scholars believe that English education and knowledge provides natural advantages, giving India a competitive edge in human resources. It is also generally believed that Indians are good at mathematical thinking, which is a definite advantage for software programming (Heeks and Nicholson 2002).

**Global Demand Orientation**

Demand orientation has often been studied as an internationalization phenomenon or export-orientated strategy. Heeks and Nicholson’s studies of the software export strategy of developing countries, and of the economic transformation of those countries, suggest that economic globalization provided the opportunity for India’s IT–software industry to adopt an export-orientated strategy.

Scholars in the PRC have also studied the international demand-based IT–software industry of India. Liu Jianghua believes that one reason for its growth is its global orientation (Liu 2001). According to Yang Changzhi, the rapid industrialization and global orientation of India’s IT–software industry has benefited from strategic trade policies promulgated by the government for the industry—namely, government’s provision of the necessary financial and infrastructure support, emphasis on research into international market development trends, and export promotion (Yang 2002). Zhang Yiming (2003) views India’s IT–software industry as an export industry, supported by export-promoting government policies.

A key way in which India’s outsourcing providers have made demand-orientation a reality is by setting up their own bases in the West so they can build a closer relationship with their customers. Vaswani, the director of Wipro’s global IT business, states that both the remoteness and proximity of their location worked for them: “the data center (for the US customer) must be located in the US, which can make the customer feel easier” (International Economic Information 2007).

**Related Industry Support**

**Growth of the Supply Chain**

The growth of the supply chain benefits from good contacts. Most of the exports of India’s software enterprises are sourced by Indians in the US, therefore, more than half of India’s software enterprises establish a subsidiary in the US, with the front office tasked with winning the contract that is then transferred to the development center (or to the back office) in India (Dai 2006).

Companies in India’s service industry can realize a comparative advantage by selecting business process outsourcing (BPO) to help them rise up the IT value chain. Today, a lot of India’s graduates involved in the outsourcing industry originated in the US and the United Kingdom. They engage in IT work, learn IT knowledge, or work in call centers. Some 78% of engineers from the mechanical, electronic, electrical, infrastructure, chemical, and biological fields enter outsourcing companies such as Tata Consultancy Services (Dubey 2004).
Industrial Cluster Effect

Approximately 80% of students from the six best-known institutes of technology in India move to the US after graduation (Desai, Kapur, and McHale 2003), where Indian students make up a growing proportion of foreign students (Table 11). This has created a high concentration of technology knowledge and has promoted the formation of industrial clusters. As noted by Pramod Mahajan, former minister of the Ministry of Communications and Information Technology, these talents “bring back the capital, bring back the information that an Indian education has proven to be reliable, and especially bring back the spirit of innovation” (The Times of India 2001). The fast growth of India’s IT–software industry is closely related to the capital that overseas Indians invest domestically. They return to India with the capital, technology, and contacts to build on after a successful career overseas, or they act as a bridge between Western demand and India’s supply to drive the country’s development (Dai 2006).

Table 11: Number of Indian Students in the United States after India’s Liberalization Reform

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Foreign Students in the US</th>
<th>Indian Students in the US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>438,618</td>
<td>35,948</td>
</tr>
<tr>
<td>1994</td>
<td>449,749</td>
<td>34,796</td>
</tr>
<tr>
<td>1995</td>
<td>452,635</td>
<td>33,537</td>
</tr>
<tr>
<td>2001</td>
<td>547,867</td>
<td>54,664</td>
</tr>
<tr>
<td>2002</td>
<td>582,996</td>
<td>66,836</td>
</tr>
<tr>
<td>2003</td>
<td>586,323</td>
<td>74,603</td>
</tr>
<tr>
<td>2004</td>
<td>572,509</td>
<td>79,736</td>
</tr>
</tbody>
</table>

US = United States.


Customer Satisfaction

The strong demand for software from the fast-growing information industry undoubtedly provides a great opportunity for India. There is a worldwide shortage of qualified talent, and big companies in the West. However, companies such as General Electric and Nortel have been satisfied with Indian competence and as a result, have bridged international demand with domestic supply in India (Nilekani 2008).

Labor Quality

Early investment in higher education in institutions—such as the Indian Institutes of Technology, the Indian Institutes of Management, and Jawaharlal Nehru University—and huge private investments in engineering and administrative institutes during 1997–2007 have substantially upgraded human resources in the IT–software industry (Nilekani 2008).

There are two main divisions of labor in the industry:

Class I: Local labor. The pool of local labor is large and of high quality, and constitutes a rich source of software talent and an important force driving the rapid growth of India’s IT–software industry. Chen Jianmin proposes that since India’s software indus-
try is not capable of researching and developing a product (especially core software) innovatively enough to win the overseas market, the best choice for the country is to capitalize on its relatively cheaper labor to develop outsourcing services. Therefore, India orientated itself to develop outsourcing (Chen 2003). In March 2004, the number of professionals working in the IT industry in India was 813,500. According to NASSCOM, the number of software engineers in India has grown from 25,000 in FY1988 to about 250,000 in FY2003.

Class II: Professional human resources returning from overseas. Speaking on the benefits of the international migration of professionals, Arjun Singh, former Minister of Human Resources, noted that “in many cases, it brings positive effect to the country.” (The Times of India 2001).

**Firm Strategy, Structure, and Competition**

**Capital Market**
The Government of India augments the capital available to the IT industry in the following four ways:

(i) The government favors the risk investment industry in finance. It gives high-tech venture enterprises the ability to share the risk of the venture investor.

(ii) Tax privileges are given to venture investment enterprises. Long-term capital gains are all exempted from tax, which greatly stimulates the development of India’s venture investment industry. Tariff privilege is also an important aspect.

(iii) The government has initiated multiple-venture investment funds to support innovation. It subsequently allowed greater role to the private sector in venture capital activity with government support.

(iv) The government encourages investment by overseas venture investment funds.

**Professional Selection**
The professional selection of overseas Indians enhanced India’s competitive advantage. According to statistics, 10 of India's top 20 software enterprises (40% of the sector’s total production value) were established and are managed by Indians returning from the US. Four companies are joint ventures between Indian and foreign companies, and all the executives are overseas Indians. NASSCOM was also established by Indians returning from the US.

The return migration of IT professionals from Silicon Valley brings back to India a resource of priceless social value. These professionals help transfer know-how by bringing advanced technology home to enrich and upgrade the domestic IT–software industry (Lin and Guo 2001).

**Management Structure**
Yu Xuequn holds that the internationalization of India’s IT–software industry includes the internationalization of its management. He believes that all successful Indian software enterprises consider management to be of utmost importance (Yu 2003). Shen
Weitao also asserts that the success of India’s software industry should be largely attributed to the internationalization and standardization of its quality management, and the systemization of quality tests (Shen 2001).

Guo Fuhua, however, considers international companies to be a driving force behind the rise of India’s software industry, although he also accepts that government support, strict management, and personnel training are influential. In his view, when developed western countries, especially the US, were in dire need of software engineers in the 1980s, it was India that exported the many well-educated and English-speaking workers to provide a quality on-site service to giant US companies, and these workers exhibited an outstanding talent for software development (Guo 2001). Subsequently, these young people also demonstrated management skills as brilliant as their skills in technology, with the result that they rewrote the law of international competition (Hamm 2007).

Enhancing Competitiveness Through Policy Measures

India has introduced policies to encourage innovations so that enterprises achieve competitive advantages. In 1985, the government established the Ministry of Science and Technology as an independent institution and then issued related laws and policies, such as the Technology Policy Statement (1983), the Draft for New Technology Policy (1993), the Science and Technology Vision up to 2020 (1998), the Science and Technology Policy in 2003, and the Law of Intellectual Property Rights (1995). In addition, the government encouraged enterprises to set up R&D centers by issuing them qualification certificates and offering them incentives. In May 1998, the Special Action Group of IT and Software Development was founded and the National IT Action Plan was prepared by the government in an effort to set up a national technological innovation system for IT and software development. In October 1999, the Electronics Commission was moved into the Ministry of Information Technology and tasked with coordinating national IT policies.

In India, IT training is financed by private as well as government sources. Over 4,000 IT training centers are operated by about 100 private companies, offering thousands of courses and providing both short-term professional training and long-term primary training. It is also encouraged that 6% of the value-added incomes (wage, allowance, and net profit) of all companies in the IT–software industry and other sectors are allocated to the human resource department for use in infrastructure construction and upgrading of educational and training institutions.

The Role of Government

In contrast to Indian scholars, PRC experts almost reached a consensus in their emphasis on the key role played by the government in the leapfrogging development of the IT–software industry. Indeed, many rank it as the top factor in the industry’s success. For example, some scholars argue that the most important reason for the success of India’s IT–software industry is the great attention from the government and the preferential policies introduced (Yao et al. 1998) while others think that the government’s principle of guiding at a macro level and liberalizing at a micro level has successfully established the industry frame, while the support of preferential policies and legal guarantees pushed the industry further (Lin 2001; Wu 2001).

Some PRC scholars even regard the government’s policies as the principal reason for the gap between the PRC and India in IT and software development, pointing out...
that the achievements of India’s software industry correlate closely with the PRC’s special industrial policies. Some experts within the industry have asserted that “due to problems in our (the PRC) industrial policies, we missed the first opportunity for software development” (Wang 2002).

Provide a Financial Subsidy
India’s banks provide favorable loans to software enterprises. Commercial banks and development banks use 5% of the deposit increment as a venture capital investment fund, and commercial and development banks subscribe to the enterprises equity capital. The subbranches of the commercial development banks have set up dedicated IT financial departments to serve software enterprises. The PRC has no such policy, and is short of venture capital investment.

Frame a Favorable Taxation Policy
In 1986, the Government of India introduced a policy to encourage the development of the computer industry. The central government and some 19 states have announced IT policies to support software technology production. These policies include a zero tax rate policy—i.e., zero customs duty, zero turnover tax, and zero service tax on the software industry. To encourage software exports, the exporters themselves are allowed to choose how to pay duty, and they are exempted from double taxation for importing and exporting software. The software products of new enterprises are exempt from sales tax for 3–5 years. Enterprises that export all their software products are exempt from income tax. Foreign capital can hold 75%–100% of the shares. To improve the quality of imported computers and to introduce advanced foreign technology, the government has relaxed its restrictions on imported computers. The capital limitation of enterprises that import computers was reduced from Rs200 million to Rs1 million. The restriction on importing computers has also been relaxed (Mao and Chen 2005).

Compared with India’s pertinent tax exemption policies, those of the PRC are not systematic, and this gives rise to tax avoidance and evasion.

Enhance Education Expenditure
Education is one of the cornerstones of India’s IT–software industry’s success. Education expenditure has been increased from 1.2% of GDP in the 1950s to 3.9%–4% in the 1990s, and it is expected to reach 6% by 2010 based on the Eleventh Five Year Plan. The government has especially increased investment in key universities and colleges. The banks and financial organizations are allowed to finance education including software technology education and training. The education system has improved and basic education is being popularized.

India’s IT talents have achieved great success abroad and have formed a powerful worldwide IT network. The large pool of local IT workers also attracts multinational companies and foreign investors to India. Business Week refers to postgraduate students of the Indian Institutes of Technology as “the most popular export products from India.”

Develop Software Parks and Other Infrastructure
The most notable action of the Government of India has been to build software technology parks for the development of software products for export. Favorable policies of the parks include customs duty, income tax, a special policy for importing and
exporting, a special bank lending policy, and copyright protection. For example, IT enterprises are entitled to select 5 consecutive years for tax exemption within the first 8 years of business operations. The government does not levy any income tax on their profits. The cargo import duty and excise are also exempted, and permission is not needed to import capital cargo, raw materials, components, and consumable parts. Foreign-funded IT companies that set up in the IT parks to manufacture products for export are also able to take advantage of the full range of favorable policies (Shu and Luo 2001).

The government should play a full and proactive role to create national advantage in the development of the IT–software industry at all levels. Wu Xianghong thinks that India has grasped the opportunity by tapping international capital investment and successfully establishing information technology parks with high bandwidth telecommunications facilities. This opened the door to the advanced countries' markets and laid a firm foundation for the development of an outward-looking industry. With the promotion of telecom uplinking facilities, the government saw the potential of the IT–software industry and began to take action to promote its development, urging it into becoming an export industry (Wu 1999).

Zha Canchang believes that the Government of India was aware that the scientific and technological revolution featured by IT will bring great challenges and opportunities. To avoid missing the opportunity for India to catch up with the new technology in the world once again, and to achieve accelerated development, the government grasped the chance and adopted favorable measures and preferential policies, and created favorable internal conditions and a liberal external environment for R&D in the IT–software industry. This enabled an economically underdeveloped country, with serious social problems and an unbalanced science and technology sector, to attract worldwide attention for its great achievements in the IT field (Zha 2002).

**Adopt International Standards**
Success is an inevitable result of adopting an international standard, and there is no doubt that the adoption of an international software standard is one of the reasons India's IT–software industry is so successful. The CMM Class 5 Certificate has become the standard of Indian software service, and constitutes a competitive advantage of the country's software industry.

**Differences between Information Technology Policy in India and the People’s Republic of China**
More than 10 years of research by PRC scholars has found that the Government of India’s key policies on taxation, risk investment, and education are quite different from those in the PRC.

Since the development of the IT–software industry involves many links, the validity of the government’s policy support has a great effect on whether or not the policies complement each other. In the PRC, many policies have been introduced by the state to support the IT–software industry, and these have modified or replaced other policies. They tend to be uncoordinated and unmethodical and are therefore difficult to understand. Some preferential policies have even been used by a few software companies to engage in real estate speculation.
Some scholars think that another significant characteristic of India's IT industry policy is the strong support it enjoys; this contrasts with the situation in the PRC (Wang 2002). The Government of India built support for its policies by gradually refining them to reflect the requirements of enterprises at each stage of development and to create an enabling environment for the enterprises to take part in economic globalization (Lateef 1997). Meanwhile, central and state governments have taken steps to improve supporting facilities and services by constructing software parks. These aspects provide useful lessons for the PRC.

**Important Policy Lessons**

It should be pointed out that success factors and success experiences are not the same thing. Success factors that cannot be emulated or transplanted (e.g., the intellect of the Indian people) cannot be counted as success experiences, as they cannot be suggested to other Asian countries for reference. This paper will instead emphasize those that relate to leadership. The experiences of India's IT–software industry are summarized to provide food for thought for governments and to provide lessons for other Asian countries.

Indian scholars A. Husayn and A. M. Zadie believe that the success of India's IT industry is related to the economic ideology of former Prime Minister Rajiv Gandhi, who was known as the father of IT in India. According to Indian economist B. K. Aluniya, Gandhi's technical background meant that he was a staunch proponent of the importance of technology in economic development. He supported polices that upgraded the existing technology and encouraged the development of new technologies that would shape the economy.

When faced with new IT opportunities, developing countries should carefully select a strategy to gain maximum advantage. The traditional practice has been to participate in the international division of labor, relying on comparative advantage to gain low-end value added. However, India’s experience shows that it is possible to take a different approach in which, from a baseline of comparative advantage, a country can realize development by relying on competitive advantage to achieve success in the high value-added market.

Choice refers to insight or foresightedness and critical industry selection, and reflects a country’s leadership and initiative. It can be acquired through research. In 1995, B. R. Martin—a British expert in technology foresight—proposed that technology foresight can be attained by conducting a systematic study of science, technology, the economy, and social development in the future with the aim of defining strategic research fields and making choices that maximize socioeconomic benefits. In the context of our research, insight indicates the identification of opportunity, specifically in this case, the identification of IT industry opportunities. Technology choice, however, also involves the selection of key fields of technology development based on a clearly envisaged goal and a vision for the future in order to realize a country’s objectives against a background of limited social resources and increasingly fierce international competition (Cui et al. 2004).

PRC scholar Ma Songde believes that because India was a developing country with poor economic and technological infrastructure, very limited per capita resources,
and a large population, the country needed to develop national strategies and appropriate policies to achieve accelerated development in specific fields. India chose the IT industry—the most active industry in the economic globalization era—and selected software as its core driver (Ma 2002). Observing decision making in India’s IT–software industry, Yu Xuequn believes that to achieve accelerated development, a country must carefully assess the technology trends in the world economy and anticipate and seize external opportunities. He also believes that to achieve this objective, the government must be farsighted in industrial decision making, flexible, and bring its advantages into full play (Yu 2003).

In summary, there are two areas of opportunity: the new market generated as a result of the expansion of potential production capacity, and the continued expansion of industries as the global labor market becomes more specialized. India’s success is attributed to the fact that it has seized the opportunities provided by both areas. India’s experience provides the following eight principal lessons:

(i) **The choice of industry must be made with a vision of economic integration.**

M.E. Porter believes that the choice of industry is an important factor in building up a country’s competitive advantage. The information technology revolution brings about technology integration, business integration, and industry integration and results in industry division and cooperation around the world. The opportunities emerging due to value chain expansion must be identified and chosen to capitalize on the strategic development of the industry.

A popular misconception among Asian countries concerns their choice of industry: they opt for traditional industries, while the international community has shifted toward high-end industries. A particular preference for hardware industries has led developing countries to specialize in low value-added products.

In contrast, India selected and grasped the IT industry. Its manufacturing industry expanded into software, and then evolved service industry activities. Based on comparative advantage, India selected high value-added industries early on by exploiting its competitive advantage.

In distilling lessons from India’s experience, it is important not to view business process outsourcing (BPO) only from the perspective of comparative advantage or cost. In reality, the most valuable lesson from India regarding BPO is competitive advantage, i.e., selecting the high value-added end of the industry chain. As indicated by James Lin, chief executive officer of Infosys in the PRC, “When you are helping the customers to renovate or restructure application software, you are really pursuing the target of long-term value as a BPO company.”

India’s experience shows that the IT industry and software service chain is continuing to expand. Software service outsourcing and BPO are the result of innovation, and the early birds that set the ground rules for the industry are in the best position to reap the rewards.

New opportunities will continue to emerge. These include future high-tech IT development opportunities such as

- those that combine hardware and software;
- embedded software;
- new business opportunities resulting from combining software and service;
• the information security problem;
• the combination of software, service industry, and hardware design industry;
• the application of open-source code technology and component technology to push the development of production scale and efficiency;
• the combination of the digital culture industry and the information service industry;
• entertainment and e-business;
• new opportunities in broadband video frequency information services resulting from the combination of electronics, telecom, and broadcasting; and
• new business resulting from the combining of fixed and mobile telephone networks.

Asian countries face many more opportunities than India did when it embarked on developing its IT–software industry, and they are in the same position as India before it selected the high end of the IT industry chain. This knowledge should inspire other Asian countries.

(ii) If opportunities are identified from a global perspective, they can be exploited by targeting rapidly growing global markets.

Asian countries have a mindset that the development of proprietary industries can only be based on domestic market demand. However, although it is logical to integrate proprietary industries with domestic demand, it is not the sole choice. Only when both international markets and domestic markets are conquered can accelerated development be achieved. Creating demand can be the driving force for competitive advantage (Porter 1999).

India’s experience proves that a developing country can adopt export strategies to acquire a niche market in developed countries when domestic demand is insufficient, and can thereby achieve accelerated development. It also shows that catering to international demand requires policies that liberalize markets and that the adoption of passive protectionist policies is not advisable.

The IT–software industry in the PRC has been carefully protected. When reviewing its development over 20 years or more, it can be seen that fostering protectionist policies has helped many software enterprises, but has also shielded some domestic software enterprises from fierce international competition. Government protection and support of the IT–software industry in the PRC has encountered some methodological and practical problems and has distorted the development environment of the industry (Li 2005).

Segregation of domestic and foreign markets creates distortion in the PRC’s IT industry, such that the development of the IT–software industry has been merely a poor substitute for imports from the outset. Due to the lack of effective competition and limited motivation to innovate, the PRC’s IT enterprises have been unable to absorb the technology spillover of developed countries. As a result, their competitiveness has progressively worsened (Li 2005).

India’s experience also shows that catering to global demand is conducive to the establishment of large IT–software enterprises. In the PRC, there are numerous small IT–software enterprises and very few large ones because the local market is small and demand is sparsely distributed. This situation is favorable to small enterprises that subsist on customized production, but unfavorable to large enterprises that specialize
in mass production. In line with India's experience, cooperation with large multinational enterprises and the progressive pursuit of the global market is the only way for a PRC software enterprise to develop.

The PRC should take advantage of opportunities presented by the rapid development of the international IT–software industry, and should consider the domestic markets of the US, Europe, Asia (mainly the Republic of Korea and Japan), and the PRC as an integrated international market (Qu 2005).

When resources are allocated according to an international perspective, the endowment structure is not static, and will actually become a dynamic system. When the PRC began to manufacture IT hardware, conventional wisdom prevailed: it was thought that the PRC could only develop the traditional labor-intensive industries according to its resource structure, and that it was unsuited to the development of high-tech industries. However, through coordination and the international division of labor with the US, the IT hardware manufacturing industry has become one of the country's major industries. The same has proven true in India's case in IT software. The successful experiences of the PRC and India should be studied and applied to other fields and in other Asian countries.

(iii) Selective tax incentives can play a key role in the accelerated development of the high-tech information service industry.

Compared with India, the major problem with the PRC's tax preference policy is that it is not clearly focused on encouraging investment in science and technology. It concentrates on profit-making enterprises rather than mitigating investment risk and other costs that are important to the high-tech information service industry.

The supportive taxation policies pursued by the Government of India have played a significant role in the development and success of the IT–software industry. They can be divided into the preference in income tax and the preference in customs duties. The preference in income tax exempts developers from income tax for the profit obtained from computer software export. Software developers in India can enjoy two kinds of preference in income tax: (i) income tax exemption for computer software exports, and (ii) tax preference for R&D and a tax-free period for new enterprises in the software technology parks. Preferential policies toward customs duties include exemption from import duty on computer software (Xi 2000).

The lessons the PRC can learn from India are to

- fully exploit the incentive effects of taxation policy to mitigate and share the risks of science and technology investment and to support the R&D activities of all kinds of enterprises,
- attract and encourage private and foreign capital to invest in high-tech industries,
- encourage science and technology advances to be translated to production technology,
- attract and cultivate R&D talents, and
- form a policy chain to encourage investment in science and technology industries.

To extend and widen the exemption policy to value-added tax to reduce the investment cost of science and technology, the Government of the PRC should:
• Advocate the consumption type of value-added tax in high-tech enterprises.
• Extend the scope of value-added tax exemption in high-tech enterprises. Make intangible assets related to high-tech enterprises (such as technical know-how) deductible under value-added tax to reduce the risks associated with introducing advanced technology.
• Exempt new high-tech enterprises from value-added tax for a limited period.
• Provide favorable treatment under income tax for high-risk investments in technology-intensive industries.
• Introduce accelerated depreciation to high-tech enterprises (i.e., allow enterprises to deduct part of their expenditures from taxable income), as is the practice in India. The property tax of the national software industry base should be halved.
• Allow enterprises to treat their investments in science and technology as tax-deductible expenditure when computing income tax, as is the case in India. Extend the eligibility limit for deduction of R&D expenses. Provide favorable tax treatment to allow the accumulation of reserves for science and technology development.

(iv) Establish effective channels for the financing of software enterprises.
One of the main reasons why the PRC’s IT industry is less developed than that of India is because it is disjointed from the capital market. This has blocked financial innovation. The traditional finance tools actually hinder small and medium-sized IT enterprises. For example, a mortgage is needed to get a loan from a bank; however, the main input of IT enterprises is human resource, so it is very difficult for such enterprises to get loans.

Indian experience shows that the modern venture capital investment system can combine science and technology with finance to promote the industrialization of the high-tech and service industries. Indian commercial banks and development banks provide venture capital investment. They also buy to contribute to equity capital. Furthermore, commercial banks have established IT sub-branches dedicated to serving IT enterprises (Wang 2002).

In the PRC, the policy for coordination between banks and enterprises should be relaxed to help IT enterprises. To solve the problem of inadequate access to funds for small and medium-sized firms, the PRC can refer to India’s experience: the domestic banks and other financial institutions should work together with domestic or foreign companies to set up venture investment funds for different specialty areas, and to help software enterprises enter the PRC’s domestic and foreign stock market for financing. The new IT enterprises that are registered for one year should be allowed to raise money on the market.

(v) Establish technical and vocational training facilities to support the software and information service industry.
In Porter’s theory of the competitive advantage of a nation, an important area of government intervention is the establishment of the training and human development system to enhance the country’s competitive advantage in human resources.

At present, a lack of high-level experts and low-level blue collar workers is the main problem for IT staffing in the PRC. The country should learn from India’s suc-
cessful IT human resources development experience. It can also draw lessons from India's success at cultivating high-level IT talent. This has been achieved due to a higher education system that efficiently produces first-class IT talents, and has been helped by India's policy of cultivating and enticing overseas IT experts to return.

One feature of India's training system is to track the latest developments and to follow up the requirements of industry. The Indian National Institute for Information Technology is not only an IT enterprise but also an IT education institution that can develop IT talents independently to fulfill human resource needs. At the same time, these talents promote the development of the enterprises. Mr. Rajiv, education director of the India National Institute for Information Technology, commented:

We are emphasizing the importance of theoretical education. In the meantime, we are very much emphasizing the practical and operational ability training based on the actual requirements of the orders from the customers of foreign countries. The students can participate in the real project work during the study stage. They will become qualified IT workers very soon after they enter the enterprises.

Many Indians from the higher socioeconomic groups have engaged in IT work in large multinational corporations in the United Kingdom or the US. Their rapid increase in skills and broader perspectives enabled them to establish their own multinational corporations, and this has advanced the level of development of the relevant industries. Indian outsourcing service suppliers can maintain their advantage partly because they have established their own bases in the West, providing convenient access to their clients. Wipro's purchase of IT Xchange for $0.6 billion created a bridge that facilitates talent recruitment in the US (International Economic Information 2007). As the PRC develops its outsourcing market in Japan, it can learn from and draw on India's successful expansion into the US market.

The experience of blue-collar workers in India can also be drawn on to cultivate low-end software talent. Although India is not a rich country, 90% of the software workers receive only a vocational education. A complete vocational education ensures that India has a large number of capable blue-collar programming workers (Wang 2002). India’s education of primary IT workers is already systematic, socialized, and industry-supported. For example, in the Aptech Certified Computer Professional (ACCP) course run by Aptech—the famous IT training organization in India—some 160 periods or hours of classroom instructions are used for educating primary programmers, 184 more periods are spent to upgrade primary programmers to program designers, and finally, some 330 more periods are used to produce system analysts. Large numbers of qualified IT blue-collar workers (middle- and low-level programmers in IT enterprises) are produced.

(vi) Develop the necessary support infrastructure for the software and information service industry.

India realizes its software and BPO competitive advantages mainly through its software technology parks. Successful experiences of such industry groups in the PRC's manufacturing industry show that the country's IT industry would also benefit from such an arrangement.

It should also be noted that the conditions for the formation of an Indian IT–software industry cluster differ from Porter's theory. Porter's theory on industry clus-
ters stresses the gathering of material elements, whereas in India, all the successful software parks have both material elements and intellectual elements (e.g., colleges, experts, and culture; Bangalore being a good example). The PRC has many software parks but very few of them are highly successful. The lesson to be learnt from India’s example is that there is a difference between building an IT industry cluster and an ordinary industry cluster, as the IT industry cluster is not only a concentration of materials but also a concentration of education, science, and technology. Therefore, IT parks should be built only if the infrastructure for education, science, and technology is concurrently available.

(vii) Establish institutional mechanisms to promote dialogue and cooperation among enterprises, government, and social organizations.

The exploitation of competitive advantages should be based on a mechanism of mutual assurance. India’s experience shows that a good system of cooperation between enterprises, government, and society can be mutually reinforcing. The decision-making system of India’s IT policy and NASSCOM’s system of participation in decision making have externalized such principles. In May 1998, India set up the National Taskforce on Information Technology and Software Development, and framed the Information Technology Action Plan. From the human resource structure of the task force and action plan, it is clear that industry–government coordination is greatly emphasized.

As Porter points out in his discussion on the competitive advantage of nations, many of the competitive advantages enjoyed by a company are determined not by the company itself, but by its location and that of the industry group. It follows that companies should cooperate with the government to promote their collective fortune and spur the construction of projects and public facilities. Industrial organizations and chambers should also play an active role (Porter 1999).

In India, some of the innovations of state governments (such as establishing software technology parks) have been expanded by the central government due to the excellent results achieved, and have been imitated by other state governments. Some suggestions—such as exempting import tax on software and permitting software technology parks to be registered as independent units—have been raised with decision makers by industry associations, due to strong consultation with industrial organizations and major chambers of commerce (Deng 2002). The reverse of this situation, i.e., governments acting unilaterally and without consultation with enterprises, will lead to ineffective decision making.

(viii) Accord special status to the modern service industry, improve the industry’s environment, and create enabling conditions for the development of the service industry.

The call center industry needs to be reinforced by providing a supporting environment to eventually develop a modern information service industry. A very important difference between the modern information service industry and the traditional service industry is that it depends on support from a technical service platform. India’s experience shows that focusing on the construction of a service platform and supporting it with special policies are the key to the development of a modern information service industry since the IT service industry in India started with the development of call centers. By building software parks, India has prepared a supportive environment for the infrastructure needs of the call centers and maintained a vital service industry.
The development of an outsourcing service industry also needs strengthened policy design for social capital. The difference between the service industry and the manufacturing industry is that goods are not exchanged during service. A policy framework intended for material assets, such as property protection, is unsuitable for the software and service industry. Therefore, the system must be designed to take into account nonmaterial factors.

Data from NASSCOM show that the percentage of call center business in India declined from 85% in 2000 to 35% in 2006, and high-end BPO grew at an annual rate of up to 37% during that period. As the industry grows and changes, not only will businesses need to upgrade their systems, but they will have to provide higher standards of service. An assessment of a company’s capacity for outsourcing in the US covers an increasing array of non-material factors, such as the capacity for English, experience of completing US projects, team size, field support in the US, appreciation of cultural differences, flow control and quality control, marketing, geopolitics, a sound legal system, government support, cost superiority, education and human resources, and trademark. Most of these factors relate to social capital.

India’s experience shows the extreme importance of social capital to the service industry, therefore, the design of systems and policies should emphasize the development of social capital, rather than devaluing social capital to promote technical and financial capital.

In India, cooperative networks and flows of trust and knowledge are important parts of the social capital that have helped to internationalize Indian software enterprises and improve the global competitiveness of the country’s software enterprises (Dai 2006).

It is also important to point out the need for not only technical human resources, but also integrated human resources. India’s experience shows that pure information technicians have not been able to meet the requirements of development. Personnel need to have a background both in information technology and specific industry operations. Information service personnel in India come from every industry. During the development of the software and information service industries, experts from the banking industry and finance promoted the merger of the IT and banking businesses. With the deepening of IT outsourcing, there are many professionals with management experience and competence who provide consultation services for the outsourcing business. In contrast, most PRC IT practitioners are engineers who lack the capacity for IT consultancy. This highlights the importance of combining business managerial skills with IT knowledge.

Likewise, a more sophisticated system is needed to develop the service industry than the manufacturing industry. Some scholars believe that the reason why the development of the service industry is limited in the PRC is due to the overall environment rather than human resources (Wu 2007). Professor Chen Zhou of Yale University believes that a manufacturing industry with lower value added appears to have a low sensibility to its systematic environment, while a service industry with higher value added appears to be highly sensitive to its systematic environment.

Although the service industry concerns mainly people, impersonalized transactions are the norm. Security must therefore be guaranteed, and this requires a rule-based system (Wu 2007). India’s experience shows that a sound rule of law can ensure the development of the service industry. Effective legal systems help simplify and regulate social relations, reduce transaction costs between people, and enhance
the development of a modern information service industry. In other Asian nations, good social management will need to go hand-in-hand with the development of high value-added industries.

**Conclusion**

India’s IT–software industry has achieved the advanced level of a developed country based on the conditions of a developing country, thus forming a national competitive edge. The history of India’s IT–software industry shows it achieved success through leapfrogging from the lower end of the industrial value chain to the higher end by pursuing an industrial strategy that is based more on competitive advantage rather than depending mainly on comparative advantage.

The success of India’s IT–software industry is based on the four aspects of Porter’s Diamond Model: (i) factor conditions; (ii) demand conditions; (iii) related and supporting industries; and (iv) company strategy, structure, and competition. The last three aspects are important for developing a country’s competitive edge, which is the key to success.

The success of India’s IT–software industry provides the following lessons for a developing country: (i) leapfrogging the industrial value chain is not only necessary but also feasible; (ii) in the current global international division of labor, depending only on comparative advantage will keep a country at the low end of the industrial value chain; and (iii) to realize such leapfrog development, a country must develop the high end of the industrial chain based on a competitive edge.

Thus, the two major policy implications for developing Asia are: (i) countries should make strategic decisions with a global perspective and aim to improve the country’s competitiveness to leapfrog the industrial value chain, and (ii) the government should play a proactive role to foster a national competitive edge by providing comprehensive support for the development of the IT–software industry. This includes preferential tax policies; access to finance; supply of quality human resources; better state planning; enhanced coordination and cooperation among entrepreneurs, government, and industry associations; and general improvement to the industry’s business environment, if necessary by according it a special status.

Thus *selection* has precedence over *gift*, and excellent leadership will make a difference.
300  Resurging Asian Giants: Lessons from the People’s Republic of China and India

References


Hu, Y. 2001. The Two Giants in the IT Industry of India. *Information of South-east and South Asia*.


Lan, J. 2002a. On the Educational Background of India’s IT Industry Development. *Study on Open Education*. (3).

———. 2002b. The Industrialization of IT Education in India. *Education and Vocation*. (2).


Ramanuja, P. R. The Evolution and Development of Open and Distance Education: Experiences from India. China Distance Education. (210).


Appendix

Table A.1: Production Value of India’s Electronics and Information Technology Industry, Fiscal Years 2004–2009 ($ million)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer electronics</td>
<td>3,307.83</td>
<td>3,739.02</td>
<td>4,065.64</td>
<td>4,416.48</td>
<td>5,616.16</td>
<td>5,660.21</td>
</tr>
<tr>
<td>Industrial electronics</td>
<td>1,327.48</td>
<td>1,847.26</td>
<td>1,987.64</td>
<td>2,296.57</td>
<td>2,959.67</td>
<td>2,774.57</td>
</tr>
<tr>
<td>Computers</td>
<td>1,479.82</td>
<td>1,958.54</td>
<td>2,439.38</td>
<td>2,826.55</td>
<td>3,943.74</td>
<td>2,937.91</td>
</tr>
<tr>
<td>Communication and broadcast equipment</td>
<td>1,164.27</td>
<td>1,068.29</td>
<td>1,581.08</td>
<td>2,097.83</td>
<td>4,647.00^b</td>
<td>5,662.39</td>
</tr>
<tr>
<td>Strategic electronics</td>
<td>598.46</td>
<td>667.68</td>
<td>722.78</td>
<td>993.71</td>
<td>1,416.47</td>
<td>1,489.64</td>
</tr>
<tr>
<td>Components</td>
<td>1,653.91</td>
<td>1,958.54</td>
<td>1,987.64</td>
<td>1,943.25</td>
<td>2,393.08</td>
<td>2,097.26</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>9,531.77</strong></td>
<td><strong>11,239.33</strong></td>
<td><strong>12,784.17</strong></td>
<td><strong>14,574.39</strong></td>
<td><strong>20,976.12^b</strong></td>
<td><strong>20,621.99</strong></td>
</tr>
<tr>
<td>Software for exports</td>
<td>12,674.21</td>
<td>17,844.94</td>
<td>23,512.94</td>
<td>31,136.21</td>
<td>40,853.86</td>
<td>47,106.74</td>
</tr>
<tr>
<td>Domestic software</td>
<td>3,536.33</td>
<td>4,838.48</td>
<td>6,685.71</td>
<td>8,170.49</td>
<td>11,682.12</td>
<td>12,463.79</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,742.30</strong></td>
<td><strong>33,922.75</strong></td>
<td><strong>42,982.82</strong></td>
<td><strong>53,881.10</strong></td>
<td><strong>73,512.09</strong></td>
<td><strong>80,192.52</strong></td>
</tr>
</tbody>
</table>

FY = fiscal year.

^a Estimated.

^b The rapid growth in hardware production in FY2008 is mainly due to the phenomenal growth of the communication and broadcasting equipment subsector.

Source: Ministry of Communications and Information Technology, Government of India 2009.  

Table A.2: Exports of India’s Electronics and Information Technology Industry, Fiscal Years 2004–2009 ($ million)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer electronics</td>
<td>178.45</td>
<td>255.95</td>
<td>451.74</td>
<td>331.24</td>
<td>397.60</td>
<td>–</td>
</tr>
<tr>
<td>Industrial electronics</td>
<td>328.61</td>
<td>333.84</td>
<td>519.50</td>
<td>662.47</td>
<td>964.19</td>
<td>–</td>
</tr>
<tr>
<td>Computers</td>
<td>313.37</td>
<td>267.07</td>
<td>230.39</td>
<td>331.24</td>
<td>246.02</td>
<td>–</td>
</tr>
<tr>
<td>Communication and broadcast equipment</td>
<td>37.00</td>
<td>77.90</td>
<td>112.93</td>
<td>143.54</td>
<td>154.07</td>
<td>–</td>
</tr>
<tr>
<td>Components</td>
<td>818.25</td>
<td>845.73</td>
<td>858.30</td>
<td>1,291.82</td>
<td>1,515.87</td>
<td>–</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>1,675.68</strong></td>
<td><strong>1,780.49</strong></td>
<td><strong>2,172.86</strong></td>
<td><strong>2,760.30</strong></td>
<td><strong>3,280.24</strong></td>
<td><strong>4,137.90</strong></td>
</tr>
<tr>
<td>Computer software</td>
<td>12,674.21</td>
<td>17,844.94</td>
<td>23,512.94</td>
<td>31,136.21</td>
<td>40,853.86</td>
<td>47,106.74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14,349.88</strong></td>
<td><strong>19,625.43</strong></td>
<td><strong>25,685.79</strong></td>
<td><strong>33,896.51</strong></td>
<td><strong>44,134.09</strong></td>
<td><strong>51,244.64</strong></td>
</tr>
</tbody>
</table>

– = data not available, FY = fiscal year.

^a Estimated.

Source: Ministry of Communications and Information Technology, Government of India 2009.
India, the second most populous country in the world, is home to one-sixth of humanity (Gupta 2004). It has also risen to become one of the world’s new economic giants. Its economy expanded during the 1980s to reach an annual growth rate of about 5.5% at the end of the decade, and surged ahead to reach a growth rate of 8.2% in fiscal year (FY)\(^2\) 2004 (World Bank 2005). According to the World Development Report, in terms of gross domestic product (GDP) India’s rank will rise from around eleventh in 2004 to the fourth highest position in 2020 (Gupta 2004).

The major contributor to this striking performance is India’s thriving services sector, led by information technology (IT). This sector’s expansion has far outstripped that of agriculture and industry. Services now account for more than half of India’s GDP (TERI 2004). Indians are justly proud of the rapid development of their IT sector which accounts for 30% of the worldwide software export market (Chen 2006). In 2000, more than half of the Fortune 500 companies outsourced to India. Many well-known firms have set up research and development facilities in the country or have tied up with Indian companies or academic and research institutions.\(^3\) According to the 2005 report of the National Association of Software and Services Companies (NASSCOM) and McKinsey, India is estimated to have a 65% share of the market in offshore IT. Moreover, there remains enormous potential for further growth in these markets (Smith 2007).

Why has India’s economy grown so quickly and how has it become one of the most important economic powers in the new world economic order in such a short time? The main factor behind the country’s current socioeconomic success is education—particularly higher and professional education. Without its advantage in higher and professional education created over the past 6 decades, India would not have become world-renowned for its large pool of technical and vocational labor, nor would it have achieved its current standing in the new economic world order.

This paper examines the development of India’s higher and professional education. It also attempts to examine the economic implications of this development and analyze the contribution of higher and professional education to the country’s rapid growth. Data from interviews, documents, literature, and publications are used to

---

\(^1\) Both authors are from the Graduate School of Education, Peking University. Sections one to three (pp. 307–324) were written by Shi Xiaoguang and sections four to six (pp. 325–339) by Yan Fengqiao.

\(^2\) The fiscal year (FY) of the Government of India runs from 1 April to 31 March. FY before a calendar year denotes the year in which the fiscal year begins, e.g., FY2007 begins on 1 April 2007.

\(^3\) These include Citicorp, Honeywell, Motorola, Sprint, Oracle, Verizon, Hughes Communications, Cisco Systems, Texas Instruments, British Telecom, SAP, Philips, Siemens, Yahoo, Google, Accenture, Sun Microsystems, Ericsson, IBM, Hewlett-Packard, Intel, Microsoft, and Nortel (Kaul 2006).
outline major changes, analyze the evolution and consequences of the process, and summarize India’s achievements. The paper focuses on how policies were formulated and the government’s initiatives to support the development of higher and professional education.

**Background and Overview**

The correlation between economic development and the development of higher education, and the paramount importance of higher education to economic and social development in the knowledge-based economy, are almost universally accepted (World Bank 1994). India’s successful model of economic development stands at least in part on the foundation built over time in its education sector. This large, complex system provides higher and professional education that reliably imparts useful, applicable skills and theoretical and practical knowledge on a large scale.

**Definition of Terms**

Broadly defined, the term “higher and professional education” in India’s context covers the full spectrum of education beyond the 12 years of formal schooling (Jayaram 2004). Generally, it comprises three levels of qualifications: bachelor or undergraduate degree programs, master’s or postgraduate degree programs, and the predoctoral and doctoral programs—master of philosophy and doctor of philosophy (Table 1).

**Table 1: Academic Structure of India’s Higher and Professional Education**

<table>
<thead>
<tr>
<th>Levels</th>
<th>Areas</th>
<th>Years of Education</th>
<th>Diploma or Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>General</td>
<td>1–3</td>
<td>Diploma</td>
</tr>
<tr>
<td></td>
<td>Arts, commerce, and science</td>
<td>3</td>
<td>Bachelor’s</td>
</tr>
<tr>
<td></td>
<td>Agriculture, dentistry, engineering, pharmacy, technology, veterinary medicine</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Architecture, medicine</td>
<td>5–5.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Law</td>
<td>3–5</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by the authors.

**Historical Perspectives**

Although education in ancient India was highly advanced and great centers of learning existed in the Buddhist monasteries from the 7th century BC to the 3rd century AD (Agarwal 2006), the modern higher education system dates from the mid-1850s and was founded by the British colonial administration. The three earliest universities were established at Madras (now Chennai), Calcutta (now Kolkata), and Bombay (now Mumbai) in 1857 (Dongaonkar 2004). These pioneer universities were mainly
affiliating and examining bodies that operated autonomously. They were modeled on
the University of London, which was established in 1836. They were also designed to
serve the economic, political, and administrative interests of the British and, in par-
ticular, to consolidate and maintain their dominance in the country (Jayaram 2004).

India’s independence in 1947 was a watershed in its modern social development.
It changed the higher education system, and this has since grown and improved
steadily (Thorat 2006). The number of universities in India increased from 20 in
1948 to about 355 in 2006—an 18-fold increase. The number of colleges increased
from 496 in 1948 to 18,064 in 2006. The number of university-level teachers grew
from 24,000 in 1951 to 488,000 in 2006 (Table 2).

The fastest growth in institutions was in the 1950s and 1960s, reflecting the small
educational base in 1948 and the ambitious expansion that independence sparked.
Growth was relatively slow in the 1970s and 1980s, but picked up again from the
1990s onward because of increased demand for higher education, particularly in IT
(Table 2).

Table 2: Growth of Institutions, Enrollment, and Teaching Faculty at Higher Education
Institutions in India, 1948–2006

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Universities*</th>
<th>Colleges</th>
<th>Total Higher Education Institutes</th>
<th>Enrollment ('000)</th>
<th>Teachers ('000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947–1948</td>
<td>20</td>
<td>496</td>
<td>516</td>
<td>100</td>
<td>...</td>
</tr>
<tr>
<td>1950–1951</td>
<td>28</td>
<td>578</td>
<td>606</td>
<td>174</td>
<td>24</td>
</tr>
<tr>
<td>1960–1961</td>
<td>45</td>
<td>1,819</td>
<td>1,864</td>
<td>557</td>
<td>62</td>
</tr>
<tr>
<td>1970–1971</td>
<td>93</td>
<td>3,227</td>
<td>3,370</td>
<td>1,956</td>
<td>190</td>
</tr>
<tr>
<td>1980–1981</td>
<td>123</td>
<td>4,738</td>
<td>4,861</td>
<td>2,752</td>
<td>244</td>
</tr>
<tr>
<td>1990–1991</td>
<td>184</td>
<td>5,748</td>
<td>5,932</td>
<td>4,925</td>
<td>271</td>
</tr>
<tr>
<td>2000–2001</td>
<td>266</td>
<td>11,146</td>
<td>11,412</td>
<td>8,399</td>
<td>395</td>
</tr>
<tr>
<td>2004–2005</td>
<td>348</td>
<td>17,625</td>
<td>17,973</td>
<td>10,481</td>
<td>472</td>
</tr>
<tr>
<td>2005–2006</td>
<td>355</td>
<td>18,064</td>
<td>18,419</td>
<td>11,028</td>
<td>488</td>
</tr>
</tbody>
</table>

* = no data.
* Universities include central, state, private, deemed universities, and institutions of importance established both by
the central and the state legislatures.


**Major Characteristics and Trends**

**Establishment of a Unique, Differentiated System**

India has established a very large, complex, and modern system of higher and profes-
sional education. It inherited the British model but developed an Indian style of its own.
The higher education system is largely based on the practice of affiliation, which was
started by the University of London. In this system, a university sets out the courses,
conducts examinations, and awards credentials; and a number of affiliated colleges do
the teaching. The other remarkable feature is the diversity within the system, with dif-
ferent types of institutions created to meet diverse needs.
India’s institutions of higher and professional education can be classified in several ways. They are divided by title into universities, institutes of national importance, and colleges. They are owned either by the national or state governments or privately—in which case, they may either be aided (i.e., they receive government financial support), or they may be unaided. Depending on how they function, they can be affiliating universities, teaching-cum-affiliating universities, unitary universities, federal universities, or open universities. Institutions may have a single faculty or several faculties; they may have a single campus or multiple campuses, and may be autonomous or affiliated.

Overall, there are three main groups of higher educational establishments: universities, colleges, and institutes (Bhatnagar 2007; Lal and Sinha 2007). In 2006, there were 20 universities financed by the central government, 216 universities financed by state governments, 101 institutions deemed to be universities, 13 institutes of national importance established through central legislation, and 5 private institutions established through state legislation (Table 3).

Table 3: Types of Higher Educational Institutes in India, Academic Year 2005–2006

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td></td>
</tr>
<tr>
<td>Central universities</td>
<td>20</td>
</tr>
<tr>
<td>State universities</td>
<td>216</td>
</tr>
<tr>
<td>Deemed universities</td>
<td>45</td>
</tr>
<tr>
<td>Private deemed universities</td>
<td>56</td>
</tr>
<tr>
<td>Private universities</td>
<td>5</td>
</tr>
<tr>
<td>Institutes of national importance</td>
<td>13</td>
</tr>
<tr>
<td>Subtotal</td>
<td>355</td>
</tr>
<tr>
<td>Colleges</td>
<td></td>
</tr>
<tr>
<td>Affiliated colleges</td>
<td>17,850</td>
</tr>
<tr>
<td>Autonomous colleges</td>
<td>214</td>
</tr>
<tr>
<td>Total</td>
<td>18,419</td>
</tr>
</tbody>
</table>


There are four types of universities: central universities, state universities, deemed universities (which can be either aided or unaided), and private universities. Central universities (which are established, maintained, and funded by the national government) and state universities (which are established, maintained, and funded by the state governments) fall into three further categories:

(i) **Affiliating universities.** Their function is to hold examinations in the colleges affiliated to them. The task of teaching is performed by the affiliated colleges.

(ii) **Unitary universities.** These universities exercise complete control over the colleges located on their campuses. Teaching is conducted either by university-appointed teachers or teachers working under the supervision of the universities.

(iii) **Federal universities.** These universities have colleges linked to them near the university that provide education under the guidance of the university (Bhatnagar 2007).

Five of India’s universities are identified as “universities with potential for excellence.” Table 4 shows their areas of concentration.
Table 4: Areas of Concentration of Universities with Potential for Excellence

<table>
<thead>
<tr>
<th>University</th>
<th>Area of Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madras University</td>
<td>Herbal sciences</td>
</tr>
<tr>
<td>Jadavpur University</td>
<td>Mobile computing and communication</td>
</tr>
<tr>
<td>Pune University</td>
<td>Biochemistry and biotechnology</td>
</tr>
<tr>
<td>Hyderabad University</td>
<td>Interface studies and research</td>
</tr>
<tr>
<td>Jawaharlal Nehru University</td>
<td>Genetics, genomics, and biotechnology</td>
</tr>
</tbody>
</table>


Deemed universities are unique to India. Autonomous private institutions of higher education and learning had been developed in the country before independence and the Education Commission headed by Dr. Radhakrishnan recommended in 1948 that they be recognized as universities. The Government of India did so in some cases in 1956, under a provision under section 3 of the University Grants Commission Act of 1956 (Chakrabarti 2007). Administered and funded by either founder managing agencies or the central government, deemed universities usually either specialize in an area of knowledge or are heirs to a certain tradition. They have no affiliated colleges and are not expected to become multidisciplinary universities (Jayaram 2004). Some of the deemed universities receive central government grants for administrative and development expenditure, others receive grants only for development expenditure.

India’s institutions of national importance have been accorded special status for their professional and technical standards. They are the country’s crown jewels of higher education and research, and are autonomous and outside the control of the University Grants Commission (UGC). These institutions have their own curricula, academic calendars, and faculty compensation systems; and their funding structures differ from the norm. Admission is highly competitive. The seven Indian Institutes of Technology (IITs), the All India Institute of Medical Sciences, and the Indian Institutes of Management (IIMs) are all part of this group. Some of these university-level institutions award diplomas known as “fellowships,” rather than degrees, although their diplomas are treated as equivalent to university degrees (Jayaram 2004).

The vast majority of India’s colleges are affiliated with universities. They are widely dispersed throughout their states and regions but have common syllabi. Their students undertake common annual examinations which are usually conducted by the affiliating university (Agarwal 2007b). Only 214 of India’s colleges were autonomous in 2006 (Table 3). They were connected to 47 universities in 13 states but had been granted autonomy in terms of academic self-governance because of their proven record of academic excellence and efficient administration. Existing affiliated or constituent colleges are granted autonomy in stages after assessment by professional accreditation bodies. A review of the performance of these colleges has been institutionalized so that they are granted university status after meeting the given standards of academic and administrative performance.

**The Development of World-Class Technical Education**

The national autonomous institutions of higher learning represent the most successful area of India’s higher education. Many excellent institutions of technical education,
such as the IITs and IIMs, are well known around the world for their high standards. Their graduates are in demand both at home and abroad. The establishment of these high-quality institutions—particularly the IITs—is considered a masterstroke by many (Agarwal 2007b). Table 5 shows the location and specializations of India’s institutes of technical education.

Table 5: Indian Institutes of Technical Education

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian Institutes of Technology (IITs)</td>
<td>Delhi, Kanpur, Kharagpur, Chennai, Mumbai, Guwahati, Roorkee</td>
<td>Engineering and technology</td>
</tr>
<tr>
<td>Indian Institute of Science</td>
<td>Bangalore</td>
<td>Science and engineering</td>
</tr>
<tr>
<td>Indian Institute of Science Education and Research</td>
<td>Pune, Kolkata, Mohali</td>
<td>Physics, chemistry, mathematics, environment, and earth and computer science</td>
</tr>
<tr>
<td>National Institutes of Technology</td>
<td>17 regions</td>
<td>Engineering</td>
</tr>
<tr>
<td>State colleges and university departments</td>
<td></td>
<td>Technical and engineering education</td>
</tr>
<tr>
<td>National Institute of Design</td>
<td>Ahmedabad, Gandhinagar, Bangalore</td>
<td>Industrial design, communication design, textile design</td>
</tr>
<tr>
<td>Indian Institute of Information Technology</td>
<td>Allahabad, Bangalore, Delhi, Jabalpur, Hyderabad, Pune</td>
<td>Computer science, electronics</td>
</tr>
<tr>
<td>Indian Institutes of Management (IIMs)</td>
<td>Ahmedabad, Kolkata, Bangalore, Lucknow, Indore, Kozhikode</td>
<td>Management education and training, and conducting research, consultancy for the industry</td>
</tr>
<tr>
<td>National Institute of Industrial Engineering</td>
<td>Mumbai</td>
<td>Industrial engineering education</td>
</tr>
<tr>
<td>National Institute of Foundry and Forge Technology</td>
<td>Ranchi</td>
<td>Advanced foundry and forge techniques education</td>
</tr>
<tr>
<td>Indian School of Mines</td>
<td>Dhanbad</td>
<td>Mining, applied geology, petroleum technology, and geophysics</td>
</tr>
<tr>
<td>National Institute of Technical Teachers’ Training and Research</td>
<td>Bhopal, Kolkata, Chandigarh, Chennai</td>
<td>Serving teachers of polytechnics</td>
</tr>
<tr>
<td>Sant Longowal Institute of Engineering and Technology</td>
<td>Longowal, Punjab (also Jalandhar)</td>
<td>Technical education, engineering and technology</td>
</tr>
<tr>
<td>School of Planning and Architecture</td>
<td>Delhi</td>
<td>Rural and urban planning, human settlement, architecture</td>
</tr>
<tr>
<td>North Eastern Regional Institute of Science and Technology</td>
<td>Itanagar</td>
<td>Science and technology education</td>
</tr>
<tr>
<td>Central Institute of Technology</td>
<td>Kokrajhar, Assam</td>
<td>Electronics and communication engineering, computer engineering, food processing technology, instrumentation and control</td>
</tr>
</tbody>
</table>

Note: The government is in the process of establishing or soon plans to establish (i) eight more IITs in Bhubaneswar, Gandhinagar, Guwahati, Hyderabad, Indore, Mandi, Patna, Punjab, and Rajasthan; and (ii) eight more IIMs in Tiruchirappalli, Ranchi, Raipur, Rohtak, Shillong, Jammu and Kashmir, Uttarakhand, and Rajasthan.

Technical education in India dates from 1794. It began with certificate programs, progressed to diplomas, and, in the second half of the 19th century, to bachelor degrees and postgraduate degrees in technical fields (Kulandai Swamy 1995). Technical education has expanded since independence, and it now offers opportunities for education and training in a wide variety of trades and disciplines at certificate, diploma, degree, postgraduate, and doctoral levels in institutions located throughout the country (World Bank 2002). In academic year 1947–1948, India had 100 industrial training institutes, 53 diploma-level polytechnics with an intake capacity of 2,500 students, and 38 degree-level engineering colleges with an intake capacity of 3,670 students. Postgraduate education in engineering is essentially a post-independence phenomenon, as the intake for postgraduates was only 70 at the time of independence (World Bank 2002).

Technical education and vocational training are considered important elements of the nation’s education initiative. However, if they are to play their part effectively in the changing national context and if India is to enjoy the fruits of the demographic dividend, the critical elements of vocational education must be redefined to make it flexible, contemporary, relevant, inclusive, and creative.

These important institutions are making efforts to integrate university and vocational education. In a recent innovation, a vocational curriculum has been introduced at the bachelor degree level, with one in three subjects vocational, including courses related to agriculture. Nearly 1,500 colleges have been given facilities for vocational education. Table 6 shows the growth of institutions of engineering and technology.

Indian technical and vocational education focuses on engineering, technology, management, architecture, and pharmacy, and represents a distinct stream of higher education in the country. It spans the entire spectrum of skills requirements, covering craftsmen, technicians, and technologists; and provides certificates, diplomas, and post-diplomas, bachelor degrees, and postgraduate degrees (including postgraduate diploma, Master’s of Technology, and Doctor of Philosophy). The network of public and private polytechnics and vocational institutions that deliver this higher education is controlled and supervised by councils specializing in each discipline.

### Table 6: Number of Engineering and Technology Institutions, 1947–1989

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Institutions</th>
<th>Doctorate degree</th>
<th>Master’s degree</th>
<th>Postgraduate diploma</th>
<th>Bachelor’s degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>46</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>1950</td>
<td>55</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>53</td>
</tr>
<tr>
<td>1955</td>
<td>80</td>
<td>1</td>
<td>14</td>
<td>2</td>
<td>74</td>
</tr>
<tr>
<td>1960</td>
<td>115</td>
<td>2</td>
<td>27</td>
<td>5</td>
<td>111</td>
</tr>
<tr>
<td>1965</td>
<td>151</td>
<td>7</td>
<td>37</td>
<td>9</td>
<td>144</td>
</tr>
<tr>
<td>1970</td>
<td>163</td>
<td>20</td>
<td>62</td>
<td>14</td>
<td>155</td>
</tr>
<tr>
<td>1980</td>
<td>226</td>
<td>41</td>
<td>94</td>
<td>19</td>
<td>216</td>
</tr>
<tr>
<td>1985</td>
<td>358</td>
<td>58</td>
<td>115</td>
<td>16</td>
<td>347</td>
</tr>
<tr>
<td>1989</td>
<td>383</td>
<td>74</td>
<td>143</td>
<td>17</td>
<td>372</td>
</tr>
</tbody>
</table>

Certificate programs, which aim at producing skilled workers, are offered in industrial training institutions that require 10 years of basic education for entry; diploma programs are available in polytechnic-level institutions; and degrees the domain of affiliated colleges, university departments, technical universities, and deemed universities. Table 7 provides a more detailed breakdown.

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Diploma programs</th>
<th>Government polytechnics, aided private polytechnics, self-financing private polytechnics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Degree programs</td>
<td>Indian Institutes of Technology and Indian Institutes of Science, technical universities including deemed universities, university departments of engineering and technology, regional engineering colleges, government engineering colleges, aided private engineering, professional associations offering programs equivalent to degree, other special institutions</td>
</tr>
<tr>
<td>Management</td>
<td>Postgraduate diploma and master of business administration</td>
<td>Indian Institutes of Management; university departments; affiliated colleges (government, aided private, and unaided private); autonomous private institutes</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>Diploma and/or degree</td>
<td>Pharmacy colleges, university departments, affiliated colleges</td>
</tr>
<tr>
<td>Planning and architecture</td>
<td>Bachelor’s and/or master’s degree</td>
<td>School of Planning and Architecture; university departments; affiliated colleges (government, aided private, and unaided private)</td>
</tr>
</tbody>
</table>


In addition, by 2007 India had more than 5,000 industrial training institutes that can accept up to 600,000 students a year, mostly in classes set up for 2-year diploma courses. Each year another 200,000 Indians undergo apprenticeships in state-run enterprises. When those taking applied courses in agriculture, engineering, and other professional subjects are included, the average annual student population in job-related training numbers 1.7 million, equivalent to 14% of annual entrants to the workforce.

The Role of Regulatory and Support Agencies
Governments play an important role in promoting and administrating higher education institutions in India through agencies set up for this purpose. The most important are the National Planning Commission, UGC, the Central Advisory Board of Education (CABE), and the coordinating councils that are concerned with professional disciplines (Pinto 1984).

The National Planning Commission is an advisory body established in 1938 to formulate and oversee the implementation of 5-year plans to guide national economic and social development including education provision. Education is a concurrent responsibility of the national and state governments under the Constitution of India, and planning is done at the national and state levels. The Commission, in collaboration with the Ministry of Education, prepares a national educational development
Higher and Professional Education in India

plan in two parts: one deals with the national government’s direct responsibilities in education (which include financial assistance to state governments for educational development in specific areas known as the centrally sponsored schemes); and the other is an integrated summary of the states’ educational development plans. State planning and education departments prepare detailed overall plans for primary, secondary, and higher secondary education in their jurisdictions. Planning for universities is left to the universities themselves, together with UGC (Pinto 1984).

UGC is the most important statutory, advisory, and executive education body in India and is a grant-giving education agency. It evolved from the University Grants Committee which was founded in 1945 to make financing recommendations to the Ministry of Education. In 1948, the University Grants Committee was given a full-time chairperson, and was renamed the University Grants Commission (UGC). The University Grants Commission Act of 1956 provided the general legal and institutional framework and defines the major duties and basic functions of the Commission. An amendment in 1972 empowered UGC to provide general and specific purpose assistance to all universities (Pinto 1984).

Today, UGC provides grants to universities and colleges controlled by the central government; and it coordinates, determines, and maintains standards in the institutions of higher education. Its mandate includes promoting and coordinating university education; determining and maintaining standards of teaching, examination, and research in universities; framing regulations on minimum standards of university education; monitoring developments in the field of collegiate and university education; disbursing grants to the universities and colleges; advising the central and state governments on measures to improve university education; and promoting professional institutions.

CABE, which was established to find ways to promote autonomy and accountability in India’s higher education, provided a wide range of recommendations in 2005. So far, however, CABE report has not yielded tangible results.4

Table 8 lists the regulatory and statutory bodies involved in promoting higher education in India, and their main functions.

India’s higher education system and policies are becoming fragmented due to the many mandates, powers, and responsibilities of the various regulatory and statutory bodies. These sometimes diverge but can also overlap with those of UGC, other professional councils, and even in some instances the universities themselves. In 2009, the government announced plans to set up a national council for higher education to reform regulatory institutions and create greater cohesion in higher education.

Factors Behind the Success of Higher and Professional Education in India

India’s higher and professional education system is one of the largest in the world, and, in the case of IT, one of the best. In 2005, India had 145,517 certified software professionals—more than any country except the United States (US), which had 194,211. The size of the Indian software cohort was 30 times that of Germany, the

---

<table>
<thead>
<tr>
<th>Name</th>
<th>Main Role</th>
<th>Overlaps with the role of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Grants Commission (UGC)</td>
<td>Funding, recognition of institutions and degree titles, maintaining overall standards</td>
<td>Other professional councils and the Distance Education Council (DEC)</td>
</tr>
<tr>
<td>Distance Education Council (DEC) under the IGNOU Act</td>
<td>Funding open education and maintaining standards</td>
<td>Other professional councils and UGC</td>
</tr>
<tr>
<td>All India Council for Technical Education (AICTE)</td>
<td>Approval for technical institutions and limited funding role for quality improvement</td>
<td>UGC, DEC, Pharmacy Council of India, Council of Architecture and the state councils for technical education</td>
</tr>
<tr>
<td>Council of Architects</td>
<td>Registration of architects and recognition of institutions for education in architecture and town planning</td>
<td>AICTE</td>
</tr>
<tr>
<td>Medical Council of India</td>
<td>Registration of medical practitioners and recognition of medical institutions and qualifications</td>
<td>State medical councils and the state governments; UGC and DEC to a limited extent</td>
</tr>
<tr>
<td>Pharmacy Council of India</td>
<td>Registration of pharmacists and approval of pharmacy institutions</td>
<td>AICTE and state pharmacy councils</td>
</tr>
<tr>
<td>Indian Nursing Council</td>
<td>Accepts qualifications awarded by universities within and outside India</td>
<td>22 state nursing councils with different Acts have registering powers</td>
</tr>
<tr>
<td>Dental Council of India</td>
<td>Recommend to the central government for approval of dental colleges, etc.</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>Central Council of Homeopathy</td>
<td>Maintain Central Register of Homeopathy</td>
<td>State councils</td>
</tr>
<tr>
<td>Central Council of Indian Medicine</td>
<td>Maintain central register</td>
<td>State councils</td>
</tr>
<tr>
<td>Rehabilitation Council of India</td>
<td>Recognition of institutions for physiotherapy and related fields</td>
<td>State governments</td>
</tr>
<tr>
<td>National Council for Teacher Education</td>
<td>Recognition of teacher education institutions</td>
<td>DEC</td>
</tr>
<tr>
<td>Indian Council for Agricultural Research*</td>
<td>Coordinate and fund agricultural education</td>
<td>UGC</td>
</tr>
<tr>
<td>Bar Council of India</td>
<td>Listing of Members of Bar</td>
<td>State bar councils</td>
</tr>
</tbody>
</table>

IGNOU = Indira Gandhi National Open University.

* Not a statutory body.

Source: Agarwal 2007a.
European leader, and 100 times the total certified software workforce of the People’s Republic of China (PRC). Setting the US aside, India’s lead in software is overwhelming (Kaul 2006). The country’s record levels of economic growth have been powered to a great extent by the IT-based expansion made possible by this resource.

Broad access to higher education and the rapid growth of enrollment at its universities and colleges have played a key role in India’s rapid, sustained economic advances. The success of the Indian economic model therefore owes much to India’s successful model of higher education. But what are the factors behind the success of higher and professional education in India?

**Meeting the needs of Socioeconomic Development**

A country’s higher education system should reflect and respond seamlessly to its changing conditions and needs through flexible systems of teaching and learning. The nature of these needs is likely to vary in terms of disciplines and specialties at different stages of economic development. As the economy evolves from agriculture, to manufacturing, and services, new demands are placed on its higher education system. Table 9 shows the number and proportion of students enrolled in the spectrum of higher education disciplines in India.

<table>
<thead>
<tr>
<th>Disciplines</th>
<th>Enrollment</th>
<th>Share of Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts</td>
<td>4,976,946</td>
<td>45.1</td>
</tr>
<tr>
<td>Science</td>
<td>2,255,230</td>
<td>20.4</td>
</tr>
<tr>
<td>Commerce and management</td>
<td>1,986,146</td>
<td>18.0</td>
</tr>
<tr>
<td>Education</td>
<td>161,009</td>
<td>1.5</td>
</tr>
<tr>
<td>Engineering and technology</td>
<td>795,120</td>
<td>7.2</td>
</tr>
<tr>
<td>Medicine</td>
<td>348,485</td>
<td>3.2</td>
</tr>
<tr>
<td>Agriculture</td>
<td>63,962</td>
<td>0.6</td>
</tr>
<tr>
<td>Veterinary science</td>
<td>16,542</td>
<td>0.1</td>
</tr>
<tr>
<td>Law</td>
<td>336,356</td>
<td>3.1</td>
</tr>
<tr>
<td>Others</td>
<td>88,224</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,028,020</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Higher and professional education is critical for the building of knowledge economies. India currently produces a solid core of knowledge workers in tertiary and scientific and technical education, but it needs to do more to create a larger cadre of educated, flexible workers who can adapt and use knowledge for innovation and improved productivity. India’s knowledge sector today is the equal of those of the world’s top economies. This is an opportune time for India to make its transition to a knowledge economy—an economy that creates, disseminates, and uses knowledge to enhance its growth and development. To achieve this, the higher education system...
needs to be adapted to make it more relevant, demand driven, quality conscious, and forward-looking. It must also be able to retain its top talent to meet new and emerging economic needs.

**Government’s Initiatives**

Prior to the reforms of 1991, India had a planned economy; however, the economy has since become market driven. Although the market has a great influence on India’s higher education, the central and state governments play important roles. The central government is in charge of more than 20 central universities, and state governments manage the provincial universities and colleges. The main roles of the state and central governments in India are as follows.

**Planning and Regulating**

The planning of the education system is done at both the national and state levels by appointing commissions and committees to study and report on important issues. These reports guide and regulate policy on matters such as future development, governance, and teacher pay scales at universities and colleges.

The newly independent Government of India created the country’s first official department for higher education in 1948—the University Education Commission, also known as the Radhakrishnan Commission. It was affiliated with the Ministry of Education and took on the task of making proposals for the future expansion and improvement of higher education.\(^5\) The Kothari Commission (1964–1966)\(^6\) was established to develop a blueprint for a national system of education. It conducted India’s first comprehensive investigation into all aspects and issues facing education, including those at the higher and professional levels.

In 1985, the new Congress Party government embarked on the complex task of restructuring the education system, and the Ministry of Education—since reorganized as the Ministry of Human Resource Development—presented a 119-page policy document to Parliament that highlighted higher education because it “can provide ideas and men to give shape to the future and also sustain all other levels of education.”\(^7\) The Report of the Punnaya Committee (1992–1993), which redefined the role of UGC, was another landmark document in the history of India’s modern education (Table 10) (Aggarwal 2006).

The two agencies most important today to the regulation and administration of higher education institutions in India remain UGC and the All India Council for Technical Education, both of which are overseen by the Ministry of Human Resource Development.

**Financing**

Different countries finance higher education in different ways. In India, higher education has generally been recognized as a public good, or at least a quasi-public good

---

Table 10: Higher Education Landmarks in the History of Modern India

<table>
<thead>
<tr>
<th>Year</th>
<th>Committee or Commission (reports)</th>
<th>Major Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948–1949</td>
<td>University Education Commission</td>
<td>Defining aims of university education</td>
</tr>
<tr>
<td>1956–1957</td>
<td>Sanskrit Commission</td>
<td>Providing teaching and research in Sanskrit universities</td>
</tr>
<tr>
<td>1964–1966</td>
<td>Kothari Commission</td>
<td>Dealing with vocational, technical, and engineering education</td>
</tr>
<tr>
<td>1968</td>
<td>Education Commission</td>
<td>Dealing with science education and research, education for agriculture, university education, and adult education</td>
</tr>
<tr>
<td>1968</td>
<td>Educational Planning Administration and Evaluation</td>
<td>Dealing with comprehensive educational plans, establishment of national staff college, educational research</td>
</tr>
<tr>
<td>1967–1969</td>
<td>Committee on Rural Higher Education</td>
<td>Dealing with administrative structure, teaching media, extension and research, teachers’ salary, establishment of rural institutes</td>
</tr>
<tr>
<td>1963–1973</td>
<td>Committee on Governance of Universities and Colleges</td>
<td>Dealing with faculty payment and code of conduct</td>
</tr>
<tr>
<td>1978</td>
<td>Development of Higher Education in India: A Policy Framework</td>
<td>Summarizing achievement and failure, discussing conditions essential for success, providing standard of access</td>
</tr>
<tr>
<td>1986</td>
<td>National Policy on Education</td>
<td>Dealing with national system of education, vocationalization—higher education, Open University and distance learning, technical and management education, research and development</td>
</tr>
<tr>
<td>1986</td>
<td>Program of Action</td>
<td>Covering higher education; Open University and distance education; rural university and institutes; research and development, technical and management education</td>
</tr>
<tr>
<td>1983–1986</td>
<td>Committee on Revision of Pay Scales of Teachers in Universities and Colleges</td>
<td>Revising pay scale of teachers in universities and colleges</td>
</tr>
<tr>
<td>1988</td>
<td>National Expert Committee</td>
<td>Grading for technical teacher and action thereon</td>
</tr>
<tr>
<td>1988</td>
<td>Committee on Accreditation and Assessment Council</td>
<td>Providing issues on establishment of accreditation system</td>
</tr>
<tr>
<td>1992</td>
<td>CABE Committee or Janardhanna Reddy Committee</td>
<td>Dealing with adult and continuing education; higher education and management of education</td>
</tr>
<tr>
<td>1992–1993</td>
<td>Punnaya Committee</td>
<td>Dealing with issues of funding of higher education</td>
</tr>
<tr>
<td>1993</td>
<td>CABE Committee</td>
<td>Dealing with decentralized management of education</td>
</tr>
<tr>
<td>1995</td>
<td>IIT Synergy Sub-Group</td>
<td>Dealing with development of education at IIT</td>
</tr>
<tr>
<td>1994–1997</td>
<td>Pay Review Committee or Rastogi Committee</td>
<td>Dealing with recruitment and minimum qualifications for lecturers, and pay scale</td>
</tr>
</tbody>
</table>

CABE = Central Advisory Board on Education, IIT = Indian Institutes of Technology, UGC = University Grants Commission.

Source: Compiled by authors from publications including Aggarwal 2006.
Resurging Asian Giants: Lessons from the People’s Republic of China and India

(Ministry of Human Resource Development 2005), and government has therefore assumed most of the responsibility for funding. The bulk of this spending goes to the central universities, state universities, and deemed universities in the form of maintenance or developmental grants from UGC or organizations and management committees at the state level (Lal and Sinha 2007). Most of the public institutions are administrated by the state governments, which pay for up to 90% of their operating costs (Kaul 2006).

UGC, as the central government’s main funding agency for higher education, uses almost 65% of its budget to finance the operating expenses of the central universities. The remaining 35% is spent on the system at large. All private, unaided universities and colleges are expected to meet all their expenses from their own revenue sources (mostly tuition). Many institutions that qualify for grants from their state governments are not eligible for UGC funding (Agarwal 2006). In FY2004, the total central and state government budget for higher education, including technical education, was Rs131.37 billion (Table 11).

Table 11: Public Expenditure on Higher Education in India, Fiscal Year 2004 (Rs billion)

<table>
<thead>
<tr>
<th>Source of Expenditure</th>
<th>Breakdown</th>
<th>Higher Education</th>
<th>Technical Education</th>
<th>Other</th>
<th>Total Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central government</td>
<td>Plan</td>
<td>6.40</td>
<td>7.50</td>
<td>0.65</td>
<td>14.55</td>
</tr>
<tr>
<td></td>
<td>Non-plan*</td>
<td>11.57</td>
<td>8.45</td>
<td>0.45</td>
<td>20.47</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>17.97</td>
<td>15.95</td>
<td>1.10</td>
<td>35.02</td>
</tr>
<tr>
<td>State governments</td>
<td>Plan</td>
<td>4.94</td>
<td>5.41</td>
<td>1.25</td>
<td>9.15</td>
</tr>
<tr>
<td></td>
<td>Non-plan</td>
<td>72.72</td>
<td>12.52</td>
<td>4.02</td>
<td>87.20</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>77.66</td>
<td>17.93</td>
<td>5.27</td>
<td>96.35</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>95.63</td>
<td>33.88</td>
<td>6.37</td>
<td>131.37</td>
</tr>
</tbody>
</table>

* The education budget is generally divided into plan and non-plan expenditure. Anticipated budgets of new programs and projects approved by the Planning Commission are included in plan expenditures, while the budget for ongoing programs and projects are included in non-plan expenditures. Capital investment comes from plan expenditure while operating and maintenance generally fall under non-plan expenditure.


Public financing for higher and professional education in India increased by 4 times in nominal terms between FY1990 and FY2004 (Table 13). But growth has been erratic at times and has slowed recently. Spending at constant prices rose at a rate of 7.5% in the 1950s and enjoyed a golden period in 1960s when it reached 11%. It suffered a severe setback during the 1970s, when it declined to 3.4%. Spending again rose by 7.3% a year in nominal terms in the 1980s and from Rs23,120 million to Rs96,620 million in current prices from FY1990 to FY2004—an annual growth rate of 12.3%. However, rising inflation made this increase illusory. For instance, adjustment for inflation yields a real rate of increase of only 5.4%. This translates into a decrease in expenditure per student during this period (Prakash 2007) (Table 12).
Evaluating Performance

The rapid expansion of higher education in India in the 1980s was achieved at the expense of quality. Some institutions, such as the IITs, the All India Institute of Medical Sciences, and a few central universities and affiliated colleges, maintained their high standards, but many state universities and colleges did not. This problem forced the central government to implement new initiatives (Agarwal 2006).

In the 1990s, the central government established quality assurance agencies to evaluate the performance of institutions of higher education and introduce a measure of accountability. UGC set up the National Accreditation and Assessment Council (NAAC) in 1994, the year that also marked the formation of the National Board of Accreditation by the All India Council for Technical Education. The Accreditation Board, established by the Indian Council of Agricultural Research, followed in 1996.

NAAC is an autonomous body responsible for periodic assessments of universities and colleges. Its methodology couples a self-appraisal by the university or college with an assessment of the institution’s performance by an expert peer committee. Although it began work in 1998, NAAC has picked up the pace of its activities only in recent years (Figure 1). By 2005, it had accredited 105 universities and 2,311 colleges—mostly public institutions that receive government aid. Private, unaided institutions have been less willing to subject themselves to NAAC assessment (Agarwal 2006).

### Table 12: Budget Expenditure on Higher Education, Fiscal Years 1990–2004 (Rs million)

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Budget Expenditure (Rs million)</th>
<th>Expenditure per Student (Rs)</th>
<th>Index of Spending per Student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current Prices</td>
<td>Constant Prices</td>
<td>Current Prices</td>
</tr>
<tr>
<td>1990</td>
<td>23,120</td>
<td>31,400</td>
<td>5,652</td>
</tr>
<tr>
<td>1993</td>
<td>31,040</td>
<td>31,040</td>
<td>6,738</td>
</tr>
<tr>
<td>1994</td>
<td>35,250</td>
<td>32,170</td>
<td>7,329</td>
</tr>
<tr>
<td>1996</td>
<td>42,880</td>
<td>33,430</td>
<td>7,207</td>
</tr>
<tr>
<td>1997</td>
<td>48,590</td>
<td>35,500</td>
<td>7,793</td>
</tr>
<tr>
<td>1998</td>
<td>61,170</td>
<td>41,370</td>
<td>9,536</td>
</tr>
<tr>
<td>1999</td>
<td>82,480</td>
<td>53,710</td>
<td>10,683</td>
</tr>
<tr>
<td>2000</td>
<td>91,950</td>
<td>57,880</td>
<td>10,543</td>
</tr>
<tr>
<td>2001</td>
<td>80,880</td>
<td>49,230</td>
<td>9,669</td>
</tr>
<tr>
<td>2002</td>
<td>88,600</td>
<td>51,790</td>
<td>9,310</td>
</tr>
<tr>
<td>2003</td>
<td>93,810</td>
<td>53,250</td>
<td>–</td>
</tr>
<tr>
<td>2004</td>
<td>96,620</td>
<td>51,520</td>
<td>–</td>
</tr>
<tr>
<td>% growth rate</td>
<td>12.3</td>
<td>5.4</td>
<td>5.6</td>
</tr>
</tbody>
</table>

( ) = negative number, – = data not available, Rs = rupees.

* At fiscal year 1993 prices.

Sources: Analysis of Budget Expenditure on Education, Ministry of Human Resource Development, various years; Government of India, Selected Educational Statistics, various years.
NAAC generally follows a three-stage accreditation process in which the institution first prepares and submits its self-study report; then the peer team visits to validate the self-study report, makes its own assessment, and prepares its recommendations; and finally the NAAC executive council considers these inputs and determines the rating. NAAC bases its decisions on evaluations on seven areas: curriculum; the quality of learning and teaching; research, consultancy, and extension; infrastructure and learning resources; student support and progression; organization and management; and good practices (Prasad and Stella 2004).

The National Board of Accreditation approves technical institutions, while the Accreditation Board provides similar quality assurance for agriculture institutions (Agarwal 2006).

Response to Market Forces

Since India launched its economic reforms in 1991, market forces have begun to affect the education sector. The reforms have considerably accelerated economic growth and stimulated demand for education in disciplines such as management, engineering, medicine, and computing; and have raised concerns about access to the poor, gender equity, quality, and regulation in higher education (Prakash 2007). This demand has in turn affected the number of undergraduate courses offered by public institutions in engineering and technology, medicine, and teacher education, and postgraduate courses in computer applications and management (Agarwal 2007b).

Figure 2 shows the growth of higher education institutions in India between academic year 2000–2001 and academic year 2005–2006, and illustrates in particular how the number of private institutions—especially unaided private institutions—has increased significantly, while the number of public institutions has risen only slightly.
Unaided private institutions have also accounted for most of the growth in enrollment, with nearly 30% of students now attending these institutions (Figure 3) (Agarwal 2006). These schools tailor their course offerings to the areas of high market demand. Private institutions account for more than 80% of students enrolling in professional courses. The emergence of private higher education in India has added a valuable occupational focus to the growth of higher education in the country and provided dynamism at a time when it was becoming inflexible.

Although precise data are lacking, 90% of the more than 1,000 business schools in the country also appear to be privately run. The number of private, independently financed colleges offering general education is also expanding. For instance, in Uttar Pradesh, self-financing private institutions outnumber state-assisted colleges, while in Tamil Nadu, self-financing colleges comprise 56% of general colleges. Among these, 96% are engineering colleges. Educational institutions, including private universities and coaching centers, have emerged as the major source of advertising spending in print media, which in turn controls the biggest slice of India’s advertising market. Even as political parties oppose de jure privatization of education, de facto privatization continues unabated (Kapur 2007).

Whether public or private, India’s institutions of higher education increasingly respond to market forces by aligning their programs and courses with demand in the job market (Table 13).

Debate continues, however, over the value and possible costs of the growing privatization of higher education in India. Some experts argue that private colleges should be supported because they are better suited than public institutions to solving the country’s skilled labor shortage and matching the supply of skills they impart to the particular demands of specific industries. Others contend that private institutions put profit before quality and that their skills-driven courses may not help students in
Figure 3: Growth in Enrollment in Private and Public Education Institutions, Academic Years 2000–2001 and 2005–2006*

<table>
<thead>
<tr>
<th>Type of Institution</th>
<th>AY2001</th>
<th>AY2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>4,342</td>
<td>4,393</td>
</tr>
<tr>
<td>Private aided</td>
<td>3,134</td>
<td>5,760</td>
</tr>
<tr>
<td>Private unaided</td>
<td>3,223</td>
<td>7,720</td>
</tr>
</tbody>
</table>

AY = academic year.

* The figure is based on the data from the National Knowledge Commission report 2006.

Table 13: Growth and Share of Career-Oriented Courses and Programs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>669</td>
<td>1,478</td>
<td>121</td>
<td>88</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>204</td>
<td>639</td>
<td>208</td>
<td>94</td>
</tr>
<tr>
<td>Hotel management</td>
<td>41</td>
<td>70</td>
<td>70</td>
<td>90</td>
</tr>
<tr>
<td>Architecture</td>
<td>78</td>
<td>118</td>
<td>51</td>
<td>67</td>
</tr>
<tr>
<td>Teacher education</td>
<td>1,050</td>
<td>5,190</td>
<td>395</td>
<td>68</td>
</tr>
<tr>
<td>Medicine (allopathic)</td>
<td>780</td>
<td>976</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>MBA</td>
<td>682</td>
<td>1,052</td>
<td>55</td>
<td>64</td>
</tr>
<tr>
<td>Medicine (allopathic)</td>
<td>174</td>
<td>229</td>
<td>32</td>
<td>46</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>52</td>
<td>205</td>
<td>294</td>
<td>92</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,730</strong></td>
<td><strong>9,947</strong></td>
<td><strong>167</strong></td>
<td><strong>78</strong></td>
</tr>
</tbody>
</table>

AY = academic year, MBA = Master of Business Administration, MCA = Master of Computer Applications.
Source: Agarwal 2006.
the long run because demand for specialized skills will keep changing. If India adopts labor reforms, they say, students educated in narrowly defined, specific courses, which give insufficient exposure to general education may have difficulty adapting to changing labor market conditions.

**Key Points and Analytical Framework**

This section identifies some issues that India’s higher and professional education system has experienced or is facing and explores possible solutions. As PRC scholars, we try to compare the situation in India with that in the PRC with a view to identifying lessons for the PRC and other developing countries.

It is more difficult to evaluate the effectiveness of a country’s higher and professional education system than its economy, since the education system is interwoven with all aspects of society while the economy can be evaluated independently. In the following sections, we therefore focus our analysis on the relationship between India’s higher and professional education system and the country’s economic growth, touching on the successes and problems.

Great obstacles lie ahead for higher and professional education in India despite its successes over the last 6 decades. Critics argue that the system is deteriorating because of rapid expansion, shrinking resources, and the defects of the affiliation system (Kaul 2006). It has faced serious problems before: in 1985, the Ministry of Education described the higher education system as “warped.” The country’s experience in attempting to solve these problems can shed light on possible answers to similar issues faced by other developing countries.

**India’s Growing Economy and Large Human Resource Base**

Two aspects of India’s recent economic development have attracted global attention—its GDP growth rate which reached 9.7% in 2006, and its position as a world leader in IT. Indian call centers provide services for many multinational corporations, and the country is emerging as a global center for fields such as biotechnology, pharmaceuticals, and auto components. India also boasts a growing number of world-class enterprises. Infosys, for example, ranks among the world’s top 10 most innovative companies (Dutz 2007). India’s remarkable economic performance is largely the result of major reforms begun in 1991 that opened up its economy and provided the incentives that led to its prosperity.

India’s rapid growth is closely correlated with its human resource supply, which in turn is a product of a strong system of higher and professional education. India has the world’s third-largest higher education system after the US and the PRC (Jayaram 2004). Consequently, it has the world’s third-largest pool of science and technology personnel, numbering 8 million–10 million, and it can export skilled information, communication, and technology workers (Tilak 2007). India also enjoys a sound reputation in technological and management education. The IITs and the IIMs are regarded as world-class institutions in terms of the quality and employability of their graduates. India is also an overachiever in research and development, accounting for 8% of all
funding for these purposes in the developing countries and ranking first in the number of articles published (Altbach 1998).

Any analysis of higher education in India should take into account the main characteristics of Indian society. India has a huge population of more than 1.1 billion. Its GDP per capita based on purchasing power parity was $3,452 in 2005, placing it 127th out of 177 countries, and it was ranked 128th on the United Nations Development Programme's Human Development Index (UNDP 2008). India is a country in which both traditional and modern economic and social elements coexist. Agriculture accounts for a large proportion of employment, and much of the population is rural. As much as 35% of the population lives below the poverty line.8

Similar to society as a whole, India's education system and human resources also feature large inequities. In 2007, about 45% of women over the age of 15 were illiterate, while almost 25% of similarly aged men were illiterate (World Development Indicators 2007). Yet the country is also a huge repository of world-class scientific, engineering, and technical talent.

In short, India is a large country gripped by vast disparities. Its tremendous social and economic problems and contrasts have deep historical roots and must be solved before it can fully modernize. Its successes, however, still point the way to a bright future and provide lessons for other developing countries. This is especially true in the field of higher and professional education, where India’s experience can show how a developing country can create an elite education system and thereby spur its economic growth despite the hindrance of widespread poverty.

The two largest countries in the world by population—India and the PRC—illustrate different models of economic development. India’s growth has centered on services, while the PRC’s has focused on the manufacturing industry. Table 14 compares the two countries’ indicators of social and economic development. India’s service sector is substantially larger in proportion to GDP than that of the PRC, and the country’s services-oriented mode of economic development is less dependent on natural resources than industry-led growth and has a lower environmental impact. This makes it worthy of study and perhaps emulation by other developing countries.

India’s successful higher education strategy has even had an impact on the US. Although only 1.7 million of the total US population of 300 million is of Indian descent, one-third of the engineers in California’s high-tech Silicon Valley are Indians, and 40% of the companies there were founded by Indian entrepreneurs. One in 14 chief executive officers of firms in the area is Indian (Smith 2007).

As India’s economy has grown, Indian governments have increased their investment in education at all levels. Investment in education in proportion to GDP is relatively higher in India than in the PRC. Funding for higher education in India (18%) and the PRC (21%) is comparable with international levels of 15%-20% (Table 15). The proportion tends to be lower in advanced countries (Salmi and Hauptman 2006), and developing countries generally use more of their funds to prioritize technical and professional education (Psacharopoulos 1980). This emphasis on higher education

---

8 In 2004, the poverty incidence was 27.5% based on national poverty lines, and 35.1% based on $1 purchasing power parity a day. Source: Asian Development Bank 2008.
Table 14: Contrast in the Level of Social Development between India and the People’s Republic of China

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total population (billion)</td>
<td>1.0</td>
<td>1.1</td>
<td>1.1</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Annual population growth rate (%)</td>
<td>1.7</td>
<td>1.4</td>
<td>1.3</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Life expectancy at birth (years)</td>
<td>62.4</td>
<td>64.0</td>
<td>64.8</td>
<td>71.4</td>
<td>72.6</td>
<td>73.0</td>
</tr>
<tr>
<td>Fertility rate (births per woman)</td>
<td>3.3</td>
<td>2.7</td>
<td>2.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Infant mortality (per 1,000 live births)</td>
<td>68.0</td>
<td>57.7</td>
<td>54.3</td>
<td>30.0</td>
<td>21.4</td>
<td>18.7</td>
</tr>
<tr>
<td>Gross enrollment rate in primary school (%)</td>
<td>93.89</td>
<td>111.7</td>
<td>111.9(^a)</td>
<td>–</td>
<td>111.2(^a)</td>
<td>112.3</td>
</tr>
<tr>
<td>Gross enrollment rate in secondary school (%)</td>
<td>46.3</td>
<td>54.0</td>
<td>54.6(^a)</td>
<td>62.9</td>
<td>75.5(^a)</td>
<td>77.3</td>
</tr>
<tr>
<td>Gross enrollment rate for tertiary education (%)</td>
<td>9.6</td>
<td>11.0</td>
<td>11.9(^a)</td>
<td>7.7</td>
<td>21.6(^a)</td>
<td>22.9</td>
</tr>
<tr>
<td><strong>Economy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP growth rate (%)</td>
<td>4.0</td>
<td>9.4</td>
<td>9.1</td>
<td>8.4</td>
<td>10.4</td>
<td>13.0</td>
</tr>
<tr>
<td>Ratio of agriculture in GDP (%)</td>
<td>23.4</td>
<td>18.2</td>
<td>18.1</td>
<td>15.1</td>
<td>12.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Ratio of industry in GDP (%)</td>
<td>26.2</td>
<td>28.8</td>
<td>29.5</td>
<td>45.9</td>
<td>47.7</td>
<td>48.5</td>
</tr>
<tr>
<td>Ratio of services in GDP (%)</td>
<td>50.5</td>
<td>52.2</td>
<td>52.3</td>
<td>39.3</td>
<td>40.0</td>
<td>40.4</td>
</tr>
<tr>
<td><strong>Government and Market</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time required to start business (days)</td>
<td>–</td>
<td>71.0</td>
<td>33.0</td>
<td>–</td>
<td>48.0</td>
<td>35.0</td>
</tr>
<tr>
<td>Ratio of export of high-tech to export of manufacturing (%)</td>
<td>5.0</td>
<td>4.9</td>
<td>5.3</td>
<td>18.6</td>
<td>30.6</td>
<td>29.7</td>
</tr>
</tbody>
</table>

\(- = \text{no data}, \text{GDP} = \text{gross domestic product}, \text{PRC} = \text{People's Republic of China.}\)

\(^a\) 2006 data.

Source: World Bank, various years.

was once believed to contravene social justice goals, and educational economists have suggested that the much larger part of public spending should be invested in basic education while higher education should depend on cost recovery measures (World Bank 1986; Psacharopoulos 1985; Psacharopoulos and Nguyen 1997).

Demographic and economic dissimilarities place the PRC, India, and the US at different levels of educational development: India’s higher education system is at the elite stage, the PRC’s is at the mass stage, and the US higher education system is at the universal access stage (Table 16).
Table 15: Distribution of Educational Expenditure in India and the People’s Republic of China (%)

<table>
<thead>
<tr>
<th>Item</th>
<th>India</th>
<th>PRC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public expenditure on education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>as % of GDP</td>
<td>3.2 (2005)</td>
<td>1.9 (1999)</td>
</tr>
<tr>
<td>as % of total government expenditure</td>
<td>10.7 (2003)</td>
<td>13.0 (1999)</td>
</tr>
<tr>
<td>Distribution of public expenditure per level (1999) (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-school</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Primary school</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>Middle school</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>College</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>Unknown</td>
<td>13</td>
<td>5</td>
</tr>
</tbody>
</table>

GDP = gross domestic product, PRC = People’s Republic of China.
Note: Percentages may not sum to 100 due to rounding.

Table 16: Education Data for the Three Countries with the World’s Largest Higher Education Enrollments, 2004

<table>
<thead>
<tr>
<th>Country</th>
<th>Enrollment ('000)</th>
<th>Teachers ('000)</th>
<th>Number of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General higher education</td>
<td>13,335</td>
<td>858</td>
<td>1,731</td>
</tr>
<tr>
<td>Adult higher education</td>
<td>4,198</td>
<td>86</td>
<td>505</td>
</tr>
<tr>
<td>India*</td>
<td>10,481</td>
<td>472</td>
<td>17,973</td>
</tr>
<tr>
<td>United States</td>
<td>17,100</td>
<td>1,175</td>
<td>4,197</td>
</tr>
</tbody>
</table>

PRC = People’s Republic of China.
\* Data for India is from 2005.
Sources: PRC: Statistical Bulletin for National Education Development 2004; India: University Grants Commission (universities include central, state, private, and deemed universities as also institutions of importance established both by the central and the state legislatures); United States: National Center for Education Statistics 2004.

Table 17 provides a comparison of higher education in India and the PRC. In terms of the number of institutions, student enrollment, the student–teacher ratio, and the speed of development, the figures for the PRC exceed those of India. With a gross enrollment rate of 20.3%, compared with India’s 11.4%, the PRC offers more of its citizens the opportunity to receive a higher education than is the case in India. Its gross enrollment has also grown faster: during 1995–2002, the annual enrollment growth rate in India was only half that of the PRC, which averaged 12.1%.

This raises the question of whether the speed of higher education growth can affect the quality of higher education. This is difficult to answer without objective data; however, research sources indicate that the quality of higher education has become an issue in both countries during the period of rapid expansion.
India’s system contrasts with that of the PRC in another important respect: enrollment at private higher education institutions is 30% in India, compared with 15% in the PRC. Differences in the share of private higher education reflect contrasts in finance and expenditure in their higher education systems (Table 17).

India’s proportion of educational expenditure to GDP (3.2% in 2005) (Table 15) is higher than that of the PRC (1.9% in 1999) while the PRC’s proportion of education expenditure in public spending (13% in 1999) is higher than that of India (10.7% in 2003). Both countries have tended to invest more in higher education as a proportion of overall education spending than the average for developing countries.

### Table 17: Selected Indicators for Higher Education in India and the People’s Republic of China

<table>
<thead>
<tr>
<th>Indicators</th>
<th>India</th>
<th>PRC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Institution and Enrollment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student–faculty ratio</td>
<td>22&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Combined primary, secondary, and tertiary gross enrollment ratio (%)</td>
<td>63.8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>69.1&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Average annual growth rates in tertiary, enrollment (1995–2002) (%)</td>
<td>6.1</td>
<td>12.1</td>
</tr>
<tr>
<td>% enrollment in private sector</td>
<td>30&lt;sup&gt;b&lt;/sup&gt;</td>
<td>15&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Finance and Expenditure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tertiary education expenditure as a share of total education expenditure (%)</td>
<td>18&lt;sup&gt;c&lt;/sup&gt;</td>
<td>21&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>% of tertiary education expenditure to GDP</td>
<td>0.8&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.8&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Relative proportions of public and private expenditure on tertiary education institutions</td>
<td>99.7/0.3&lt;sup&gt;d&lt;/sup&gt;</td>
<td>56.8/43.2&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Relative proportions of direct public expenditure on public institutions and private institutions (tertiary)</td>
<td>78.2&lt;sup&gt;d&lt;/sup&gt;</td>
<td>93.7&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Relative proportions of direct public expenditure on indirect transfers (tertiary)</td>
<td>21.5&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Relative proportions of direct public expenditure on payment to the private sector (tertiary)</td>
<td>0.3&lt;sup&gt;d&lt;/sup&gt;</td>
<td>6.3&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Current expenditure as % of total (tertiary)</td>
<td>96.9&lt;sup&gt;d&lt;/sup&gt;</td>
<td>77.6&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Capital expenditure as % of total (tertiary)</td>
<td>3.1&lt;sup&gt;d&lt;/sup&gt;</td>
<td>22.4&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Staff compensation as % of current expenditure (tertiary)</td>
<td>99.6&lt;sup&gt;d&lt;/sup&gt;</td>
<td>46.0&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Non-staff expenditure as % of current expenditure (tertiary)</td>
<td>0.4&lt;sup&gt;d&lt;/sup&gt;</td>
<td>54.0&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
</tbody>
</table>


<sup>a</sup> = 2004 data, <sup>b</sup> = 2005 data, <sup>c</sup> = 2003 data, <sup>d</sup> = 1999 data.

In 2003, 99.7% of India's higher education spending came from public expenditure, compared with only 56.8% in the PRC, where private investment amounted to 43.2%. Although India's system relies more on private delivery than that of the PRC, it has largely adopted public financing. The PRC, meanwhile, relies more on public delivery while adopting private cost recovery to a much greater extent than India. Almost 22% of direct and indirect public spending on higher education in India goes to private institutions, while a little over 6% of the PRC's spending goes to private colleges. In short, India has employed much more public finance to build its private higher education system than the PRC, which has relied to a greater extent on tuition paid by students.

Significant differences also exist between India and the PRC in the use of funds. In 1999, spending on higher education in India went mainly to recurrent expenses (96.9%), with a small proportion allocated for capital construction. In the PRC, recurrent expenses accounted for 77.6% and capital construction for 22.4% in the same year. Recurrent expenses in India were overwhelmingly for personnel (99.6%), while non-personnel expenses accounted for a favorable 54.0% of recurrent outlay in the PRC (Table 17).

A final key difference between the two countries comes as a revelation to us and shows that the PRC can learn from the way India has built and developed its higher and professional education system: in terms of employment generated and the economic yield of their system, India's indicators are sometimes better than the PRC's. This shows that India's higher education is better matched to the needs of the country's economy, a fact that is borne out by the growth it has experienced. The PRC should pay attention to matching the development of higher education to the needs of its economy. The Indian higher education system’s institutional autonomy, legal and regulatory framework, and scale of involvement in the international academic community also provide lessons from which the PRC can learn.

An Economic Model for Higher Education

An analytical framework is necessary to evaluate the relevance and appropriateness of India's higher and professional education explicitly or implicitly. From an economic viewpoint, supply and demand is the primary relationship in the development of higher education; therefore, an analytical economic model can be used to analyze the existing problems and solutions in Indian higher education. Figure 4 shows two markets that work under assumptions of competition, information, and human economic rationality. Universities and colleges have to handle demands from two sides: on the one hand, the higher and professional education system as a whole responds to labor market demand through information such as labor price; on the other hand, the labor market can influence higher and professional education and adjust student demand and choice. No market can work perfectly, and as a quasi-public good higher and professional education is a typical imperfect market. The “invisible hand” will not work well without incentives for education in pure science, humanities, and the arts, which the market does not favor, and for the underprivileged population that cannot afford expensive education. Government interference through public spending and regulation—the so-called visible hand—is necessary when the market does not work well.
On the basis of the above model, we can make some theoretical deductions or empirical analyses based on evidence regarding India’s higher and professional education. The major characteristics or problems summarized below are applicable to many developing markets and specifically to India.

Firstly, public higher and professional education is an over-demanded good in unsustainable market. In a hierarchical society with an underdeveloped economy, India’s higher and professional education is an important way for people to achieve social mobility. This led to over-demand and short supply of higher and professional education, particularly because the system is highly subsidized with public money, i.e., the people’s demand for higher and professional education exceeded that demanded by economic development. Consequently, over-education and underemployment arose, and higher and professional education grew beyond the state’s economic ability to sustain it. This problem arose principally because the need for higher education often arises regardless of labor market demand.

Secondly, a structural imbalance occurred between general higher education and professional higher education. In 2006, 46% of students majored in the arts, 20% in science, 18% in business and management, 7% in engineering, 3% in medicine and
law, and 1% in agriculture (Dutz 2007). The current structure of education favors general higher education rather than professional or practical education. Some scholars argue that the existing structure is distorted and propose a shift in emphasis toward practical programs. Other scholars believe that the benefits of a general education outweigh those of technical or practical programs because general education arguably provides students with skills and abilities that are transferable and sustainable in a dynamic economy.

Thirdly, India has lacked effective quality assurance mechanisms and corresponding incentives to improve quality. Higher and professional education grew faster than the available resources, leading to a deterioration of facilities and infrastructure and a shortage of suitably qualified faculty.

Fourthly, because higher and professional education is a quasi-public good, there is a certain amount of government intervention, although its degree and nature varies from country to country. In India’s case, higher and professional education was treated as a public utility. Over-control by the government led to problems such as rigidity and under-funding. In recent years, the government relaxed its control and allowed the market to play a greater role. The increased participation of private higher education institutions enables the education system to respond effectively and quickly to labor market demand without imposing an additional public burden. However, in a dual system with public and private sectors, new problems emerge for which public–private partnerships are seen as a solution.

A Common Dilemma in the Development of Higher and Professional Education

In the era of globalization and the knowledge economy, India faces new opportunities for development and prosperity. To seize these opportunities, India needs to have sufficient educated and senior professionals. In 2006, there were 355 universities and about 18,064 affiliated colleges in India with 10 million students enrolled and over 500,000 faculty members, and the enrollment rate in higher education was 11.4%. The country is following the international trend in education by upgrading its higher and professional education from an elite system to a system that provides wider access. In the process, India could face a number of dilemmas that confront any country as it transitions from elite to mass higher education (Trow 1973):

(i) A contradiction between scale and employment. As the system expands and opportunities increase for student enrollment, educational resources can translate into human resources and promote economic development only if college graduates can be properly employed. If the labor market does not have enough places, a country risks high levels of graduate unemployment that could trigger social instability. Developing countries like India, with their comparatively weak economic foundations, must regard the expansion of employment opportunities as equal in importance to the expansion of higher education.

(ii) A contradiction between quantity and quality. At India’s current elite stage of higher education development, quality is not an obvious problem because incoming students are well prepared and the student profile is homogeneous. Once India enters the mass higher education stage, larger numbers of less
Higher and Professional Education in India

well-prepared students will contribute to an increasingly heterogeneous student body, and the issue of quality will become more prominent. Quality problems will result from an undersupply of qualified faculty, high teacher–student ratios, inadequate teacher–student interaction, outdated teaching materials, obsolete teaching methods, under-stocked libraries, and run-down and out-of-date equipment and facilities.

(iii) **A contradiction between academic and professional education.** The balance between academic education and professional or vocational education is always an issue in the transition from elite to mass education. At the elite stage, courses are mainly academic. At the mass higher education stage, most students engage in non-academic work, not only from personal choice but also due to their poorer academic preparation. Only a minority still views academic-oriented education as appropriate or desirable. As the education system evolves, the function and character of the institutions change, and the question of how to effectively integrate these two categories of program becomes an issue that all countries must address.

(iv) **A contradiction in the nature of education and economic activity.** By its nature, higher and professional education is characterized by stability and a long life cycle. Economic activities, by contrast, are characterized by a short life cycle and rapid change, particularly in this era of technological progress and the emergence of the knowledge economy. Higher and professional education faces unprecedented challenges as it tries to accommodate this economic dynamism. It must become dynamic itself and, at the same time, pay more attention than ever before to the crucial issues of environmental protection, energy consumption, and ecological balance, which could affect human survival. As a result, higher and professional education has to respond with the often contradictory demands of a dynamic and sustainable economy.

(v) **A contradiction between public and private.** Limited public resources and the defects inherent in the public system make private provision of higher and professional education necessary. Private provision takes various forms: the most basic involves the private sector in resolving funding shortages through tuition fees, donations, and raising funds on the capital market; whereas more direct participation sees the establishment of private colleges and private ownership of public colleges. In managing the relationship between public and private contributions to education, the limitations of both government and market mechanisms in education should be closely watched so that they are employed wisely to achieve goals of efficiency, quality, equity, and choice.

**Major Problems to Solve**

India’s higher and professional education system has three key problems that need to be overcome to better support the country’s economic development.

Firstly, India is short of the professional and technological workforce it needs to sustain its current rapid pace of economic growth. The current education system
cannot meet the requirements created by its world-class IT industry and a growth pattern that is now dominated by exports based on professional and technological services. The country may have one of the world’s largest cadres of science and technology expertise in terms of absolute numbers but, relative to population size, it is falling behind. There were only 7 scientists and engineers for every 1,000 people in 1999, which is between one-tenth and one-thirtieth of the numbers of many other countries (Tilak 2007).

How serious is the problem? According to the 2005 NASSCOM–McKinsey report, India will require 2.3 million IT and business process outsourcing professionals by 2010 and is likely to face a shortfall of about 0.5 million (Dutz 2007). In October 2006, the New York Times reported that India was only half way toward attaining the enrollment rate it needs in professional and technological personnel training to sustain its rapid economic development (Tilak 2007).

The second challenge is that the existing structure of India’s higher and professional education system does not match the needs of its economy. In 2006, about 65% of students majored in arts and humanities and about 28% of students majored in technology, engineering, and science (Table 9). The current shortage in human capital and professional labor is only one result of this mismatch; it coexists with the oversupply and unemployment of academically educated Indians (Shukla 1991).

India’s decision to pursue a quantitative expansion of its higher and professional education system has been achieved at the expense of quality, and has created the third central problem it must now resolve (Altbach 1998). Quality has become a big concern in India’s higher education (Tilak 2007). The speed of the system’s expansion in the past few decades has outpaced the rate of increase in funding and the supply of qualified faculty (Altbach 1998). The shortage of good faculty, in particular, can have a devastating effect on the quality of education delivered and of the graduates it produces (Tilak 2007). To illustrate the severity of this problem, a survey of business personnel managers in India found that only one in four engineering graduates has the necessary skills to obtain employment without further training (Dutz 2007).

India’s Successful Experiences

India has made great efforts to solve the problems facing its higher education system. Its successful experiences need to be studied and shared internationally.

A System’s Differentiation Meets a Society’s Diverse Needs

International experience in higher and professional education shows that, with expansion of scale and multiplication of function, systematic differentiation may help meet the diverse needs of society (Kerr 1994). In India, the higher and professional education system is large and complex, and public and private systems, formal and non-formal, university and non-university, and academic and professional systems coexist in the country. This differentiated structure is assumed to respond more effectively to diverse social needs.

The affiliating structure of India’s higher education, based on the federal system of the University of London, is advantageous in achieving a dramatic expansion of
colleges while allowing a limited number of universities to maintain similar standards across the system.

General and professional education coexist in India’s higher and professional education system in a ratio of about four students to one (Table 18). This binary system can meet the needs of economic development better than a single system, but it is not in balance with current economic needs. India has, however, made efforts to enlarge its professional education component, particularly since 1980. Many training centers have been established, and the newly emerging private institutions focus on practical skills.

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Enrollment</th>
<th>Outturn</th>
<th>Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number ('000)</td>
<td>Number ('000)</td>
<td>Number ('000)</td>
</tr>
<tr>
<td>General stream</td>
<td>8,556</td>
<td>2,095</td>
<td>40,490</td>
</tr>
<tr>
<td>Professional stream</td>
<td>1,744</td>
<td>559</td>
<td>10,650</td>
</tr>
<tr>
<td>Total</td>
<td>10,300</td>
<td>2,654</td>
<td>51,140</td>
</tr>
</tbody>
</table>

Source: Agarwal 2007a.

### Developing High-Quality Professional Education to Satisfy the Economic Needs of the High Technology Sector

Many countries have found it difficult to maintain the quality of education during periods of expanding enrollment. In India, despite the quality problems that rapid expansion has produced overall, the country has successfully developed and maintained high standards in its elite higher and professional education institutions.

At independence, India set ambitious goals for its education system. The new government set up the Scientific Manpower Committee in 1947, headed by S.S. Bhatnagar, to review the country’s needs for scientific and technical expertise. Based on the committee’s recommendations, the government established several professional institutions, notably the IITs, which were modeled on the renowned Massachusetts Institute of Technology in the US (Mehendiratta 1984). The seven IITs were established from the 1950s onward with the assistance of the United Kingdom, Germany, the former Soviet Union, and the US (Table 19). These efforts were later replicated.

In addition to the IITs, India also has six campuses of the highly regarded Indian Institute of Management (IIM) (Tilak 2007). These are classified as Institutions of National Importance and were created outside the existing university system with the aim of achieving excellence. They have more autonomy than existing universities to attract the best faculty and select students from the top tier of candidates. The IIMs built excellent reputations within a few years of their establishment. Consequently, they get sound returns from the labor market, and their graduates have earned good positions and high incomes in domestic and international enterprises.
Table 19: Profiles of the Seven Indian Institutes of Technology

<table>
<thead>
<tr>
<th>Location of IITs</th>
<th>Year of Establishment</th>
<th>Students</th>
<th>Faculty and Staff</th>
<th>Source of International Assistance when Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi</td>
<td>1961</td>
<td>2,265</td>
<td>421</td>
<td>13 Britain</td>
</tr>
<tr>
<td>Mumbai</td>
<td>1958</td>
<td>–</td>
<td>–</td>
<td>14 UNESCO and former Soviet Union</td>
</tr>
<tr>
<td>Kharagpur</td>
<td>1950</td>
<td>2,700</td>
<td>450</td>
<td>18 European countries</td>
</tr>
<tr>
<td>Chennai</td>
<td>1959</td>
<td>4,500</td>
<td>460</td>
<td>15 Germany</td>
</tr>
<tr>
<td>Roorkee</td>
<td>2001</td>
<td>4,200</td>
<td>628</td>
<td>18 –</td>
</tr>
<tr>
<td>Guwahati</td>
<td>1994</td>
<td>–</td>
<td>–</td>
<td>11 –</td>
</tr>
</tbody>
</table>


* = Total of students under the master and doctor programs in Kanpur.

Sources: Websites of the seven Indian Institutes of Technology.

How did the IITs attain international levels of excellence in such a short time? The literature and interviews suggest that a number of factors were responsible:

- They aimed to reach world standards in professional and technology education from the outset.
- They recruited the best faculty, including many who had been educated abroad, and accepted only the top 3%–4% of student applicants.
- They have a low total enrollment which does not exceed 4,500 students in each institution.
- They are well funded, have a low student–faculty ratio, and employ a large support staff.
- Their institutional autonomy is secured, they set their own high standards, and have their own rigorous examination system.
- They have strong international link, which have played a crucial role in raising the IITs to a world standard.

Guaranteeing Autonomy, Increasing Flexibility, and Emphasizing Generic Skills

A higher and professional education system must be flexible and adaptable so it can adjust easily to its external environment in an age of rapid scientific, technological, and economic change. Today, expanding institutional autonomy is considered an effective way to resolve problems such as rigidity, low efficiency, and under-funding.
India’s higher and professional education system inherited institutional autonomy from the British colonial university system. This autonomy was consolidated after the Independence. In 1964, the Kothari Commission emphasized university autonomy in the selection of students, the appointment and promotion of teachers, the selection of research fields, and the determination of courses of study, methods of teaching, and areas of study (Mehendiratta 1984). This institutional autonomy has generally limited government involvement, although there have been instances of dilution in recent years in some provinces.

India’s universities have a flexible schooling system, with the length of time needed to achieve different degrees varying from 3 to 7 years, depending on the field of study. College students also have some freedom in selecting courses, which enables them to pursue varied interests and still meet academic requirements. They can combine and integrate general knowledge and professional knowledge in their education, avoiding excessive concentration. Some universities integrate a vocational component into their academic curricula. After graduation, students can choose to move on to advanced education, or to join the job market.

Centers of relevance and excellence were established within the university network to strengthen the linkages between the university and the industrial community and to train outstanding graduates for industrial development (Dutz 2007). The government encourages universities to strengthen ties with industry through communication, internships, and joint committees to design curricula. These efforts will make higher education more relevant to the country’s economic goals.

Educating students for immediate employment, while also laying a solid foundation for their long-term development, is a challenge for all higher and professional education institutions. In India, the fostering flexibility, adaptability, and skills needed for lifelong learning are seen as ideal tools for this task.

Self-employment is a major part of India’s economy where 90% of the workforce is in the informal sector. The government and higher education institutions are promoting education in entrepreneurship. Entrepreneurship education can have the long-term effects of reducing unemployment and generating economic development.

**Initiatives in the Private Sector**

The growing role of private higher and professional education has played a big part in the growth of India’s IT sector, exports, and overall economy. Private universities are rare, but private colleges are common. About 66%–75% of all colleges are now private and they account for 30% of total enrollment. Over half of private colleges and universities receive financial support from the government (Tilak 1999). With their emphasis on professional education, these institutions are job-oriented. Private colleges and institutions account for the 80% of institutions and students in professional higher education. More than half the polytechnics are private, and these institutions now play an important role in providing skilled workers for the IT industry.

Other private institutions include community colleges, which are mainly established by nongovernment organizations. They receive recurrent expenditure and development funding from the government and UGC, and have some autonomy to innovate in pursuit of excellence.
Public Policy

Public policy plays an important role in the development of higher education. In 1986, India’s Parliament passed the National Policy on Education which stated:

Higher education provides people with an opportunity to reflect on the critical social, economic, cultural, moral and spiritual issues facing humanity. It contributes to national development through dissemination of specialized knowledge and skills. It is therefore a crucial factor for survival. Being at the apex of the educational pyramid, it has also a key role in producing teachers for the education system. In the context of the unprecedented explosion of knowledge, higher education has to become dynamic as never before, constantly entering uncharted areas (Ministry of Human Resource Development 1986).

India has emphasized industrialization and modernization in its 5-year plans. These plans have increased the demands on higher and professional education each year. Human resources became a special concern beginning with the Sixth Five Year Plan (Behar 1992). The Eleventh Five Year Plan (2007–2012) aims to achieve a gross enrollment ratio in higher education of 15% (Tilak 2007).

In the 1950s and 1960s, the rate of expansion of higher education was about 13%–14%. In the 1980s, this was reduced to 4%–5% due to concerns about unemployment and erosion of quality. Recently, UGC began to place greater emphasis on quality and excellence in higher education. It has launched programs to identify and support universities with potential, identify one specific area of specialization in each university, and support excellence in colleges (Tilak 2007).

The government has influenced the quality of higher education in other ways, including the establishment of NAAC, the National Board of Accreditation, and the Accreditation Board. It also introduced a policy on globalization for higher education in the early 1990s, which aimed to raise standards (Tilak 2007).

Higher and Professional Education Plays an Unprecedented Role in the Global and Knowledge Economies

Before the 1980s, India’s higher education system had only loose ties to economic development (Tilak 1999). In fact, the rapid growth of higher education in 1950s and 1960s brought unemployment and a brain drain—economic problems that were unexpected and unwelcome (McMahon 2002). In more recent decades, however, higher education engaged with and served India’s economy in many ways. In particular, the highly skilled workforce created has made significant contributions to India’s service industry since the 1980s (Amin and Mattoo 2008), and supports the country’s increasingly important role in the global and knowledge economies.

The economic rate of return arguably underestimates the contribution of higher education (Birdsall 1996; Psacharopoulos and Patrinos 2002), so we need to review the contribution of higher education, especially to global and knowledge economies which favor creativity and innovation. The brain drain, for example, was once viewed as an economic loss to the country. However, Indians who emigrated for employment in the new world economy have contributed to their country’s growth in unforeseen ways, including the development of IT expertise, industries, trade, and markets for services.
Summary

In recent years India’s economy has grown remarkably and caught the world’s attention. It has become a world center for the IT industry and IT services. This economic success is mainly due to its investment in education, especially higher and professional education. Despite economic hindrances, India built world-class technical institutes of higher learning. This experience needs to be shared internationally, especially with other developing countries.

In an age of economic globalization, India plans to boost its economic strength by capitalizing on the comparative advantages of its labor force and growing domestic market. The government plans to transform its large population into valuable human capital. This can only be achieved through continued investment in quality education in general, and in higher and professional education in particular. Indeed, this investment is also necessary to sustain India’s current level of growth.
Reference


World Bank. 1986. *Financing Education in Developing Countries: An Exploration of Policy Options*. Washington, DC.
India’s Financial Sector Reform and Experience: Lessons for the People’s Republic of China

Peter G. Zhang and Jian Yang

In the last 2 decades, India and the People’s Republic of China (PRC) have emerged as the two most dynamic economic powers in Asia, leveraging a deep influence on the global economy. Since the 1980s and 1990s when the PRC and India initiated economic reforms that reoriented their markets toward the rest of the world, they have achieved unprecedented success in alleviating poverty (World Bank 2005). Both have witnessed tremendous growth in their respective areas of comparative advantage (i.e., manufacturing in the PRC and services in India). Although the PRC has had a higher growth rate for a longer period than India (in terms of per capita gross domestic product [GDP] growth), India has also achieved certain outstanding results in its financial and services sectors, which should be studied by the PRC and other developing countries. Thus, this chapter describes India’s financial sector reforms and provides associated policy suggestions for the PRC and other developing countries.

1 Peter G. Zhang is the deputy director general of the Shanghai Bureau of the China Banking Regulatory Commission. Before this, he worked with leading investment banks in Asia and the Americas. He can be contacted at zhangguangping@cbrl.gov.com.cn. Jian Yang is the director of the Financial Information Center at the Renmin University of China. He is also a member of the International Advisory Board, Journal of Operational Research Society. He can be contacted at dongfang@public.bta.net.cn. The authors would like to thank the Asian Development Bank (ADB) for sponsoring this research project on the development experience of Asia’s two giants, the PRC and India. They wish to thank their Indian counterpart, the Indian Council for Research on International Economic Relations (ICRIER) in Delhi for arranging interviews in Delhi and Mumbai during their two trips to India. They also wish to thank officials and research personnel at the Bombay Stock Exchange, National Stock Exchange, and Reserve Bank of India for their cooperation, knowledge, and information. In Delhi, the authors greatly benefited from meeting with Ministry of Finance officials and the economic advisor to the Prime Minister. Special thanks to V. B. Tulasidhar of ADB, Amitendu Palit, and the entire ICRIER team. In the PRC, they are indebted to Dashu Wang, Ning Sao, and Meng Xiaohong for contributing to this project.

2 More than 300 million people in the PRC and 100 million people in India have overcome the vicious chain of poverty. See World Bank (2005).
An Overview of the Financial Sector Architecture

Background

After gaining its independence from the United Kingdom in 1947, India continued the colonial legacy of British India’s financial institutions, inheriting a complete legal and institutional infrastructure. This included Asia’s earliest functioning stock market (established in Bombay [now Mumbai] in 1875), a central banking system (created in 1935), many private banks, and a complete set of fiscal mechanisms. India adopted a mixed-economy model, in which the state controlled each stage of economic organization, including overall planning, production, and distribution. The private sector, which had already grown into a significant share of India’s economy, was allowed to exist side-by-side with the public sector, but with severe constraints. Thus, it could play only a complementary role in the economy, with state enterprises playing the leading role and attempting to monopolize most economic sectors.3

In the late 1980s and early 1990s, the government embraced economic reforms and initiated efforts to move toward a more market-oriented economic system. Attempts were made in the late 1980s to liberalize the financial sector and develop financial markets, but comprehensive reform measures were taken only after 1991. Financial sector reform has since been an integral part of economic reform, as its main objective was to open the economy to foreign investment and improve the financial sector’s efficiency in mobilization and intermediation of resources. During this period, each reform policy was preceded by some reform in financial policy. The financial reform program included wide-ranging reforms in the banking system and capital markets relatively early in the process, with reforms in insurance introduced at a later stage.4

Balance-of-Payments Crisis and Impetus for Reform

The economic reform process that began in 1991 took place amid two acute crises involving the financial sector. The first was the balance-of-payments (BOP) crisis that threatened the country’s international credibility and pushed it to the brink of default.5 The second was the grave threat of insolvency that was confronting the banking system, which had been concealed for years due to defective accounting policies (Lahiri 2005; Mohan 2006 and 2007; Reddy 2007).

In the early 1990s, many chronic problems in India’s economy could be linked to those of the financial sector. The government’s large-scale preemption of resources

---

3 To finance state priorities, Prime Minister Indira Gandhi carried out the nationalization of 14 banks in 1969 and 6 banks in April 1980. As a result of the nationalization, almost 90% of the banking assets were owned by the state, with the remaining 10% owned by private and foreign banks.

4 The capital market includes stock markets, mutual funds, pension funds, debt securities, and derivatives markets.

5 India was hard hit by the 1990 Gulf crisis, as many Indians working in the Persian Gulf region had to be airlifted out, halting foreign remittances, which were a major source of accumulating foreign reserves. Inflation hit 12.1% around 1990. The foreign currency assets of the Reserve Bank of India (RBI) decreased to only $975 million on 12 July 1991, sufficient only to pay for an import bill of less than 1 month (Lahiri 2006).
from the banking system to finance its fiscal deficit was another issue. Excessive microregulation that inhibited financial innovation and increased transaction costs, coupled with relatively inadequate levels of prudential regulation, led to poorly developed debt and money markets as well as outdated technological and institutional structures, which made the capital markets and the rest of the financial system highly inefficient (Lahiri 2005).

Before the BOP crisis, the financial sector had been largely serving the government, then the dominant player in economic development. Thus, the sector was underdeveloped, and the availability of instruments was limited. The sociopolitical considerations resulted in providing credit to priority sectors (e.g., small and medium-sized enterprises [SMEs]) at below-cost rates, creating a situation in which other sectors were charged higher rates of interest. The regulations of lending rates infringed on deposit rates, so the spread between the cost of funds and return on funds was maintained.

To deal with the crises, the government introduced radical reforms to achieve macroeconomic stability, the immediate responses being demand compression and fiscal correction. The 1991/92 Economic Survey (of India) (Central Statistical Organisation [CSO] 1992) noted that

[a] key element in the stabilization effort was the effort to restore fiscal discipline. Both the balance of payments problems which were building up over the past few years and the persistent inflationary pressure were the result of large budgetary fiscal deficits which characterized the economy year after year (part I, p. 355).

Thus, India sought an SDR2.2 billion standby arrangement from the International Monetary Fund (IMF).6 As per IMF conditions, India adjusted its fiscal policy under the arrangement.

Financial sector reform in India has had two phases. The road map for the first phase was laid down by the Narasimham Committee I Report of 1991.7 This phase involved the liberalization of interest rates and directed credit in the early 1990s. It focused on shifting away from treating the financial system as an arm of public finance and toward regulation, supervision, incentives, and the development of neglected areas within the sector. In 1998, the committee created a road map for the second phase. This phase, which is currently underway, has focused on reducing fiscal pressures on the financial system; improving the banking system, overall regulatory framework for credit, risk management, and investor protection; developing capital markets, pensions, insurance, and long-term investment markets; forging and managing links with external capital markets; and improving financial services provisions for customer welfare.

---

6 Following the BOP crisis, ADB sanctioned $300 million as a loan, which was used by the government to increase the capital of selected public sector banks (ADB 1999).
7 In 1992, RBI set up the Committee for Banking Sector Reform chaired by M. Narasimham.
The financial sector reform can be classified into three distinct areas aimed at

(i) liberalizing the overall macroeconomic and regulatory environment within which financial sector institutions function,
(ii) strengthening the institutions and improving their efficiency and competitiveness, and
(iii) establishing and strengthening the regulatory framework and institutions for overseeing the financial system.

After India launched these reforms in 1991, its economy responded strongly. A foreign exchange crisis in 1991 had brought down the GDP growth rate to a mere 0.8% in 1991/92. The rebound thereafter was strong and, during the 5 years ending 1996/97, the GDP growth rate averaged 6.9%, the highest ever for a 5-year period. This was accompanied by a turnaround in macroeconomic balances. The external current account deficit improved from a high of 3.5% in 1991 to 1.2% in 1996/97, and the debt–service ratio declined from 32.4% to 23.0%. External debt as a percentage of GDP fell to 25.0% in 1996/97 from a high of 37.0% a few years earlier. Fiscal deficit declined from 8.6% in 1990/91 to 5.1% in 1996/97. Foreign exchange reserves improved dramatically, rising from merely $13.8 billion by the end of March 1994 to $222 billion by the end of 2007.

**Table 1: Major Events of India's Financial Reform**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>The exchange rate is pegged to a basket of currencies on a controlled, floating basis (previously pegged to the pound sterling).</td>
</tr>
<tr>
<td>1986</td>
<td>India's nationals and foreigners are allowed to transfer capital abroad up to Rs1 million.</td>
</tr>
<tr>
<td>1990</td>
<td>Over the counter exchange is launched, and the Bombay Stock Exchange is linked to the Frankfurt Stock Exchange. The government liberalizes foreign investment policy. The credit rating on India's debt downgraded from Baa3 to Ba2. The government increases direct taxes and imposes import restrictions to manage the debt.</td>
</tr>
<tr>
<td>1991</td>
<td>The International Monetary Fund approves loans amounting to $1.8 billion. The government launches a new liberalization program. The Indian rupee is devalued 20%. Foreign direct investment is significantly liberalized.</td>
</tr>
<tr>
<td>1992</td>
<td>Permission is granted for foreign institutional investors to make investments in all securities traded on the primary and secondary markets. A dual rate system is created. Restrictions on the use of foreign currency loans and credit lines are abolished. A stock market scandal occurs. Foreign portfolio investors are permitted to invest directly in listed Indian securities.</td>
</tr>
<tr>
<td>1994</td>
<td>The Indian rupee is fully convertible for current account transactions.</td>
</tr>
<tr>
<td>2000</td>
<td>The Bombay Stock Exchange–Sensex (Sensitive Index) reaches a peak on 14 February due to heavy buying by foreign funds. Standard &amp; Poor's downgrades its outlook on India's credit rating from positive to stable.</td>
</tr>
<tr>
<td>2001</td>
<td>The central bank cuts interest rates. Controls on equity markets are further reduced. Standard &amp; Poor's downgrades India's currency ratings and outlook. Interest rates are cut again, and Standard &amp; Poor's affirms sovereign credit ratings and a negative outlook for India.</td>
</tr>
<tr>
<td>2003</td>
<td>India formally moves from debtor to creditor in its relations with the International Monetary Fund.</td>
</tr>
</tbody>
</table>

Source: Authors.
This strong initial response happened without substantial liberalization of the trade regime and reduction in tariffs. In subsequent years, however, India has undergone extensive—but selective—liberalization (Lane and Schmukler 2006). Extensive reform in equity markets and the banking sector has resulted in a much more developed domestic equity market than banking sector or bond market (Lane and Schmukler 2006). Corporate governance has also improved, thus encouraging investment by domestic and foreign minority shareholders. Further, successful development of the equity market helps explain the shift in the external financing of listed firms from debt to equity (Lane and Schmukler 2006). Substantial capital controls do remain in place.

The Current Institutional Architecture

India has a two-tier structure of financial institutions. National financial institutions are composed of term-lending institutions, specialized institutions, and investment institutions, including insurance. State-level institutions comprise state financial institutions and state industrial development corporations providing project finance, equipment leasing, corporate loans, short-term loans, and bill-discounting facilities to corporations. The government holds majority shares in these financial institutions. Nonbanking financial institutions provide loans and hire–purchase finance, mostly for retail assets, and are regulated by the Reserve Bank of India (RBI).

India’s banking system is characterized by a large number of banks with mixed ownership. In 2007, India had 88 scheduled commercial banks—28 public sector banks (i.e., with the government holding a stake); 29 private sector banks (i.e., without a government stake, and they may be listed on stock exchanges); and 31 foreign banks. They have a combined network of over 53,000 branches and 17,000 ATMs. According to a 2005 Indian Credit Rating Agency (ICRA) report, public sector banks hold over 75.0% of total assets of the banking industry, with private and foreign banks holding 18.2% and 6.5%, respectively. Even though these public sector banks have access to capital markets, government policy is to ensure that its equity interest does not, as a result of public issues by banks, fall below 51%.

New private banks have grown spectacularly over the last decade or so. From a negligible proportion of lending in 1994, they now supply over 12% of total credit. A new private bank, ICICI Bank, is now the second-largest bank in India, and the range of financial services that are available has grown significantly. The government has also admitted that public sector banks have been consistently outperformed by private sector banks and that the banking sector has not offered good returns on capital. The return on assets of India’s banks stood at 0.70%, against 1.20% for Singapore, 1.36% for Malaysia, 1.42% for the Republic of Korea, and 1.60% for Brazil.

The Bombay Stock Exchange and National Stock Exchange are the premier stock exchanges. These exchanges constitute an organized market for securities issued by the central and state governments, public sector companies, and public limited companies. Under the process of demutualization, these stock exchanges have been converted into companies, in which brokers only hold minority shares. In addition to the Securities Exchange Board of India Act, the Securities Contracts (Regulation) Act of 1956 and the Companies Act of 1956 regulate the stock markets.

The Bombay Stock Exchange was established in 1875, earlier than the Tokyo Stock Exchange. India’s securities market is second only to the United States (US)
market in terms of size, and its infrastructure is well developed and equipped with the latest technology for online trading. The National Stock Exchange is the third-largest exchange in the world, following only the New York Stock Exchange and NASDAQ in the number of transactions. India has the largest electronic-order book; the New York Stock Exchange and NASDAQ books are quote-driven. In the matter of single-stock futures, India leads the world, followed by Euronext, which is less than 25% of its size. Even in index futures, National Stock Exchange volumes are next only to the CME Group, Inc. and Eurex. No other market in the world, including that of Japan, compares with the volume of transactions of India’s markets.

**Regulatory Mechanism**

India has a financial system that is regulated by independent regulators in banking, insurance, and capital markets. In several other sectors, the government plays the role of regulator. India is a democratic republic with a federal form of government in which the Cabinet, led by the Prime Minister, is at the core of the system. Major economic decisions are made in the meetings of the Cabinet Committee on Economic Affairs, which are presided over by the Prime Minister and attended by cabinet ministers, including the finance minister. The Prime Minister is also the chairperson of the Planning Commission, which is responsible for creating 5-year and other annual plans. The Ministry of Finance, along with RBI, is responsible for policy formulation and the regulation of the financial market. The Securities and Exchange Board of

<table>
<thead>
<tr>
<th>Bank Category</th>
<th>Number of Banks</th>
<th>Assets (Rs billion and $ billion)</th>
<th>% of Total Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector banks</td>
<td>27</td>
<td>Rs14,714 ($334)</td>
<td>74.5</td>
</tr>
<tr>
<td>State Bank of India and associates</td>
<td>8</td>
<td>Rs5,493 ($124)</td>
<td>27.8</td>
</tr>
<tr>
<td>Nationalized</td>
<td>19</td>
<td>Rs9,222 ($210)</td>
<td>46.7</td>
</tr>
<tr>
<td>Private sector banks</td>
<td>30</td>
<td>Rs3,673 ($83)</td>
<td>18.6</td>
</tr>
<tr>
<td>Old private sector</td>
<td>20</td>
<td>Rs1,207 ($27)</td>
<td>6.1</td>
</tr>
<tr>
<td>New private sector</td>
<td>10</td>
<td>Rs2,466 ($56)</td>
<td>12.5</td>
</tr>
<tr>
<td>Foreign banks</td>
<td>33</td>
<td>Rs1,363 ($31)</td>
<td>6.9</td>
</tr>
<tr>
<td>All scheduled commercial banks</td>
<td>90</td>
<td>Rs19,750 ($448)</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Rs = rupees.
Sources: Indian Credit Rating Agency 2005; Cygnus 2004.

---

8 The ministry presents its major policy in the form of annual budgets before Parliament by the end of February each year (the financial year in India is from 1 April to 31 March). The main tax incentives and policy preferences are announced by the finance minister. Thus, the budget document is the best source for understanding changes in the financial market, then supplemented by RBI reports and publications. The annual budget proposes changes in taxes, government policy in almost all sectors, and budgetary and other allocations for all ministries. The annual budget is passed by Parliament after debate. The tax system is comparatively centralized, and the Ministry of Finance is entrusted to collect taxes.
India (SEBI) was created in 1992 to regulate and supervise the securities market.\textsuperscript{9} In addition, the Insurance Development and Regulatory Authority was established to regulate and supervise the insurance market.\textsuperscript{10}

RBI is the country’s central bank.\textsuperscript{11} While, as per statute, RBI is the monetary authority of the country, it has also been entrusted with work relating to banking supervision by a 1949 act.\textsuperscript{12} RBI had exercised a tight regime of exchange control, particularly under the Foreign Exchange Regulation Act of 1973. However, substantial changes were brought about in the legal framework to enable liberalization through the Foreign Exchange Management Act in June 2000, which replaced the Foreign Exchange Regulation Act. With this, the objectives of regulation were redefined toward facilitating trade and payments as well as the orderly development and functioning of foreign exchange markets.

RBI has gradually withdrawn from the practice of providing refinance options for specific sectors such as agriculture, industry, and export, although legal provisions continue to enable this. RBI has played a secondary role in fiscal policy and planning strategy, and has had to pursue multiple objectives. In addition to the traditional ones of price stability, managing balance of payments, and economic growth, it helps implement plans, promote new monetary and financial institutions, and direct resources to priority sectors.

Currently, the responsibility of regulating the securities market primarily rests with SEBI, but this is shared by the Department of Economic Affairs and the Department of Company Affairs of the Ministry of Finance, and RBI. The Capital Market Division of the Department of Economic Affairs is responsible for formulating policies for the development of the capital market in consultation, inter alia, with SEBI, RBI, and other agencies. It acts as the secretariat for the High-Level Coordination Committee on Financial and Capital Markets, and deals with all organizational matters relating to SEBI. The main laws governing the conduct of participants in the securities market are the Companies Act of 1956, Securities Contracts (Regulation) Act of 1956, SEBI Act of 1992, and Depositories Act of 1996.\textsuperscript{13}

\textsuperscript{9} Established on 12 April 1992, SEBI has formed several committees of eminent experts and market practitioners to support it in the design of reforms for different aspects of securities markets. The regulator posts all of its orders, including those delivered on appeals against the orders, on its website. It has also put timelines for performance of its various functions, such as registration and renewal, on the website. These measures work as a self-disciplining mechanism and provide full transparency to its functioning.

\textsuperscript{10} As per the section 4 of the Insurance Regulatory Authority Act of 1999, the authority is a 10-member team consisting of a chairperson, 5 full-time members, and 4 part-time members, all appointed by the government.

\textsuperscript{11} RBI, established through the RBI Act of 1934, commenced operations in 1935. It draws its powers and responsibilities through other legislation such as the Banking Regulation Act of 1949.

\textsuperscript{12} Similarly, the PRC created a special agency in 2003 for the supervision of its banking industry.

\textsuperscript{13} Securities regulation began in India with the Capital Issues (Control) Act of 1947, which had its origin during World War II to support the war effort. The act was retained with some modifications as a means of control over the raising of capital by companies and to serve goals and priorities of the government; however, as part of the liberalization process, the act was repealed in 1992, paving the way for market-determined allocation of resources.
Banking Sector Reform

Since the BOP crisis, direct lending has been reduced by the government to limit crowding out, thereby increasing credit available to the private sector. Project lending through development finance institutions has also been gradually phased out in favor of bank-led syndications. Banks have shifted their focus to large borrowers and have reduced the proportion of direct agricultural and small-sector loans. Gradual deregulation has freed public sector banks from the control of the Ministry of Finance and RBI, and banks can now operate according to market forces (Hanson 2001).\(^\text{14}\)

However, India’s public sector banks, as well as private banks, are still required to conform to priority sector lending strictures as directed by RBI. Domestic and foreign banks are required to provide 40% and 32%, respectively, of their net bank credit to priority sectors. In addition, public sector banks are required to lend at least 5% of their net bank credit to women.\(^\text{15}\) Credit to SMEs still constitutes 8% of net bank credit and 20% of the priority sector advances by all public sector banks. Sick small-scale industry units are assessed on a case-by-case basis, based on their potential viability, and then credit can be extended to them. Credit to agriculture is also a priority sector, and many schemes have been launched to help farmers. Indian students going abroad can also easily access education loans from public sector banks as well as from private and foreign banks.

In 1993, prudential norms consistent with the Basel I were introduced for India’s banks. In addition, with a view to minimizing risks and improving operational efficiency, norms on corporate good governance in regard to compliance, accountability, transparency, control and reporting, and auditing are being adopted. Reform in the banking sector is being accompanied by significant improvements in regulation and supervision. To aid banks with credit and the background information of borrowers, the Credit Information Bureau (India) Limited was set up in 2000 (Batra 2003).

Major Reforms in the Banking Sector

After the BOP crisis, RBI initiated reforms covering every aspect of the financial sector. The Committee on Banking Sector Reforms, under M. Narasimham’s chairmanship, recommended the privatization of public financial institutions (i.e., making available public sector banks to private shareholders). Banking sector reforms included:

(i) measures for liberalization, such as dismantling the complex system of interest rate controls, eliminating RBI’s prior approval for large loans, and reducing the statutory requirements to invest in government securities;

(ii) measures designed to increase financial soundness, like introducing capital adequacy requirements and other prudential norms for banks and strengthening banking supervision; and

(iii) measures for increasing competition, such as more liberal licensing of private banks and freer expansion by foreign banks.

---

\(^{14}\) With the amendment to the Banking Regulation Act in 1994, public sector banks are permitted to open up 49% of their shareholding equity to the public.

\(^{15}\) The credit extended to women by all public sector banks was 4.95% of the overall net bank credit at the end of March 2007, with 21 banks reaching the target.
Other important reforms include the adoption of prudential norms in terms of capital adequacy, assets classification and provisioning, deregulation of interest rates, lowering of the statutory liquidity and cash reserve ratios, opening of the sector to private participation, permission to foreign banks to expand their operations through subsidiaries, introduction of real-time gross settlement, and liberalization of foreign direct investment (FDI) norms.

The main thrust of the reforms was the creation of efficient, stable financial institutions and the development of the banking industry. Reforms have been undertaken gradually, with mutual consent and wide debate among the participants, and in a sequential pattern that is reinforcing the overall economy. As a result, the reforms have brought about some efficiency, especially in the reduction of interest rates.

**Interest Rate Deregulation**

In April 1992, the government took several steps in the direction of interest rate liberalization. Banks were given the freedom to fix interest rates on term deposits from 46 days to 3 years and over, within the ceiling prescribed by RBI. Six categories of lending rates, all depending on the size of credit, were compressed into three. Interest rates on all money market instruments were left to be determined by the market.

To supplement the 91-day treasury bill available on tap, 182-day auction treasury bills were introduced in 1986 in the wake of the Chakravarty Committee recommendation. In April 1992, 364-day auction treasury bills were introduced, and the government’s market borrowing in dated securities were also put through auction in 1992/93. A reverse repurchase facility for maturity of up to 14 days was introduced in December 1992 (Lahiri 2006).

Interest rates have now been largely deregulated in India except in the cases of savings accounts, nonresident Indian deposits, small loans up to Rs200,000, and export credit. After interest rate deregulation, banks became free to determine their own lending interest rates. As advised by the Indian Banks’ Association (a self-regulatory organization for banks), commercial banks determine their respective benchmark prime lending rates, taking into consideration the actual cost of funds, operating expenses, and a minimum margin to cover the regulatory requirements of provisioning and capital charges and profit margin. These factors differ from bank to bank and feed into the determination of benchmark prime lending rates and the spreads of banks.16

**Nonperforming Loans and Basel I and Basel II Implementation**

In India, nonperforming loans (NPLs) began surfacing in the banking sector in the 1980s. In public sector banks, they reached over 23% of gross lending in 1992/93. Coupled with a sharp drop in the GDP growth rate, this high rate created a dire situation. Within a decade, however, NPL ratios in both the banking sector as a whole and in public sector banks were reduced to half their original values. For 2005/06, the official estimate for absolute values of gross NPLs held by public sector banks was $9.55 billion, or 3.71% of total lending.

---

16 The benchmark prime lending rates of public sector banks declined to 11.5%–12.5% in March 2009 from 12.25%–12.75% in March 2008.
Compared with the PRC, India had a relatively low ratio of NPLs (Hanson 2001). According to Standard & Poor's, Indian banks' ratio of gross nonperforming assets—including NPLs, parts of restructured assets, and foreclosed properties—stood at 8%–10% as of March 2005 (compared with 13.21% for PRC banks as of 31 December 2004).\(^{17}\) Currently, the total NPL ratio has been reduced to around 4% in India and 10% in the PRC.\(^{18}\) Other than the pure commercial risk of operating a business, the root causes of NPLs have been widely recognized as largely systemic in nature, resulting from three converging factors: directed lending, deficient banking operations, and corruption (Lahiri 2006; Roland 2007). In addition to directed lending, the government deficit was financed at controlled interest rates. By 1992/93, India’s public sector banks started experiencing severe capital inadequacy with negative profitability (Batra 2003; Kannan 2004).

The NPL problem was addressed mainly through long-term reforms, but also with the help of short-term remedial measures. Such an NPL resolution strategy has been rated as largely successful, especially when compared to other Asian countries (ADB 2004; Ernst & Young 2004). The main elements were the immediate recapitalization of failing banks and subsequent efforts to establish asset reconstruction companies as short-term measures. Longer-term measures included partially privatizing the banking system, reducing directed lending and political intervention, adopting international standards for best practices in banking operations, and strengthening the regulatory and supervisory framework.\(^{19}\) As a result, Asset Reconstruction Company India Limited (ARCIL), the first asset reconstruction company in India, became operational in 2003.

By the end of 2006, Indian banks adopted international best practice norms as per Basel I standards. Indeed, most public sector banks have overcome the problems of bad loans as reflected in the rapid decrease in the level of nonperforming assets. The capital–risk-weighted asset ratio of India’s banks reached 10.6% by the end of the first quarter of 2007, much above the Basel I norm of 8.0%, underlining the qualitative improvement in the credit profile of the banking system.\(^{20}\)

Basel II compliance is a major driver behind reforms in India’s banking industry. By March 2007, banks were expected to adhere to Basel II international capital adequacy standards. By the end of March 2009, all commercial banks migrated to the simple approaches available under Basel II. Implementation of advanced approaches to Basel II will be completed by 1 April 2012. To achieve this, banks will require greater information-sharing systems and technology to supervise risk. Also, banks will need to strengthen their capital adequacy ratios to avoid imposed restrictions on bank lending.

There is reason to believe that the improvement in terms of nonperforming assets has been largely the result of provisioning or the infusion of capital. This means that if banks required more capital, as they would to implement Basel II norms, they would

---

\(^{17}\) According to China Banking Regulatory Commission, the NPL ratio for the PRC’s banking industry has dropped steadily from 13.21% in 2004 to 6.17% in 2007 and further to 1.58% in 2009.

\(^{18}\) India adopted the 90-day overdue classification rule for denoting a loan as nonperforming in 2004 (ADB 2004).

\(^{19}\) To transfer old NPLs out of public sector banks and to help these banks make a fresh start, the establishment of asset restructuring companies was recommended in the 1998 Narasimham Committee Report (ARCIL 2004).

\(^{20}\) A higher capital adequacy ratio improves the overall health of the banking system.
have to find capital outside of their own or the government’s resources. ICRA (2005) estimates, India’s banks would need additional capital, about Rs120 billion, to meet the capital charge requirement regarding operational risk under Basel II. Most of this capital would be required by public sector banks (Rs90.0 billion), followed by the new generation of private sector banks (Rs11.0 billion) and the old generation of private sector banks (Rs7.5 billion). In ICRA’s view, given the asset growth witnessed in the past and the expected growth trends, the capital charge requirement for operational risk would grow 15%–20% annually over 3 years, which implies that the banks would need to raise Rs180 billion–Rs200 billion over the medium term.21

**Opening to the Foreign Banks**

In its World Trade Organization commitments, India agreed to provide a greater role for foreign banks and a level playing field for private and public banks.22 As a result, many banks have been forced to turn to the capital market to meet their additional regulatory capital requirements. ICICI Bank, for example, has raised around Rs35 billion, thus improving its tier I capital significantly. Many public sector banks—such as Bank of Baroda, Bank of India, Dena Bank, and Punjab National Bank—besides private sector banks have either already tapped the market or have announced plans to raise equity capital in order to boost their tier I capital.

21 Many banks have been forced to turn to the capital market to meet their additional regulatory capital requirements. ICICI Bank, for example, has raised around Rs35 billion, thus improving its tier I capital significantly. Many public sector banks—such as Bank of Baroda, Bank of India, Dena Bank, and Punjab National Bank—besides private sector banks have either already tapped the market or have announced plans to raise equity capital in order to boost their tier I capital.

22 Recently, a road map for the presence of foreign banks in India was released, which sets out the process of the gradual opening up of the banking sector in a transparent manner (see www.rbi.org).
its banking industry is undergoing rapid dismantling of long-standing regulations in preparation for the opening of the sector, which will be completed by the end of 2009. Increases in the presence of foreign banks, private banks, and FDI have fostered a more competitive banking environment. The 2003/04 annual budget increased the limit of FDI in private banks from 49% to 74%, allowing foreign owners greater management control over private banks. Private banks benefit from the increase in FDI because FDI provides much-needed capital at competitive prices.23

Foreign banks currently possess only a marginal portion of the banking market in India (Table 3), 7% of assets, 5% of deposits, and 7% of advances. Foreign presence in the banking sector is expected to increase because of the expanding demand for banking services and the compliance with international standards set forth by World Trade Organization and Basel II agreements. Foreign banks operate quite differently from domestic banks. Fees produce a substantial portion of income—23% on average, compared to 9% each for public and private banks. The cost of deposits for foreign banks is about 4%, which is two points lower than public and private banks. The return on assets for foreign banks is double that of domestic banks. Foreign banks are more competitive due to greater technology use and better risk management.

**Capital Market Reform**

In the last 6 decades, India’s capital markets have evolved from a decentralized and fragmented system of 23 regional stock exchanges into two dominant, primary exchanges: the Bombay Stock Exchange and National Stock Exchange.24 Both are demutualized corporations run by a board of directors and are competing organiza-

| Table 3: Banking Indicators in Fiscal Year 2004 (Rs billion and $ billion) |
|---------------------------------|-----------------|-----------------|---------------|
|                                 | Public Sector Banks | Private Sector Banks | Foreign Banks |
| Assets                          | Rs14,714 ($334.00) | Rs3,673 ($83.00)   | Rs1,363 ($31.00) |
| Deposits                        | Rs12,268 ($279.00) | Rs2,685 ($61.00)   | Rs798 ($18.00)  |
| Advances                        | Rs5,494 ($125.00)  | Rs1,709 ($39.00)   | Rs605 ($14.00)  |
| Investments                     | Rs6,257 ($142.00)  | Rs1,348 ($31.00)   | Rs416 ($10.00)  |
| Income                          | Rs1,376 ($31.00)   | Rs332 ($8.00)      | Rs130 ($3.00)   |
| Net profit                      | Rs165 ($3.80)      | Rs359 ($0.80)      | Rs22 ($0.50)    |

Rs = rupees.
Source: Indian Credit Rating Agency 2005.

---

23 In March 2006, RBI allowed Warburg Pincus to increase its stake in Kotak Mahindra Bank (a private sector bank) to 10%. This is the first time an investor has been allowed to hold more than 5% in a private sector bank since RBI announced norms in 2005 that it must vet any stake exceeding 5%.

24 Since the Bombay Stock Exchange and 22 other exchanges in India were regional exchanges and trading was done mostly among its members, all companies were required to first be listed on their regional exchange before they were listed on the Bombay Stock Exchange. So, in 1992, the National Stock Exchange was established as a result of a government study in 1990s, which recommended the creation of a stock exchange with nationwide interests and, unlike the Bombay Stock Exchange, no regional roots.
Most market participants believe that the existence of two exchanges rather than one leads to a better-performing marketplace. Competition between the exchanges has led to reduced costs, faster innovation, and greater efficiencies, and most participants are opposed to a merger of the exchanges (Kanuk 2007).

International organizations such as the International Organization of Securities Commissions, International Federation of Stock Exchanges, and Financial Stability Forum, organized by the finance ministers and central bank governors of the G7, have helped India promote standards for global best practices. The Financial Institution Reform and Expansion Project of the US Agency for International Development was especially active in promoting the practices of US exchanges and regulation from 1994. The spread of these global norms for market-based practices empowered the Government of India to promote reform over the resistance of recalcitrant brokers by undermining their claim to a monopoly of knowledge about market practices.

Early reforms in the stock market were accelerated by the 1992 Harshad Mehta stock market scam, which revealed serious weaknesses in the regulatory mechanism. The establishment of SEBI in 1992, as well as the implementation of advanced electronic trading systems in the two primary stock exchanges; demutualization of securities issues, allowing for straight-through processing and electronic settlement on a T+2 settlement basis; implementation of state-of-the-art, built-in market security and safeguard mechanisms to insure the safety and integrity of the markets; and the

---

25 This structure, mandated by the Securities Laws (Amendment) Act of 7 January 2005, effectively segregated the ownership, management, and trading rights at the exchange from one another, thus removing the concerns about conflict of interests.
development of a sophisticated set of securities regulations monitored and enforced by SEBI should prevent such a scam from occurring again (Kanuk 2007).26

As a result of eased restrictions and market pricing of shares, the capital market has emerged in the last decade as the most important source of long-term capital for the corporate sector. In the 1970s, the average annual mobilization from India’s capital market used to be around Rs9 billion, which jumped to Rs216 billion in 1993/94. The number of listed companies increased from 5,968 in March 1990 to about 10,000 by May 1998, and market capitalization has grown almost 11 times during the same period (RBI 2007).27

**Equity Market and Portfolio Investment**

If the PRC is known for its huge FDI attraction in the past 20 years, then India has been in the news for attracting portfolio investment from foreign institutional investors (FIIs).28 Foreign portfolio investment, representing foreign funds coming into primary and secondary share markets, accounted for the bulk of the growth in the equity inflows and saw a huge surge in interest, particularly in 2004/05, when investment increased more than 10 times to $11.38 billion from less than $1 billion in 2003/04. It is estimated that since the 1990s, India has attracted more than $70 billion from FIIs. FII inflows into India started in January 1993, and increased steadily throughout the 1990s and beyond to reach an annual peak of around $11 billion in 2005/06. Since 1993/94, such inflows have always been positive on an annual basis, except in 1998/99 due to the Asian financial crisis. The accumulated FII inflows in the first 4 months of 2007/08 (from April to July 2007) amounted to $8.6 billion, 65% higher than the total net inflows in 2005/06. The largest chunk of this inflow came in July 2007, when FII net purchases of equity amounted to $5.9 billion. The sources of FII have been diverse, but mainly dominated by the US (Figure A.7).

Among the factors contributing to the recent surge in FII investments are improved regulatory standards, high-quality disclosure and corporate governance requirements,

---

26 SEBI promulgates rules and regulations governing various types of products and participants in the capital market, as well as activities, such as insider trading and takeover. It regulates the securities market through four departments: (i) Market Intermediaries Registration and Supervision Department, which oversees the registration, supervision, compliance monitoring, and inspection of all market intermediaries for all segments of the market, including equity derivatives and debt; (ii) Market Regulation Department, which is responsible for formulating new policies and supervising the operation of securities exchanges; their subsidiaries; and market institutions, such as clearing and settlement organizations; and depository for all instruments except derivatives; (iii) Derivatives and New Product Department, which approves the creation and introduction of new derivative products and supervises trading for derivative operations of the stock exchanges; and (iv) Integrated Surveillance Department, which monitors activities of the cash and futures and options markets and generates detailed reports at the end of each day. The department also monitors and analyzes abnormal trading patterns, and, if suspecting that something is amiss, initiates appropriate action.

27 Market turnover measured as percentages of annual GDP stayed in the single digits from 1991/92 to 1995/96, yet it grew steadily from 25.5% in 1996/97 to 115.2% in 2000/01; the ratio dropped as low as 38.4% in 2001/02 because of turnover correction from 2000/01 to 2001/02, yet it grew steadily to nearly 100% in 2006/07 (RBI 2007).

28 FII is defined as an institution established or incorporated outside India to invest in Indian securities. FIIs include asset management companies, pension funds, mutual funds, and investment trust as nominee companies, incorporated or institutional portfolio managers or their power of attorney holders, university funds, endowment foundations, charitable trusts, and charitable societies. FIIs must register with SEBI and comply with the RBI exchange control regulations.
accounting standards, shortening of settlement cycles, efficiency of clearing and settlement systems, risk management systems, as well as product diversification through the introduction of derivative products. This is reflected in the higher weight awarded to India by the Morgan Stanley Country Index.29

Regulations require FIIs to register with SEBI and to obtain approval from RBI to buy and sell securities, open foreign currency and Indian rupee bank accounts, and remit and repatriate funds. Once SEBI registration has been obtained, an FII does not require any further permission to buy or sell securities or to transfer funds in and out of the country, subject to payment of applicable taxes. Foreign investors, whether registered as FIIs or not, may also invest in Indian securities outside the FII process. Such investment requires case-by-case approval from the Foreign Investment Promotion Board in the Ministry of Commerce and Industry and RBI, or only from RBI depending on the size of investment and the industry in which the investment is to be made. Investment in Indian securities is also possible through the purchase of global depository receipts. Foreign currency convertible bonds and foreign currency bonds issued by Indians that are listed, traded, and settled overseas are mainly denominated in US dollars. Foreign financial service institutions have also been allowed to set up joint ventures in stock brokering, asset management, merchant banking, and other financial services firms with Indian partners.30

There are significant differences between the government debt markets of the PRC and India. First, the level of outstanding amounts of government debt as a percentage of GDP is much lower in the PRC (around 13% in 2006) than in India (around 33%). Secondly, outright trading of government bonds is much less active in the PRC than in India, as the annual trading value as a percentage of outstanding central government bonds was around 0.1% in the PRC from 2004 to 2006 as compared to 0.76%–1.20% in India during the same period. In the PRC, because of lack of liquidity in the government bond market, trading largely concentrates in the repo market, as the repo market consists about 90% of total repo and outright central government securities transactions between 2003 and 2006. Finally, although the corporate debt market is not well developed in either India or the PRC, India’s corporate bond market is better than that of the PRC, because the corporate debt market was about 14% of the total debt market in India, yet only 3% in the PRC at the end of June 2007 (Reddy 2007; Zhang 2008).

---

29 A market capitalization–weighted index maintained by Morgan Stanley Capital International and designed to provide a broad measure of stock performance throughout the world.

30 The main features of the FII investment policy are (i) FIIs are required to allocate their investment between equity and debt instruments in the ratio of 70:30, but an FII can declare itself a 100%-debt FII, in which case it can make its entire investment in debt instruments; (ii) FIIs can buy or sell securities on stock exchanges and invest in listed and unlisted securities outside stock exchanges where the price has been approved by RBI; (iii) no individual FII or subaccount can acquire more than 10% of the paid-up capital of an Indian company; (iv) all FIIs and their subaccounts taken together cannot acquire more than 24% of the paid-up capital of an Indian company; and (v) Indian companies can raise the 24% ceiling to the sector cap or statutory ceiling as applicable by passing a resolution by their boards of directors, followed a special resolution to that effect by their general bodies. No permission from RBI is needed as long as FIIs purchase and sell on a recognized stock exchange. All nonstock exchange sales or purchases require RBI permission.
Government and Corporate Debt Market

An integral aspect of financial liberalization initiated in the early 1990s was the process of reforming the debt market. Two main catalysts for this reform were (i) the realization that the growing budget deficit would have to be funded through a liquid, efficient government securities market; and (ii) the recognition that sustained economic growth will require a significant improvement of the nation’s infrastructure, which will require a deep, liquid domestic debt market (Kanuk 2007).

The government is the largest issuer of debt. The growing national budget deficit has required the increased issuance of government securities. The annual primary issuance of government debt increased 18 times during the 15 years since the reform process began, from Rs90 billion ($2 billion) in 1991/92 to Rs1,600 billion ($36 billion) in 2006/07. In addition, the growing needs of state governments have led to their growing issuance in the debt market. The annual issuance of state government debt has increased as much as 20 times, from Rs26 billion ($0.57 billion) in 1991/92 to a peak of Rs505 billion ($11 billion) in 2004/05 (RBI 2007).

Although India’s private corporate sector raises a large part of its financial requirements through bank loans, there has been increasing reliance on both the debt and equity markets.31 Within the debt market, especially the corporate bond market, issuances by state-owned public sector undertakings have persistently outstripped those by private companies. Further, there has been a strong preference for the private placement route for corporate bond issues rather than public issues, owing to less onerous regulatory requirements (disclosures and registrations) in private placements. Also, the considerably higher costs associated with public issuance deter corporate entities from accessing funds through this route. Recently, several innovations have taken place in the corporate bond market, such as securitized products, corporate bond strips, a variety of floating rate instruments with floors and caps, and bonds with embedded put and call options. However, the secondary market has not yet developed in the debt segment of the capital market. Furthermore, the corporate debt market remains underdeveloped, as large domestic institutional investors—such as pension funds and the insurance sector—are restricted from allocating large portions of their investment funds in the corporate bond segment.

Several policy initiatives were undertaken during the 1990s to activate the corporate debt market in India.32 The interest rate ceiling on corporate debentures was abolished in 1991, paving the way for market-based pricing of corporate debt issues. To improve the quality of debt issues, ratings were made mandatory for all publicly issued debt instruments, irrespective of their maturity. Further, the role of trustees in bond and debenture issues has strengthened over the years. All privately placed debt

---

31 Unlike most international mergers and acquisitions that typically feature stock swaps in the financing arithmetic, Indian acquirers have, for the most part, paid cash for their targets, helped by a combination of internal resources and borrowings. Share swaps have not yet emerged as a favored payment option in India, except in a few large transactions in the software industry.

32 The corporate debt market in India has existed since its independence from the United Kingdom. Public listed companies have been raising capital by issuing debt securities. In 1985/86, state-owned public sector undertakings began issuing bonds. However, in the absence of a well-functioning secondary market, such debt instruments remained illiquid. In recent years, because of falling interest rates and adequate availability of funds, corporate debt issuance has shown a noticeable rise, especially through private placements.
issues are required to be listed on the stock exchanges and follow disclosure requirements. However, despite the policy initiatives, corporate debt still constitutes a small segment of the debt market in India. Whereas the primary market for debt securities is dominated by the private placement market, the secondary market for corporate debt is characterized by poor liquidity, although this has improved in recent years.\textsuperscript{33}

Corporations in India continue to prefer private placement of debt issues rather than floating public issues.\textsuperscript{34} The dominance of private placement has been attributed to several factors, such as ease of issuance, cost efficiency, and primarily institutional demand. About 90% of outstanding corporate debt has been privately placed. In the private placement market, over 60% of issuances are by financial institutions and banks, in both the public and private sectors. Public sector companies accounted for 58% of privately placed issues from 2004 to 2006, dropping to 42% in 2006/07 (RBI 2007).

Before 1990, to provide cheap capital for state enterprises, the government had established a well-knit structure of national- and state-level development financial institutions for meeting the requirements of medium- and long-term finance of all ranges of industrial units. To enable term-lending institutions to finance industry at concessional rates, the government and RBI gave them access to low-cost funds—but this did not produce the expected result. The situation changed significantly after financial sector deregulation in 1991.\textsuperscript{35} Development financial institutions no longer enjoyed their protective policy climate and had no access to concessional sources of finance, like government–guaranteed bonds or budgetary support. Thus, they found it difficult to remain viable by raising funds from the market and competing with commercial banks. Moreover, banks started substantially increasing their term lending with the help of low-cost deposit funds. During the 1990s, therefore, development financial institutions were increasingly withdrawing themselves; others, like ICICI Bank and IDBI Bank, merged with commercial banks and lost their original identity. On the other hand, the banking sector witnessed sweeping changes, including elimination

\textsuperscript{33} In 2005/06, 139 companies accessed the primary market through public and rights issues and mobilized more than Rs273 billion, compared to 60 companies raising more than Rs282 billion in 2004/05. The sector-wise classification reveals that private sector garnered almost Rs202 billion through 131 issues in 2005/06, whereas the public sector mobilized almost Rs72 billion through 8 issues. Industry-wise, banks and financial institutions continued to dominate, mobilizing more than Rs124 billion (45.4%) in 2005/06 through 12 issues.

\textsuperscript{34} Resource mobilization through private placement picked up from over Rs133 billion in 1995/96 to over Rs1,455 billion in 2006/07.

\textsuperscript{35} To provide greater flexibility to Indian companies for investments abroad and to rationalize existing facilities, the overseas investment limit (total financial commitments) for Indian companies was enhanced from 200% of their net worth to 300%, as per the last audited balance sheet. The limit for listed Indian companies was further raised from 25% to 35% of net worth for portfolio investment abroad in listed overseas companies. The aggregate ceiling on overseas investment by mutual funds was increased from $3 billion to $4 billion. No prior approval of RBI is required for opening offices abroad. For initial expenses, authorized dealer banks have been permitted to allow remittance up to 15% of the average annual sales, income, or turnover during last 2 financial years or up to 25% of net worth, whichever is higher. For recurring expenses, remittance up to 10% of the average annual sales, income, or turnover during last 2 financial years is allowed. Within these limits, authorized dealer banks can allow remittance by a company even to acquire immovable property outside India for its business and for residential purpose of its staff. Partnership firms registered under the Indian Partnership Act of 1932 and with a good track record are permitted to make direct investments outside India in any bona fide activity with 200% of their net worth under the automatic route.
of interest rate controls, reductions in reserve and liquidity requirements, and an overhaul in priority sector lending. Commercial banks gradually diversified into several new areas of business such as merchant banking, mutual funds, leasing, venture capital, and other financial services.

In India, external capital borrowing is permitted by the government for providing an additional source of funds to Indian corporations. The Ministry of Finance monitors and regulates such borrowing through policy guidelines. The discouragement of external debt has restricted domestic entities’ ability to issue bonds on international markets and the entry of foreign investors to the domestic bond market. Moreover, the restrictions on purchases by foreigners in the corporate and government bond markets are much more strict. Hence, the market for private bonds remains underdeveloped (Lane and Schmukler 2006). In contrast, the approach to equity inflows has been much more liberal, and restrictions on FDI inflows have been relaxed progressively.

The distinctive characteristic of equity flows into India, however, is the relatively high level of portfolio equity financing. India’s broad domestic institutional investor base has aided the entry of FIIs that are permitted to take partial stakes in the equity of quoted Indian enterprises. Capital outflows also are restricted, although the system is being liberalized (Patnaik and Shah 2006). In particular, Indian banks are not permitted to acquire external assets, but rather are encouraged to hold government bonds, thereby lowering the cost of financing public deficits. Accordingly, current constraints on asset allocation make official reserves the predominant component of foreign assets.

Indian companies, both large and small, have been allowed to access the equity markets abroad by way of US and global depository receipts since 1992. These issuances have picked up steadily, with the amount raised in 2005/06 exceeding $2.5 billion.36 Indian companies were also allowed to borrow from lenders and investors outside India through external commercial borrowing, which emerged as an important source of finance.37 The Ministry of Finance monitors and regulates the access to global capital markets to provide flexibility in borrowing by Indian corporate entities, but at the same time, to maintain limits for total external borrowing and to ensure prudent end-use of the funds raised. With caps on external commercial borrowing relaxed, and interest rates ruling higher in the domestic market, Indian firms have been increasingly taking the syndicated loan route to borrow money abroad at relatively lower interest rates to finance their operations and investments.

Another important feature in India is the existence of business groups within which effective control is exercised by the same insider group of shareholders. Business groups are of long-standing stature and vary considerably in size—from the Tata and Birla groups with assets of over Rs100 billion, to groups that consist of just a few small companies. These business groups are known for creating their own

36 Internal funds have been the main source of investment financing for the PRC corporate sector. According to Kuijs (2006), PRC enterprises saved 20.0% of GDP in 2005. Their level of investment, however, was much higher than that of India, which was 31.2% of GDP in 2005. The most important supplier of external finance has been the banking sector. Allen, Qian, and Qian (2008) showed that other important channels of external financing have been FDI (especially for private sector enterprises) and the state budget (for state-owned enterprises).

37 External commercial borrowings include commercial bank loans, buyers’ credit, suppliers’ credit, securitized instruments such as floating rate notes and fixed rate bonds, credit from official export credit agencies, and commercial borrowings from the private sector window of multilateral financial institutions.
internal capital markets—typically, during times of high interest rates, the best group company would borrow externally and then pass on the money to less profitable group companies as intercorporate loans.

Overseas acquisitions are funded through a variety of sources, such as the withdrawal of foreign exchange in India, capitalization of exports, balances held in exchange earners’ foreign currency (EEFC) accounts, share swaps, external commercial borrowing and foreign currency convertible bonds, and US and global depository receipts. Regarding external debt, the policy on external commercial borrowings allow for overseas acquisitions within the overall limit of $500 million per year under the automatic route. The overall remittances from India and nonfunded exposures should, however, not exceed 200% of net worth. In general, this policy has served India well. A substantial portion of investments is occurring through special-purpose vehicles set up abroad for this purpose. Existing wholly owned subsidiaries and joint ventures are being used to fund acquisitions through leveraged buy-out routes, and such transactions are not currently captured in overseas investment statistics. The major investment destinations appear to be the US and European markets. Tax havens, like Mauritius and the Cayman Islands, also feature in Indian acquisitions or setting up new wholly owned subsidiaries and joint ventures.38

Nonresident Indians and persons of Indian origin are permitted to purchase and/or sell shares and/or convertible debentures of Indian companies on stock exchanges under a portfolio investment scheme.39 For this purpose, the nonresident Indian or person of Indian origin has to apply to a designated branch of a bank, which deals in portfolio investment. All sale and purchase transactions are routed through the designated branch. A nonresident Indian can purchase shares up to 5% of the paid-up capital of an Indian company.

Current Account and Capital Account Reform

In September 1975, the government introduced an exchange rate system for the Indian rupee, based essentially on trade weights, involving five currency units, with a permissible range of 2.25% on either side. The weights were revised in 1979, 1983, and 1984, although the currency composition broadly remained the same. The band, however, was extended from 2.25% to 5.00% in 1979, and again to 10.00% in 1986 (Lahiri 2006).

In response to the BOP crisis, the Indian rupee was devalued by 8.5% and 10.5% vis-à-vis the US dollar on 1 and 3 July 1991 (in total, 19% devaluation), respectively. India introduced the liberalized exchange rate management system on 1 March 1992, which led to the dual exchange rate and partial convertibility of the Indian rupee. On 1 March 1993, India unified its exchange rate regime, and by August 1994, it

38 In recent times, sustained growth in corporate earnings has boosted the profitability and strengthened the balance sheets of Indian companies. This has, in turn, strengthened their credit ratings and ability to raise funds overseas.

39 The government has provided some special privileges to nonresident Indians in areas of foreign exchange and financial sector and real estate investments. These privileges are over and above the rules applicable to nonresident foreigners. Persons of Indian origin and overseas citizens of India have been given same privileges in economic fields as nonresident Indians, except for investment in agricultural land. Nonresident Indians, overseas citizens of India, and persons of Indian origin are allowed to maintain bank accounts in India, invest in securities and shares of Indian firms, and invest in immovable properties in India.
achieved current account convertibility and accepted the obligations under IMF from August 1994. The Indian rupee was made fully convertible in the current account of the balance of payments 2 years earlier than the yuan, in 1996. This was a significant attempt at liberalizing the external account.

Indian foreign exchange markets became active only in the 1990s with floating of the currency in March 1993, following the recommendations of the Report of the High Level Committee on Balance of Payments. The Indian rupee–US dollar exchange rate fluctuated from 1991 onward and depreciated against the US dollar from 1991 until 2002. Specifically, the Indian rupee depreciated against the US dollar 52.5% between January 1991 and July 1997; and it depreciated against the US dollar further for 26.7% from 2 July 1997 to 2 July 2002. The Indian rupee began to show appreciation trend from 2002, similar to the yuan.

As far as the capital account liberalization is concerned, controls on transactions are being removed only selectively. The Tarapore Committee, set up by RBI in 1996 for advising on a road map for capital account liberalization in India, recommended a gradual approach with milestones such as sufficient foreign exchange reserves, low inflation, low nonperforming assets of banks, and low fiscal deficits. India, accordingly, has been following a carefully calibrated approach in the matter. Its stand has been vindicated by the experience of other East and Southeast Asian countries, which pursued aggressive capital account liberalization without adequate financial sector and corporate reforms, and suffered major economic setbacks in 1997.

While virtually all restrictions on foreign nondebt capital inflows into India have been lifted (except for a few sector caps), India continues to maintain restrictions on debt inflows, particularly of short maturities, and outward investment (Lahiri 2006). For fuller capital account convertibility, the Tarapore Committee II has already submitted its report, on which the government is deliberating. It may take another few years for India to realize the full capital account convertibility.

**Derivatives Market**

The trading of derivatives in India was introduced in June 2000 by the launch of the Bombay Stock Exchange–Sensex futures contract. Over the next 2 years, both stock exchanges in India launched the trading of futures and options contracts for various indexes, specific sectors, and individual stocks. Beginning with virtually no derivatives turnover in 2001, the National Stock Exchange has emerged as India’s dominant

---

40 The significant reforms in the area of exchange control can be summarized as follows. Exchange controls on current account transactions were progressively relaxed, culminating in current account convertibility. FIIs were allowed to invest in Indian equities, subject to restrictions on maximum holdings in individual companies. Initially, there were severe restrictions on foreign investment in debt securities, but these were progressively relaxed. Indian companies were allowed to raise equity in international markets, subject to various restrictions. They were then allowed to borrow in international markets, subject to a minimum maturity, a ceiling on the maximum interest rate, and annual caps on aggregate external commercial borrowings by all entities. Finally, Indian mutual funds were permitted to invest a small portion of their assets abroad, and Indian companies were given access to long-dated forward contracts and to cross-currency options.

41 As of the end of August 2007, total foreign exchange contracts outstanding in the banks' balance sheet amounted to $110 billion, of which almost 84% were forward and the rest were options.
derivatives marketplace and has witnessed explosive growth. Derivative turnover was more than double that of the equity market turnover by 2004, and at more than $1,565 billion in 2006, derivative turnover was more than 3.5 times the $425 billion equity markets turnover in that year.42

The Securities Contract (Regulation) Act of 1956 was amended in December 1999 to include derivatives in the definition of securities. The L. C. Gupta Committee constituted by SEBI on 18 November 1996 recommended that derivatives be declared as securities so that the regulatory framework for securities could govern derivatives as well. Subsequently, SEBI framed bylaws permitting derivatives trading in separate segments or exchanges, as well as for the operations of clearinghouses and corporations. SEBI permitted derivatives segments in both stock exchanges, and their clearinghouses and corporations began derivatives trading in approved derivative contracts. In the beginning, SEBI permitted trading in index futures contracts based on S&P CNX Nifty and the Bombay Stock Exchange–Sensex indices. Subsequently, SEBI approved options trading based on these two indices, as well as options based on individual securities. The futures contracts are based on the popular benchmark S&P CNX Nifty.43

Stock index futures were the first equity derivatives launched in the two stock exchanges as early as June 2000. Data collected by SEBI indicate that stock index futures turnover grew tremendously from 2000/01 to 2006/07, with an average annual growth rate of 193.8%. The 2006/07 annual turnover rose to the level of 89.4% of the corresponding equity turnover and to 83.5% of the corresponding GDP of the same year.

Stock index options were launched at the stock exchanges 1 year after the stock index futures in June 2001. Data collected by SEBI indicate that stock index options turnover grew from 2001/02 to 2006/07 with an average annual growth rate of 190.2%, almost the same as the corresponding average annual growth rate. In the case of stock index futures, the 2006/07 annual turnover rose to the level of 27.3% of the corresponding equity turnover, and to 25.5% of the corresponding GDP of the same year.

Stock options, or options written on individual stocks, were launched at the stock exchanges 1 month after the stock index options in July 2001. The stock options turnover rate grew significantly from 2001/02 to 2006/07, with an average annual growth rate of 50.3%. The annual turnover rose to the level of 10.7% of the corresponding equity turnover in the first full year of trading in 2002/03, yet the ratio declined to 6.7% in 2006/07. The annual turnover increased to 9.1% of the corresponding GDP in 2003/04, and then decreased to 6.2% in 2006/07. The reason for the seemingly less-attractive growth of stock options is very likely due to the tremendous growth of stock futures.

In 2006, 88% of the derivatives turnover was in futures, two thirds of which were stock futures, with options turnover representing only 11% of the derivatives turnover.42

S&P CNX Nifty options are European-style option contracts based on the benchmark S&P CNX Nifty. They have a maximum trading cycle of 3 months. The contract size, again, cannot be less than Rs200,000 at the time of introduction. The base prices are determined on the basis of the Black-Scholes model. Operating ranges are kept at 99% of the base price. The futures contracts are available on 117 securities. The contracts expire on the last Thursday of the expiry month. Operating price bands are kept within +/-10%.43
RBI began to promote interest rate derivatives as early as July 1999, about 7 years earlier than the People’s Bank of China. With a great effort of more than 8 years, interest rate derivatives developed to a certain level, with annual total trading value around $750 billion in 2007, more than 25 times larger than the corresponding PRC figure of $28.77 billion for 2007. Despite great achievements compared to the PRC, interest rate derivatives are the least-developed area compared with foreign exchange and equity derivatives.

**Mutual Fund Market Reform**

Indian investors have been able to invest through mutual funds since 1964, when the Union Trust of India was established. Indian mutual funds were organized through the Indian trust acts, under which they have enjoyed certain tax benefits. Between 1964 and 1987, the Union Trust of India had a complete monopoly in the mutual fund industry. Between 1987 and 1993, the sector was opened to public sector mutual funds set up by government–owned banks, life insurance companies, and the General Insurance Corporation of India. In 1993, the industry was also opened to participation by private sector players, which brought competition to the mutual fund industry. This has resulted in the introduction of new products and improvement of services.

The notification of the SEBI (Mutual Fund) Regulations of 1993 brought about a restructuring of the mutual fund industry. An arm’s-length relationship is now required among the fund sponsor, trustees, custodian, and asset management company. This is in contrast to the previous practice where all three functions—trusteeship, custodianship, and asset management—were often performed by one body, usually the fund sponsor or its subsidiary. The regulations prescribed disclosure and advertisement norms for mutual funds, and, for the first time, permitted the entry of private sector mutual funds. FIIs registered with SEBI may invest in domestic mutual funds, whether listed or unlisted.

The mutual fund industry of India, which has gone through a host of reforms through regulatory interventions, has some outstanding features such as benchmarking mutual fund schemes, valuation norms, uniform cutoff time, and comprehensive risk management. All intermediaries in the securities market are now registered and regulated by SEBI. A code of conduct has been prescribed for each intermediary as well as for their employees, in addition to applicability of proper personal regulatory standards. Further, capital adequacy and other norms have been specified, and a system of monitoring and inspecting operations has been instituted to enforce compliance. Disciplinary action is taken for violation of any ground rules. All intermediaries are mandated to have a compliance officer, who reports noncompliance observations directly and independently to SEBI.

**Insurance and Pension Fund Reforms**

The insurance sector (including pension schemes) was a public sector monopoly at the start of the reforms. The need to open the sector to private insurance companies was recommended by an expert committee in 1994, but there was strong political resistance. Only in 2000 was the law finally amended to allow private sector insurance companies, with foreign equity allowed up to 26%, to enter the field. The independent Insurance Development and Regulatory Authority was established, and 10 new life
insurance companies and 6 general insurance companies—many with well-known international insurance companies as partners—started to operate. The development of an active insurance and pension industry offering attractive products tailored to different types of requirements could stimulate long-term savings and add depth to India's capital markets. However, these benefits will only become evident over time.

The pension fund market is another segment that is undergoing regulatory changes. The market is estimated to be worth Rs10 billion, but the true potential is much larger. Private players have been permitted, leading to the emergence of a wide range of companies, including life insurance companies, banks, mutual funds, and private insurance companies offering pension products. However, one factor, which has so far constrained the growth of pension funds, is their inability to invest in equity instruments. At present, investments by pension funds are restricted to central and state government securities, special deposit schemes, bonds of public sector undertakings and public sector financial institutions, and certificates of deposits with banks. This restriction has inhibited the emergence of long-term players in the capital market. The government is now considering allowing private pension funds with three kinds of portfolios and different allocations in bond and equity instruments.

Other major changes are underway in this segment, including the establishment of an independent pension fund regulatory and development authority that has been approved to oversee and implement the process of pension reforms, including establishing guidelines on the number of players, prudential norms, investment criteria, and the capital requirement for fund houses. At present, there is an interim pension regulator. The government is also considering opening up pension fund management to 100% FDI participation. Some international pension funds have recently been given FII status and are now entering the Indian market.44

**Fiscal Policy Reform**

**Macroeconomic Management**

India's growth in recent years has been mainly driven by domestic consumption, contributing almost two-thirds of overall demand, while investment and export demand is also accelerating. Almost one-half of the incremental growth in real GDP in 2006/07 was on account of final consumption demand, while around 42% was due to the rise in real gross fixed capital formation. The investment boom has come from the creation of fixed assets, and this phenomenon has been most pronounced in the private corporate sector, although fixed investment in the public sector also picked up. According to an estimate by the Prime Minister's Economic Advisory Council, the investment rate crossed 35.0% in 2006/07 from 33.8% in 2005/06.

From a near absence of any private capital flows until 1992, today private inflows constitute a main proportion of total flows in India. Up to 1991, the official flows, representing grants and loans from bilateral and multilateral sources, accounted for

---

44 For instance, the United Nations Pension Fund, which is one of the world’s largest funds with assets worth nearly $26 billion, entered India’s market in August 2004. It was the third big fund to come into India in 2004.
75%–80% of total inflows. As private capital inflows increased sharply in the early 1990s following the ease of controls on capital movements, the proportion of external assistance declined to about 20% and further to below 5% by the late 1990s.

Although capital inflows have helped the economy to strengthen its foreign reserves, a significant proportion of inflows were short-term portfolio flows, which were large enough to destabilize the foreign exchange market. The surge in capital inflows beginning from 1993 put excessive pressure on the value of the Indian rupee. If the exchange rate regime was a pure float, increasing inflows would have led to an appreciation of the Indian rupee and a widening current account deficit due to an increase in imports.

However, RBI has chosen to intervene in the foreign exchange markets to absorb the excess US dollars on a regular basis. The intervention in the foreign exchange markets was often in excess of $2 billion a month, and in 1997, exceeded $14 billion (Khanna 1999). This resulted in constantly increasing foreign exchange reserves with RBI. The large inflows of foreign capital led to three episodes of real appreciation in the value of the Indian rupee after 1992, coinciding with capital surges in 1993–1995, 1996, 1997, and 1999–2000, when the real exchange rate appreciated by 10.7% (in August 1995), 14% (in 1997) and by 5% in 2000/01 over the March 1993 level (Khanna 2002).

**Budgetary Reform**

The period of India's gradual liberalization was not only characterized by rising capital inflows and appreciation pressures. There were at least three depreciation episodes that were initiated by a number of domestic and external events. Liberalization seemed to have a stabilizing effect on interest and exchange rates. Following the

---

45 India's current account deficit, which peaked at 3% of GDP in 1991, improved and was below 1% most of the decade. India saw a surplus in its current account in 2001/02. Furthermore, portfolio flows began in 1993, and India continued to receive an average of $2.5 billion portfolio investment each year until the Asian financial crisis in 1997/98. In 1998, the Indian stock market experienced an outflow reaching $61 million, but soon the inflows went back to the $2 billion–$3 billion per year level.

46 The Indian rupee came under stress in the second half of 1995. An indication of the widening of the current account deficit, a minor decline in capital flows due to political uncertainty, a quick change in the government, and the pronounced appreciation of the US dollar against major currencies triggered market expectations and resulted in depreciation of the Indian rupee from about Rs31.50 in April 1995 to about Rs35.60 per US dollar in October 1995. Following intervention by RBI, the Indian rupee stabilized in the range of Rs34–Rs36. The 1997 episode in India was foreign–originated, which was caused by a small outflow of portfolio investment from the Indian stock market due to the Asian financial crisis. The intervention of RBI could not restore the confidence in Indian rupee, and exporters delayed their repatriations in anticipation of further depreciation. RBI turned to the money market and increased the bank rate, raised the cash reserve ratio, imposed a surcharge on import finance, and tightened export credit. This resulted in a sharp increase in the short-term interest rate, with the interbank call money rates rising to a historical high of 50%. The private sector also found it much more difficult to raise funds from banks, and real interest rates in the economy continued to be higher than ever. Real interest rates in 1990s were as high as 6%–9% compared to 1%–2% in the 1980s (Khanna 1999). The depreciation of the Indian rupee by 5.8% in the first three quarters of 2000 was due to the rising import demand given high oil prices. In all three episodes, RBI intervened both in the spot and forward markets for foreign exchange by selling a large amount of US dollars. The interventions were significant, and RBI sold about $2 billion–$5 billion in the spot and an additional $3 billion–$5 billion in the forward market.
liberalization of current accounts and a reduction of controls on capital flows, both foreign exchange reserves and stock market returns increased. However, both variables became more volatile, and the difference was statistically significant.

A major problem in India’s financial system was large fiscal deficits, both at the central and state levels. In 1984/85, the fiscal deficit of the central government reached an all-time high of 8.5% of GDP. At the beginning of 2007/08, the combined national debt of the central and state governments stood at 82% of GDP, representing a 20% increase over the past 10 years. In addition, there was a central government deficit of 4.2% of GDP in 2006/07. Parliament recently passed a law to control the rising central and state budget deficits and set a target of reducing the central deficit to 3.8% of GDP in 2007/08.

Fiscal management has significantly improved, consistent with targeted reduction in fiscal deficit indicators after the adoption of the Fiscal Responsibility and Budget Management Act in 2003. State government finances have also exhibited much improvement since 2003/04, guided by fiscal responsibility legislation. With the gross fiscal deficit of the central government budgeted at 3.3% of GDP in 2007/08, the Fiscal Responsibility and Budget Management Act target of 3% by 2008/09 appears to be feasible. The revenue deficit is budgeted at 1.5% of GDP for 2007/08; the act envisages the elimination of revenue deficit in 2008/09. With the significant strengthening of the current and capital accounts, the foreign exchange reserves have more than doubled from $76.0 billion at the end of March 2003 to $228.8 billion as of 31 August 2007 and further to $252 billion at the end of March 2009.

**Inflation-Control Mechanism**

Being a democracy, the government has the first and foremost responsibility to check inflation and to limit it to below 3.5%–4.0%. Inflation is a politically sensitive subject. The Ministry of Finance, along with RBI, coordinates and takes policy measures to control the inflation rate. RBI has, of late, used the cash reserve ratio as a main instrument of monetary control to counter inflationary pressures arising from large and continuous budget deficits, which are monetized to a large extent. Perhaps the single most important factor accounting for the growth in the monetary base has been RBI’s credit to the government, arising from the need to finance government investment expenditures. A large portion of this credit comes from RBI’s holding of government securities.47

High growth in the last 4 years has been accompanied by a moderation of inflation. The headline inflation rate, in terms of the wholesale price index, has declined from an average of 11.0% during 1990–1995, to 5.3% during 1995–2000, and to 4.9% during 2003–2007. The trending down of inflation has been associated with a reduction in inflation volatility, which is indicative of well-anchored inflation expectations, despite the shocks of varied nature. Although inflation based on the wholesale price index initially rose to above 6.00% in early April 2007, it eased to 3.79% by 25 August 2007. Preemptive monetary measures implemented since mid-2004, accompanied by fiscal and supply-side measures, have also helped contain inflation.

---

47 The average rate of change in RBI’s credit to the government was the highest in the 1980s at 19.08% after remaining stable at about 9.00% for the previous 2 decades. There has been no ceiling since 1941—or maturity requirements since 1951—for RBI's holding of government securities.
The policy preference for the period ahead is strongly in favor of price stability and well-anchored inflation expectations with a view to containing inflation close to 5% in 2007/08 and in the range of 4.0%–4.5% over the medium term. Monetary policy in India will continue to be vigilant and proactive in the context of any increase in global uncertainties that pose threats to growth and stability in the domestic economy.

**Summary and Suggestions**

Due to reforms carried out since 1991, a major transformation has occurred in India’s economy. With an economy already integrated in the global market, the free flow of foreign capital has helped India overcome economic constraints and grow at a faster rate than the preliberalization period. At the same time, however, it has made the economy more vulnerable to external shocks.

An early success of the reforms was the speed with which exceptional financing was mobilized from multilateral and bilateral sources to avert what at one stage looked like an imminent default on the country’s external obligations. Subsequently, currency devaluation, trade reforms, and the opening up of the economy to capital inflows helped strengthen the BOP position. Substantial reserves were built up out of nondebt-creating capital inflows.\(^{48}\)

The 1991 reforms were notable for the virtual elimination of the industrial licensing regime, reduction of the statutory peak rate of import tariffs from 400% in 1990 to 50% in 1996, and a lowering of the average tariff rate by half from 80% in 1991 to 40% by 1996. Also, quantitative import restrictions on imports of capital and intermediate goods were removed, export restrictions on a number of goods were eliminated, and the FDI regime was relaxed.\(^{49}\)

India’s banking reforms differ from those in other developing countries in the policy toward public sector banks, which dominate the banking system. With a view to granting operational autonomy to such banks, public ownership in these banks was reduced by allowing them to raise capital from the equity market of up to 49% of paid-up capital. Competition is being fostered by permitting new private sector banks, and more liberal entry of branches of foreign banks, joint venture banks, and insurance companies.\(^{50}\) In essence, India’s NPL resolution strategy is one of decentralized and bank-based restructuring, with somewhat less emphasis on asset restructuring companies. The need to go public and raise capital has begun to challenge the current structure of government policy aimed at restricting concentration of share ownership, maintaining public dominance, and limiting foreign influence in the banking sector.

---

48 India’s foreign exchange reserves, which were only $975 million on 21 July 1991 (equivalent to less than 1 month of import cover) crossed $252 billion in March 2009.

49 However, imports of most other goods, mainly agricultural and consumer, were restricted, with BOP considerations being the reason for the continued quantitative restrictions on these goods. The most significant trade policy reform instituted in 2002 was the removal of quantitative restrictions on 714 import items. Restrictions, although, continue to be placed on a select number of medicines and drugs, explosives and ammunition, and jewelry for reasons of health, safety, and public morals.

50 The government announced its intention to reduce its equity share to 33.33%, but this is to be done while retaining government control. Improvements in the efficiency of the banking system will therefore depend on the ability to increase the efficiency of public sector banks.
Furthermore, the government has allowed private banks to expand equity by accessing capital from foreign investors. RBI is not formally independent of the government. However, it has considerable operational autonomy, which reflects the high priority that both the Ministry of Finance and RBI attach to controlling inflation. While the government’s automatic access to subsidized RBI financing has ended and the reliance on RBI financing by the central government has diminished over recent years, there are no formal limits on overall RBI lending to government.

India has done well in fostering the growth of the securities markets. In this, India is closer to the United Kingdom and the US, which have emphasized securities markets, and less like continental Europe and East Asia, which have emphasized banks. Judged by the number of transactions, the third- and the fifth-largest stock exchanges of the world are in India. The domestic equity market is much more developed in relative terms than is the banking sector or bond market (Lane and Schmukler 2006).

In the last 5 years, derivatives have been playing a very important role in the stock market. This is evident by the trading volume that they represent and the continually increasing number of scrips underlying both futures and options. In the PRC, stock index futures have not yet been launched, nor have options for providing more options and financial instruments for effective risk management. India’s experience of derivative trading is worth exploring further, and this will help foster more exchanges and interactions between financial experts in both countries.

India has built a world-class regulatory institution, SEBI, and in the past 15 years has implemented state-of-the-art market surveillance and safeguard mechanisms to ensure the safety and integrity of the markets, attracting huge portfolio investment each year. The stock exchanges are the first and primary regulator for the detection of market manipulation, price rigging, and other regulatory breaches. SEBI has an excellent track record since its establishment in 1992, and its regulatory standards are on par with that of those of developed countries. The record of Indian capital market regulators sets an example for the PRC and other emerging markets.

Based on India’s experience, the Government of the PRC can take suitable policy measures and provide guidelines to state–controlled commercial banks, foreign banks, and other financial institutions to reserve a ratio of their lending to SMEs and other growth industries. The PRC has already taken several steps in the development of a growth-industry stock market, but it still has a long way to go. The coordination between different regulatory authorities of the financial market is another area where it can learn from India. SEBI has had an excellent record of checking insider trading and market violations, although with limited success in punishing violators. Overall, India’s equity market has developed faster than the banking sector and other sources. The PRC capital market is following the trend set by India.

51 The process generally followed is that if the stock exchanges find any abnormal behavior in trading, then they immediately contact SEBI. In addition, SEBI, through the Integrated Surveillance Department, also initiates surveillance cases based on references received from other regulatory agencies, and also from investors and corporations (RBI Manual).
References


Bloomberg. www.bloomberg.com/


Indian Banks’ Association. www.indianbanksassociation.org/home/


Institute of Development and Research in Banking Technology. www.idrbt.com/


———. www.rbi.org.in/home.aspx


Appendix

Figure A.1: Share in Assets of Scheduled Commercial Banks in India, 2006

![Pie chart showing the share in assets of scheduled commercial banks in India, 2006.]

Source: Reserve Bank of India 2007.

Table A.1: Percent of All Scheduled Commercial Banks in Fiscal Year 2004

<table>
<thead>
<tr>
<th></th>
<th>Public Sector Banks</th>
<th>Private Sector Banks</th>
<th>Foreign Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>74.5</td>
<td>18.6</td>
<td>6.9</td>
</tr>
<tr>
<td>Deposits</td>
<td>77.9</td>
<td>17.0</td>
<td>5.1</td>
</tr>
<tr>
<td>Advances</td>
<td>73.2</td>
<td>19.8</td>
<td>7.0</td>
</tr>
<tr>
<td>Investments</td>
<td>78.0</td>
<td>16.8</td>
<td>5.2</td>
</tr>
<tr>
<td>Income</td>
<td>74.9</td>
<td>18.0</td>
<td>7.1</td>
</tr>
<tr>
<td>Net profit</td>
<td>74.3</td>
<td>15.6</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Source: Indian Credit Rating Agency 2005.
### Table A.2: Foreign Banks Entry in India

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure of foreign bank presence in India</td>
<td>Branches only</td>
<td>Branches or wholly-owned subsidiaries</td>
<td>Full national treatment, including IPO, subject to 26% of paid-in capital being held by resident Indians</td>
</tr>
<tr>
<td>Aggregate foreign direct investment limit in private banks</td>
<td>49%</td>
<td>74%</td>
<td>74%</td>
</tr>
<tr>
<td>Foreign voting rights limit</td>
<td>10%</td>
<td>Proposed amendment to allow voting rights to reflect ownership level</td>
<td></td>
</tr>
<tr>
<td>Branching limit per year</td>
<td>12</td>
<td>&gt;12</td>
<td>subject to RBI approval</td>
</tr>
</tbody>
</table>

**Unchanged**

- Five percent foreign investment limit in private banks by individual foreign banks.
- Ten percent foreign investment limit in private banks by foreign institutional investors or individual corporate entities.

IPO = initial public offering.

Source: Reserve Bank of India 2005.

### Figure A.2: Nonperforming Assets in India and the People’s Republic of China, 2005

**People's Republic of China**

<table>
<thead>
<tr>
<th>Year</th>
<th>NPLs as % of loan balancesa</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>31.1</td>
</tr>
<tr>
<td>2002</td>
<td>26.5</td>
</tr>
<tr>
<td>2003</td>
<td>20.4</td>
</tr>
<tr>
<td>2004</td>
<td>15.6</td>
</tr>
<tr>
<td>2005</td>
<td>10.1</td>
</tr>
</tbody>
</table>

**India**

<table>
<thead>
<tr>
<th>Year</th>
<th>NPLs as % of loan balancesb</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>10.4</td>
</tr>
<tr>
<td>2002</td>
<td>8.8</td>
</tr>
<tr>
<td>2003</td>
<td>7.2</td>
</tr>
<tr>
<td>2004</td>
<td>5.2</td>
</tr>
<tr>
<td>2005</td>
<td>3.5</td>
</tr>
</tbody>
</table>

*Represent $125 billion, or 6.5% of GDP; private analysts say true figure for overall bank system is 2–3 times higher.*

GDP = gross domestic product.

a For large commercial banks; excludes credit cooperatives.

b For scheduled commercial banks; data represent fiscal year ending March of the following year.

c Estimated.

Sources: Reserve Bank of India 2007; McKinsey Global Institute 2006.
Table A.3: Reserve Bank of India Guidelines for Risk Management in India’s Banking Industry

<table>
<thead>
<tr>
<th>Moody’s Ratings</th>
<th>ICRA</th>
<th>Risk Weights (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaa to Aa</td>
<td>LAAA</td>
<td>20</td>
</tr>
<tr>
<td>A</td>
<td>LAA</td>
<td>50</td>
</tr>
<tr>
<td>Baa to Ba</td>
<td>LA</td>
<td>100</td>
</tr>
<tr>
<td>B</td>
<td>LBBB and below</td>
<td>150</td>
</tr>
<tr>
<td>Unrated</td>
<td>Unrated</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Indian Credit Rating Agency 2005.

Table A.4: Growth and Inflation in India, A Historical Record (%)

<table>
<thead>
<tr>
<th>Period (Averages)</th>
<th>Gross Domestic Product Growth Rate</th>
<th>WPI Inflation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951/52 to 1959/60</td>
<td>3.6</td>
<td>1.2</td>
</tr>
<tr>
<td>1960/61 to 1969/70</td>
<td>4.0</td>
<td>6.4</td>
</tr>
<tr>
<td>1970/71 to 1979/80</td>
<td>2.9</td>
<td>9.0</td>
</tr>
<tr>
<td>1980/81 to 1990/91</td>
<td>5.6</td>
<td>8.2</td>
</tr>
<tr>
<td>1991/92 (Crisis Year)</td>
<td>1.4</td>
<td>13.7</td>
</tr>
<tr>
<td>1992/93 to 1999/00</td>
<td>6.3</td>
<td>7.2</td>
</tr>
<tr>
<td>2000/01 to 2006/07</td>
<td>6.9</td>
<td>5.1</td>
</tr>
</tbody>
</table>

WPI = wholesale price index.

Source: Reserve Bank of India 2007.

Figure A.3: Financial Depth: Financial Stock as Percentage of Gross Domestic Product, 2004

Figure A.4: Bank Deposits as Percentage of Financial Stocks


Figure A.5: Stock Exchange Indices, Shanghai versus Mumbai

India
- Healthy earnings growth drives increases in share price
- No major equity market scandal since 2002

People’s Republic of China
- Government restricts initial public offerings—almost exclusively state-owned companies
- Numerous insider-trading scandals

Index: December 29, 2000 = 100.
Sources: Bloomberg; McKinsey Global Institute analysis.
Table A.5: Market Capitalization of India’s Stock Market

<table>
<thead>
<tr>
<th>Year</th>
<th>Rs Crore</th>
<th>Growth Rate (%)</th>
<th>Gross Domestic Product (Rs crore)</th>
<th>Market Cap–Gross Domestic Product (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993/94</td>
<td>332,000</td>
<td></td>
<td>1,333,123</td>
<td>24.9</td>
</tr>
<tr>
<td>1994/95</td>
<td>434,783</td>
<td>31.0</td>
<td>1,421,831</td>
<td>30.6</td>
</tr>
<tr>
<td>1995/96</td>
<td>486,192</td>
<td>11.8</td>
<td>1,529,453</td>
<td>31.8</td>
</tr>
<tr>
<td>1996/97</td>
<td>477,425</td>
<td>(1.8)</td>
<td>1,645,037</td>
<td>29.0</td>
</tr>
<tr>
<td>1997/98</td>
<td>530,227</td>
<td>11.1</td>
<td>1,711,735</td>
<td>31.0</td>
</tr>
<tr>
<td>1998/99</td>
<td>502,116</td>
<td>(5.3)</td>
<td>1,817,752</td>
<td>27.6</td>
</tr>
<tr>
<td>1999/00</td>
<td>845,635</td>
<td>68.4</td>
<td>1,952,035</td>
<td>43.3</td>
</tr>
<tr>
<td>2000/01</td>
<td>727,539</td>
<td>(14.0)</td>
<td>2,030,867</td>
<td>35.8</td>
</tr>
<tr>
<td>2001/02</td>
<td>560,345</td>
<td>(23.0)</td>
<td>2,136,635</td>
<td>26.2</td>
</tr>
<tr>
<td>2002/03</td>
<td>661,260</td>
<td>18.0</td>
<td>2,216,260</td>
<td>29.8</td>
</tr>
<tr>
<td>2003/04</td>
<td>1,340,381</td>
<td>102.7</td>
<td>2,402,247</td>
<td>55.8</td>
</tr>
<tr>
<td>2004/05</td>
<td>1,774,726</td>
<td>32.4</td>
<td>2,602,235</td>
<td>68.2</td>
</tr>
<tr>
<td>2005/06</td>
<td>2,620,407</td>
<td>47.7</td>
<td>2,842,478</td>
<td>92.2</td>
</tr>
<tr>
<td>2006/07</td>
<td>3,815,114</td>
<td>45.6</td>
<td>3,108,360</td>
<td>122.7</td>
</tr>
</tbody>
</table>

( ) = negative growth rate, 1 crore = 10 million.
Source: Reserve Bank of India, various years.

Table A.6: Annual Turnover and Its Ratio over Gross Domestic Product (Rs crore)

<table>
<thead>
<tr>
<th>Year</th>
<th>Bombay Stock Exchange</th>
<th>National Stock Exchange</th>
<th>Total</th>
<th>Growth Rate (%)</th>
<th>Gross Domestic Product</th>
<th>Total–Gross Domestic Product (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>71,777</td>
<td>0</td>
<td>71,777</td>
<td></td>
<td>1,206,346</td>
<td>5.9</td>
</tr>
<tr>
<td>1992/93</td>
<td>45,696</td>
<td>0</td>
<td>45,696</td>
<td>(36.3)</td>
<td>1,272,457</td>
<td>3.6</td>
</tr>
<tr>
<td>1993/94</td>
<td>84,536</td>
<td>0</td>
<td>84,536</td>
<td>85.0</td>
<td>1,333,123</td>
<td>6.3</td>
</tr>
<tr>
<td>1994/95</td>
<td>67,749</td>
<td>1,806</td>
<td>69,555</td>
<td>(17.7)</td>
<td>1,421,831</td>
<td>4.9</td>
</tr>
<tr>
<td>1995/96</td>
<td>50,063</td>
<td>67,288</td>
<td>117,351</td>
<td>68.7</td>
<td>1,529,453</td>
<td>7.7</td>
</tr>
<tr>
<td>1996/97</td>
<td>124,284</td>
<td>294,503</td>
<td>418,787</td>
<td>256.9</td>
<td>1,645,037</td>
<td>25.5</td>
</tr>
<tr>
<td>1997/98</td>
<td>207,644</td>
<td>370,195</td>
<td>577,839</td>
<td>38.0</td>
<td>1,711,735</td>
<td>33.8</td>
</tr>
<tr>
<td>1998/99</td>
<td>311,999</td>
<td>414,474</td>
<td>726,473</td>
<td>25.7</td>
<td>1,817,752</td>
<td>40.0</td>
</tr>
<tr>
<td>1999/00</td>
<td>685,028</td>
<td>839,050</td>
<td>1,524,078</td>
<td>109.8</td>
<td>1,952,035</td>
<td>78.1</td>
</tr>
<tr>
<td>2000/01</td>
<td>1,000,032</td>
<td>1,339,510</td>
<td>2,339,542</td>
<td>53.5</td>
<td>2,030,867</td>
<td>115.2</td>
</tr>
<tr>
<td>2001/02</td>
<td>307,292</td>
<td>513,167</td>
<td>820,459</td>
<td>(64.9)</td>
<td>2,136,635</td>
<td>38.4</td>
</tr>
<tr>
<td>2002/03</td>
<td>314,073</td>
<td>617,988</td>
<td>932,061</td>
<td>13.6</td>
<td>2,216,260</td>
<td>42.1</td>
</tr>
<tr>
<td>2003/04</td>
<td>502,620</td>
<td>1,099,535</td>
<td>1,602,155</td>
<td>71.9</td>
<td>2,402,247</td>
<td>66.7</td>
</tr>
<tr>
<td>2004/05</td>
<td>518,717</td>
<td>1,140,071</td>
<td>1,658,788</td>
<td>3.5</td>
<td>2,602,235</td>
<td>63.7</td>
</tr>
<tr>
<td>2005/06</td>
<td>816,073</td>
<td>1,569,556</td>
<td>2,385,629</td>
<td>43.8</td>
<td>2,842,478</td>
<td>83.9</td>
</tr>
<tr>
<td>2006/07</td>
<td>956,185</td>
<td>1,945,285</td>
<td>2,901,470</td>
<td>21.6</td>
<td>3,108,360</td>
<td>93.3</td>
</tr>
</tbody>
</table>

( ) = negative growth rate, 1 crore = 10 million.
Source: Reserve Bank of India, various years.
### Table A.7: Capital Raised in 2004–2005 and 2005–2006

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Amount (Rs crore)</td>
<td>No.</td>
</tr>
<tr>
<td>Public issues, of which</td>
<td>34</td>
<td>24,640</td>
<td>103</td>
</tr>
<tr>
<td>IPOs</td>
<td>23</td>
<td>12,382 (R)</td>
<td>79</td>
</tr>
<tr>
<td>FPOs</td>
<td>11</td>
<td>12,258 (R)</td>
<td>24</td>
</tr>
<tr>
<td>Rights issues</td>
<td>26</td>
<td>3,616</td>
<td>36</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60</strong></td>
<td><strong>28,256</strong></td>
<td><strong>139</strong></td>
</tr>
</tbody>
</table>

**Memo Item:**

*Offer for sale*

3 | 3,200 | 3 | 278 | 11.32 | 1.01 |

1 crore = 10 million, FPO = follow-on public offer, IPO = initial public offering, R = revised.

Source: Reserve Bank of India 2005.

---

### Figure A.6: Share of Private and Public Sectors in the Total Capital Realized

Source: Securities and Exchange Board of India 2006.
Figure A.7: Origin of Foreign Institutional Investors Registered with the Securities and Exchange Board of India (Number of investors)

- Luxembourg (64)
- Singapore (47)
- Hong Kong, China (30)
- Canada (26)
- Australia (23)
- Ireland (23)
- Netherlands (23)
- Mauritius (22)
- Switzerland (19)
- France (17)
- United States (342)
- United Kingdom (148)
- Others (87)

Source: Securities and Exchange Board of India 2006.

Figure A.8: Indian Rupee–Dollar Exchange Rate between 2 January 1991 and March 2008

Source: Bloomberg.
Figure A.9: Derivatives Trading in India

<table>
<thead>
<tr>
<th>Product Type</th>
<th>2004/05</th>
<th>2005/06</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single stock futures</td>
<td>57.9</td>
<td>57.9</td>
</tr>
<tr>
<td>Index futures</td>
<td>30.7</td>
<td>31.4</td>
</tr>
<tr>
<td>Index options</td>
<td>4.8</td>
<td>7.0</td>
</tr>
<tr>
<td>Stock options</td>
<td>6.6</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Source: Securities and Exchange Board of India 2006.
Since the colonial era began in India, several large entrepreneurial enterprises have taken root and flourished on the subcontinent, the most prominent being Tata Group and Aditya Birla Group. Despite the colonial government’s repressive attitude toward entrepreneurs, these family-owned companies achieved rapid growth during and after World War I. When India gained independence from the United Kingdom in 1947, entrepreneurs were already established as major players in India’s economy.

Beginning in the 1950s, the Government of India used policies, including those related to licenses and small-scale industry, to pursue a mixed economy model that limited the development of major private enterprises. These and other regulations protected domestic companies from international competition, but they also limited their growth. When a wave of socialism engulfed India during the late 1960s and 1970s, government control became more restrictive.

The government’s attitude shifted during the 1980s, when India’s gross national product almost doubled, as entrepreneurs were finally recognized for their positive contribution to economic growth and development. However, this shifting attitude did not result in many concessions, and the restrictive economic policies eased slowly. Although most of India’s information technology companies were created during this period and Rajiv Gandhi’s government had a clear vision for the sector, entrepreneurial growth remained domestic and faced many difficulties in dealing with international clients.

Government policy shifted significantly during liberalization and globalization period that began in 1991. Watershed reforms announced in Parliament by Manmohan Singh—the then-finance minister for the P. V. Narasimha Rao government and currently prime minister—completely altered the environment for Indian entrepreneurs. Liberalization provided favorable external conditions for developing large private enterprises, while also generating competition.

Today, four ethnic Indian entrepreneurs appear in the 2008 Forbes list of the top 10 billionaires. Moreover, private enterprises have provided the foundation for India’s economic growth.

---

1. Professor at the School of International Studies, Peking University.
2. For a detailed explanation of the license policy, see Gurcharan (2000).
3. The government reserved more than 800 goods for production by small-scale firms.
4. The government nationalized many banks; Foreign Exchange Regulation Act regulated foreign exchange; and several other mechanisms such as Monopolistic and Restrictive Trade Practices Act clearly halted the growth of native entrepreneurs.
5. Among the 47 Indians included in the 2008 Forbes list (19 more than in 2007) are Mukesh Ambani (5th) and Anil Ambani (6th) of Reliance Industries, Azim Premji (60th) of Wipro, Kumar Birla (76th) of Aditya Birla Group, Shiv Nadar (277th) of Hindustan Computer Limited (HCL) Technologies, and N. R. Narayana Murthy (843rd) of Infosys Technologies.
economic growth and integration into the global economy. Several major private enterprises outpace the world in production and sales. On many levels, India has reached its goal of becoming a global center for manufacturing, trade, and service.

Since 2000, major enterprises have greatly expanded their foreign investments through various mergers and acquisitions. Within the past 5 years, the value of purchasing Indian companies overseas reached $20 billion (India Today 2007). More importantly, it is no longer unusual to encounter an Indian chief executive officer at multinational companies like PepsiCo (Indra Nooyi) and Citigroup (Vikram Pandit). Indeed, top management positions at many Fortune 500 companies are occupied by Indian nationals.

This paper explains entrepreneurship, describes its embodiment in outstanding enterprises, presents four case studies, and summarizes the lessons of India's experience for counterparts in the People's Republic of China (PRC).

Entrepreneurship Defined

Entrepreneurship is the soul of enterprise and the driving force behind all economic activities. Its pillars support the economic health of all societies. Although a recent article defined entrepreneurship as the fourth factor of production that leads to the discovery of new frontiers and wide-sweeping economic growth (Goel et al. 2007), entrepreneurship lacked a unified definition until recently.

In early 1891, W. D. Bygrave and C. W. Hofer described the entrepreneurial process as “involving all the functions, activities, and actions associated with the perceiving of opportunism and the creation of organizations to pursue them” (Prasad 2003, ii). Joseph Schumpeter's modern definition perceived entrepreneurship as “the carrying out of new combinations we call 'enterprise'... the individuals whose function it is to carry them out we call 'entrepreneurs’” (Schumpeter 1974, 66). Schumpeter connected entrepreneurs with the creation of five basic functions: (i) introducing a new product, (ii) developing a new method of production, (iii) opening a new market, (iv) conquering a new source of supply, and (v) developing a new organizational framework for industry. H. K. Secretan suggested that the entrepreneur integrates risk, innovation, leadership art, skill, and craftsmanship and then gathers a team for operation (Kao 2003, 5).

---

6 According to 2007 data, private enterprises in India contributed almost 80% of total gross domestic product.
7 For instance, Reliance Industries is the largest producer of polyester fiber and yarn (www.ril.com). Aditya Birla Group is the world's leading producer of viscose staple fiber (www.adityabirla.com). Mahindra & Mahindra is among the world's five largest tractor manufacturers (www.mahindra.com). Bajaj is the fourth largest manufacturer of motorcycles and tricycles in the world (www.bajajauto.com). Ranbaxy Laboratories Limited operates the largest pharmaceutical factory in India, is among the largest generic companies worldwide, and has entered into 23 of the 25 largest medicine markets worldwide (www.ranbaxy.com). Its sales volume for 2005–2006 was $1.339 billion.
8 Tata Group, with 21 purchases, accounts for two-thirds of the value, while Wipro has completed six purchases abroad. In January 2007, Tata purchased Corus Group, an iron and steel enterprise for about $12.1 billion. In May 2007, Aditya Birla Group purchased Novelis Inc. for about $6 billion, making it the largest aluminum corporation in the world.
Jeffrey Timmon, a professor at Harvard Business School, summarized entrepreneurship as (i) commitment and determination to overcome obstacles and compensate for others’ weaknesses; (ii) leadership, i.e., successful entrepreneurs are self-starters with an internal locus of control who can transmit vision and passion to the management team and other employees; (iii) conducted by individuals who are market-driven and obsessed with value creation and enhancement; (iv) high tolerance for risk and uncertainty, thriving on chaos and able to resolve problems and integrate solutions; (v) adapting to change and solving problems creatively; and (vi) motivation to excel, with a high need for achievement (Prasad 2003, iii).

Peter Drucker judged entrepreneurship to be a practice—neither a state of being nor characterized by making plans that are not acted upon. According to Drucker, entrepreneurship begins with action (creation of a new organization); when individuals create a new organization, they enter the entrepreneurship paradigm. Drucker said the “entrepreneur considers change as rules” and “always pursues change, responds actively, and utilizes it [change] as an opportunity” (Prasad 2003, 4).

The Global Entrepreneurship Monitor defined entrepreneurship as “any attempt at new business or new venture creation, such as self-employment, a new organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business” (Prasad 2003, 5). Allan A. Gibb and J. A. Hornaday summarized the entrepreneur’s basic traits; Gibb listed 18 characteristics and Hornaday listed nine, including leadership, originality, enterprise, adventure, self-discipline, and diligence. For both, entrepreneurs focus on determining business opportunities, integrating resources effectively, finding new methods, and creating new organizational frameworks (Kao 2003).

This paper defines entrepreneurship as an individual's action in initiating business and commercial activities or participating in strategic decisions that lead to a new enterprise, including (i) the impulse and ability for independence; (ii) an organization’s ability to grasp an opportunity to produce new value or propel economic success by introducing innovation or invention and perfecting the current market; (iii) ability to rebuild or create a new market, thus converting commercial awareness into success; (iv) ability to integrate innovation or invention into improved management; and (v) ability to develop adaptation and optimization. Entrepreneurship also goes beyond daily management of a business, involving commercial confidence and strategies.

**Outstanding Entrepreneurship in India**

In India, several outstanding entrepreneurs have established and expanded private industry. All have displayed the following qualities and actions.

**Strong Sense of Mission, Steadfast Values, Self-Confidence, and Determined Actions**

Remarkable Indian entrepreneurs share a strong sense of mission. Rather than focusing solely on generating personal income, they aim to create wealth for the country and society. Jamsetji Tata always planned to help develop industry and science in India, even during his initial days in industry, 100 years ago. When N. R. Narayana
Murthy founded Infosys Technologies, he sought “a bright future for ourselves, for India, and perhaps, we dreamed even for the world” (speech 22 May 2001). Likewise, Azim Premji was determined to build Wipro into a professional enterprise of which India could be proud.

Outstanding entrepreneurs always set large goals and explored ways to achieve them. They also develop values for their enterprises and incorporate into them a code of conduct to guide their employees. Despite varied expressions and emphasis, these codes of conduct universally address integrity, honesty, trust, equality, responsibility, understanding, excellence, and unity.

Self-esteem and self-confidence allow them to trust their own wisdom and ability to achieve success. Conscious of their positive attributes, they concentrate their efforts in fields where they can succeed. All outstanding entrepreneurs are activists and practical people who follow their decisions with actions. They never lose sight of their goals, and they overcome difficulties.

**Innovation**

Our study determined that entrepreneurs place primary importance on innovation. Because entrepreneurs are perceptive and predictive, they discover and grasp new opportunities. By perceiving change as a fluid phenomenon and applying their own ideas, they create new values, products, and services that allow them to reach top levels of global competition. Thus, entrepreneurs prepare for danger in times of safety, do not settle for past achievements, and focus on the next step of action. They discover or create innovation to exploit opportunities, then grasp that opportunity decisively, take risks, and respond appropriately.

Dhirubhai Ambani, the founder of Reliance Industries Limited, created a massive industrial conglomerate in his lifetime. He began his business career in trading with a few thousand dollars investment in 1959. His business empire—the Reliance Industries had $12.2 billion net revenue by the time of his death in 2002. His focus was on providing shareholder value to India’s multitude of small retail investors through the relentless pursuit of growth and profits through diversification, backward integration and creation of economically viable large scale industrial units (Economist, 11 July 2002). The company had 3.5 million shareholders.

Azim Premji, the chairman of Wipro, stressed that “innovation is Wipro—Wipro is innovation” (www.wipro.com). The company strives to challenge limits, not only by realizing potential but also by expanding it. Innovation is omnipresent, and the company constantly seeks to better its own performance. When government policy restricted foreign capital, causing International Business Machines Corporation (IBM) to withdraw from India in the late 1970s, Premji entered the domestic computer market and propelled Wipro into becoming a leading information technology company.

Established originally to provide consulting services to Tata Group companies, Tata Consultancy Services employed only 20 individuals in 1968. General manager F. C. Kohli soon determined that it should focus on business beyond Tata Group, so it entered the United States market. In the late 1980s, he created a new offshore operation method, changing from “body shopping” to “business process outsourcing,” i.e., bringing overseas projects to India for work. Concurrently, Tata Consultancy Services developed new software programs, most notably for financial services.
In 1976, Shiv Nadar and five colleagues founded Hindustan Computer Limited (HCL) Technologies. Two years later, HCL Technologies developed India’s first micro-computer, establishing the country’s computer industry. To keep track of emerging technologies and to hone skills and talent in new areas, Nadar initiated the idea of “technology cradles” at the company’s technology centers where new, high-potential, and cutting-edge technologies are incubated and developed. Twenty years later, Nadar commenced operations in the United States and developed a strategy to take HCL Technologies global. Now 30 years old, HCL Technologies has indeed grown into a global enterprise that employs 45,000 professionals and generates annual revenue of $4 billion.

Mahindra & Mahindra Limited was founded by brothers J. C. and K. C. Mahindra in 1945, after K. C. met Barney Roos, inventor of the ubiquitous Jeep used in World War II, during a visit to the United States (www.mahindra.com). The brothers purchased a franchise from Willys–Overland, a famous American Jeep producer, which allowed them to import, assemble, and sell Jeep parts in India. This strategy allowed Mahindra & Mahindra to sell various types of vehicles to consumers in rural areas, suburbs, and large cities, as well as to the government’s defense department. In 2002, the company developed a world-class, luxurious sports utility vehicle suitable for bad road conditions but that still performs well and economically.

Hero Group, a bicycle and motorcycle manufacturer, maintains a rapid pace in innovation and growth. After becoming India’s largest bicycle producer in 1975, Hero targeted the Western market and imported modern equipment from Europe and Taipei, China; updated its technologies; and manufactured high-standard products to enter markets in developed countries. In 1984, Hero Honda Motors Limited was established in a joint venture with Honda Motor Company Limited of Japan to manufacture motorcycles (www.herohonda.com). That joint venture quickly became the largest manufacturer of motorcycles in the world.

Pursuit of Excellence

Preeminent entrepreneurs in India never quit after they made the decision to start new undertakings, and they usually were able to convert obstacles into opportunities. When a company faces a critical situation, entrepreneurs persist until they gain an advantageous position. Entrepreneurs resist adversity, and they face difficulties with courage and dignity, detect challenges and opportunities alike, and inspire their employees to persevere as well. With deep-rooted confidence, entrepreneurs transform their innate talents into high-quality, low-cost products and services, delivering good value and lower cost to consumers. Excellence becomes an instinctive aspiration, and the pursuit of excellence becomes their preferred mode of behavior.

J. R. D. Tata, a former chairman of Tata Group, believed that excellence requires a goal of perfection and that achieving perfection requires strict attention to detail. For Ratan Tata, the current chairman of Tata Group, quality means that consumers not only purchase Tata products but also choose them over and over again. He designed the Tata Business Excellence Model to mirror quality standards in the United States, enabling Tata Group companies to reach the highest international product standards (See the case study on the Tatas, page 395).
International Perspective

In India, entrepreneurs maintain an international perspective, stressing adoption of the most advanced technologies and equipment, absorbing best talent in the world, and following modern systems to keep pace and occasionally to surge ahead of international competition. Faced with an era of globalization, entrepreneurs realize the importance of creating an international presence.

The leaders of Tata Group developed the following criteria for globalization.

- The company must focus on international trade if it wants to be powerful in domestic industries.
- Expansion requires not only the ability to manufacture world-class, competitive, and quality products but also finding a continuously growing overseas market.
- A global company must maintain a strong international position; have worldwide assets, capacity, and brands; and positively respond to an unexpected attack or even a periodic economic recession.
- A global company must be internationally competitive, have worldwide influence, and be recognized by the global market. The company must draw its assets and employees from all over the world. Global consumers must demand its products, and global investors must buy its shares.
- A global company must obtain its raw materials, funds, and talents from the best and most competitive sources, and gain customers and markets in all areas to deliver superior value to its customers, suppliers, and business partners.
- After entering markets in other countries or areas, the company must accept the local culture, merge into society, and contribute to local economic development (www.tata.com).

India’s enterprises are influenced by those in developed countries, and they seek cooperation to keep pace with advanced technologies and to enter the world market. International cooperation generally follows a pattern: (i) importing technology, equipment, and talent during the company’s initial development stage; (ii) exporting products and launching joint ventures when the company gains strength; and (iii) pressing their advantage by expanding beyond the homeland and establishing sole proprietorships and joint ventures to cooperate in technology and sales. Accordingly, recent activity in India has trended toward international mergers and acquisitions.

When Jamsetji Tata opened a modern textile mill over 100 years ago, he recruited engineers, machines, technologies, and various textile inventions from the United Kingdom. When he entered the steel industry, experts from the United States guided the entire process—from exploration of iron ore and coal mines to site selection and construction. When the steel plant began production, the company imported new technologies and processes from the international steel industry, becoming the most technologically efficient steel enterprise in India. Several years ago, Tata Group completed its four-phase, 20-year modernization and expansion program by importing the most advanced technologies and equipment from around the world, propelling it from a small producer of carbon steel into the largest specialized steel enterprise in India.
Upon entering the automobile manufacturing industry in 1954, Tata Group reached a cooperation agreement with Daimler–Benz in Germany. In recent decades, commercial vehicles (including trucks and buses) produced by Tata have dominated the market in India and were exported to some developing countries. During the 1990s, Tata Group imported technologies from leading automotive companies in Germany, Japan, and the United States and began manufacturing sedans. In 1998, Tata Group independently produced the Tata Indica hatchback.

After launching a joint venture with International Harvester Company in 1963 for equipment and technology, Mahindra & Mahindra developed the tractor B-275 on its own. It founded Mahindra USA, a sole proprietorship, in 1994 and built three assembly plants. Today, hundreds of distributors sell Mahindra products in the United States.

Technological support from developed countries played a pivotal role in Wipro’s business expansion. Wipro imported technologies from Switzerland when it was still a hydraulic cylinder producer and later forged a strategic relationship with enterprises in the United States. When Wipro entered the information technology industry in 1977, it cooperated with international giants such as Apple Inc.; IBM; Intel Corporation; Seiko Epson Corporation; Sun Microsystems, Inc.; and Tandem Computers.

Outstanding entrepreneurs promote international standards for company governance and quality management. Ratan Tata designed the Tata Business Excellence Model to mirror the Malcolm Baldrige National Quality Award. Implemented for almost a decade, some Tata Group companies have attained the 500 score. Other companies, including Wipro, have developed similar models of quality management.

Global Orientation

Tata Consultancy Services generates 90% of its income from overseas businesses. Infosys Technologies derived more than half of its $2 billion revenue in 2006 from the United States and about a quarter from Europe. Wipro earned 60% of its 2006–2007 sales revenue in the United States and 29% in Europe. Half of Aditya Birla Group’s income flows from overseas operations. HCL Technologies, with its annual revenue approaching $4 billion, has over 500 clients around the world and conducts business in 17 countries. In 2005–2006, 18 pharmaceutical companies in India, including Ranbaxy Laboratories Limited, operated on a global scale; Ranbaxy’s primary overseas market is North America. Reliance Industries exports products worth nearly $7 billion to over 100 countries each year.

Outstanding entrepreneurs constantly update marketing strategies, making the best possible use of techniques and also developing new concepts and strategies to pioneer global markets. For example, Infosys Technologies sells its products on the basis of value rather than cost, while providing an image of a local company. Kumar Birla, the chairman of Aditya Birla Group, believes that the greatest challenge to the globalization of India’s enterprises comes from culture, i.e., that global expansion requires not only geographical reach but also a mindset. Therefore, entrepreneurs must develop a special capacity for transcending language and culture.

Strategic considerations for overseas mergers and acquisitions include eliminating competition; efficiently increasing market share; and acquiring tangible assets, talents, and technological resources—narrowing the gap between a company’s technology and
advanced international technologies quickly and accelerating the achievement of strategic targets. Several Tata Group companies have completed more than 20 overseas acquisitions in recent years. Discussing the decision to buy Novelis Inc., an aluminum firm, Kumar Birla said he was “attracted by its scale and leading technologies. Or else, we [would] take 5 years to reach Novelis’s level, which Birla cannot afford” (www.adityabirla.com).

Wipro employs workers from over 40 countries, and its 53 research centers are located throughout the world. Aditya Birla Group owns 85 companies and maintains service centers in 20 countries, including developed countries like France, Germany, Japan, United Kingdom, and United States as well as some developing countries. Infosys Technologies operates offices or research centers in 20 countries and areas throughout the Americas, Asia–Pacific, and Europe. Additionally, Tata Consultancy Services has established research and development centers in 10 countries.

Infosys and Wipro joined NASDAQ⁹ in 1999, and Dr. Reddy's Laboratories, India’s second-largest pharmaceutical company, joined the New York Stock Exchange in 2001. As early as the mid-1990s, Reliance Industries raised funds through global depository receipts and later issued euro convertible bonds in Europe and the first Indian company to issue 50–100 year bonds in the United States.

**Stellar Management**

Typically established by families, large private enterprises are deeply influenced by the modern enterprise system of industrial nations, and they generally follow this system even though family members occupy leadership positions. Such companies are usually also operated by a team of professional managers. In 2000, the government modified the Company Law in accordance with international standards to require more stringent restriction of boards of directors and higher disclosure standards that encourage improvements to management systems.

Companies in India demonstrate different levels of management. In 2005, Dr. Reddy’s Laboratories compared 13 aspects of its own company governance with requirements to be listed on the New York Stock Exchange.

A good management system allows the entrepreneur to

- infuse his or her ideas and enthusiasm into the management team and employees;
- adhere to his or her values, targets, and responsibilities;
- integrate assets efficiently and ensure that human, material, and financial resources adapt to different clients and markets, creating sustained success;
- implement scientific management and processes necessary to compete internationally; and
- encourage initiative among the management team to ensure execution of the systems and effective operation of the company.

---

⁹ National Association of Securities Dealers Automated Quotations, a stock exchange in New York City.
**Emphasize Human Resources**

Toward human resources, preeminent entrepreneurs typically

- create a favorable atmosphere that nurtures the potential of all employees;
- accept employees as individuals, demonstrate concern in material and mental matters, share information and profits, relate the company’s development to the interests and development of its employees, and create a stable workforce;
- clearly delegate duties and tasks to allow employees to use their own initiative and potential; develop and utilize human resources through recommendations, nurturing, and promotions; create a sense of belonging; and connect individual development to company growth; and
- recruit the best candidates, and train them to create strong teams and elite leadership.

J. R. D. Tata believed that Tata Group companies should recruit the best and most dedicated personnel. Many senior managers and technical experts contribute their entire lives to the Tata Group, becoming an indivisible part of the company. Wipro operates by the principle that “we must employ the best and invest in them” (www.wipro.com). The company sends recruiters to top universities to select outstanding students. Wipro also recruits from within when undertaking a new enterprise, and only outsources if there are no suitable persons within the company. Infosys Technologies identifies the best learners among skilled applicants, because they generally are “modest, often to the point of shyness, and [have] a deep respect and hunger for knowledge—which the company [views] as the key to personal progress” (Ghoshal 2001, 629).

All extraordinary enterprises emphasize employee training, improved performance, and promotion opportunities. They offer a full range of training for various employees (e.g., newly hired, in-service workers, candidates for promotion, senior managers, and middle management). They maintain world-class training methods and curriculum arrangements, and they hire professors from world-renowned business schools to deliver courses.

Training programs at Reliance Industries reflect the company’s belief that thoughts, behavior, and management should mirror the world’s best training methods. They instill their employees with the belief that success at Reliance equals success in any international company. The Indian Institutes of Management and Indian Institutes of Technology implement the company’s training programs, and Reliance hires consultants (e.g., Hewitt Associates) to train its senior managers.

**Benevolent Leadership**

Extraordinary entrepreneurs adopt policies toward their employees that combine strictness with lenience. Competition among enterprises has intensified, and the concept of human rights has finally taken root in India. Ensuring the quality of employees and utilizing them effectively challenges entrepreneurs more than ever. They need excellent workers to guarantee good performance, and they also have to protect their employees’ dignity and rights.
Tata Group’s strict rules encourage and discipline employee behavior, and its companies offered generous salaries and benefits before they were required by law (Lala 2004, 284–285). Tata’s code of conduct includes stringent requirements for services, skills, ethics, and values. To ensure practical implementation, managers and workers must sign this code, and designated employees monitor compliance. The companies conduct a random sampling of employees’ ethical performance yearly, and a judicial process discloses wrong behavior. Good behavior is rewarded with salary increases and promotions.

Although Azim Premji’s requirements for Wipro employees seem strict, he respects them and promotes their individuality. Wipro stresses trust and encourages its employees to create “synergistic” efficiency through joint efforts. Wipro’s culture is open and sharing, and the company encourages employees to discuss management values, business plans, strategies, and company policies. Wipro also offers rich material rewards; it was the first company in India to allow its employees to purchase company stock. Infosys Technologies encourages its employees to argue, have different viewpoints, and offer criticism.

Social Responsibility

Extraordinary entrepreneurs believe that the seeds of wealth lie in the company’s assets. Their pursuit of wealth encourages economic growth, acquires freedom and capital, and creates new wealth and better values for society. They pay taxes and participate in worthy causes because they feel an obligation to share their wealth. Such attitudes reflect an international trend toward corporate responsibility.

Most entrepreneurs in India have invested part of their profits in social causes, including culture, education, sanitation, health care, social facilities, poverty reduction, and environmental protection. An interview with over 30 preeminent Indian leaders, conducted by the Hay Group in 2005, showed that they have a highly altruistic business philosophy.10

As early as the 1940s, G. D. Birla indicated that the wealth one generates should benefit multiple stakeholders. Aditya Birla Group invests part of its profits outside of its business to improve society, notably health care, education, and infrastructure. The group also developed a concept of sustainable livelihood, channeling resources to ensure that people can sustain themselves. In 1995, Kumar Birla further institutionalized the concept of triple bottomline accountability (i.e., economic success, environmental responsibility, and social commitment). The Aditya Birla Centre for Community Initiatives and Rural Development was established to provide strategic direction and thrust areas for their work ensuring performance management. All Aditya Birla companies have rural development cells that implement various sustainable livelihood programs, and all are subject to internal performance assessment and external auditing. In 2000, the Aditya Birla Group was recognized as the “Indian Corporate Citizen” by the Indian Business Leader Awards.

Reliance Industries views being a corporate citizen as a core value. The company builds public infrastructure; ensures environmental safety; implements energy con-

10 See Spencer et al. (2007).
servation; and provides local communities with drinking water, health care, schools, scholarships, and hospitals. The Reliance Anil Dhirubhai Ambani Group accepts social responsibility not as an occasional act of charity or that one-time token financial contribution to the local school, hospital or environmental NGO but as an ongoing year-round commitment... integrated into the very core of our business objectives and strategy (www.relianceadagroup.com).

Case Studies: Four Large Indian Private Companies

India has many outstanding entrepreneurs who embody true entrepreneurship. This report focuses on four: (i) the Tatas (Tata Group), (ii) N. R. Narayana Murthy (Infosys Technologies), (iii) Dhirubhai Ambani (Reliance Industries Limited), and (iv) Azim Premji (Wipro).

The Tatas

The Tata family initiated India’s modern textile industry between 1860 and 1870. Spanning four generations, Tata Group leadership encompasses Jamsetji Tata (1839–1904), the group’s founder, who has been praised as the “Father of Indian Industry”; his son, Sir Dorabji Tata (1859–1932); J. R. D. Tata (1904–1993); and Ratan Tata (1937–) who is currently the chairman of the Tata group (of Tata Industries since 1981, of Tata Sons since 1991, and various other Tata companies).

In the early 20th century, the Tata family entered the iron and steel industries, and soon spread their businesses into hotels, power generation, cement, metal, chemicals, machinery, banking, insurance, investment, and aviation. Before India declared its independence from the United Kingdom, the Tatas owned more than 20 companies, and the Tata Group was the largest enterprise group in India. After India’s independence, government policies nationalized several industries and limited the development of heavy industry to the public sector. Because Tata Group responded by diversifying and strengthening their existing enterprises, however, it retained its first- or second-place ranking among enterprise groups in India. When the government introduced liberalization, privatization, and globalization reforms in 1991, Tata Group invoked a series of strategic measures—including recombination, improved operation, and strengthened management—that continued its record of success.

Currently, the Tatas’ business interests focus mainly on production and operation in seven fields: information technology and telecommunications, machinery, iron and steel, service, energy, consumables, and chemicals. Tata Group owns 98 companies and employs 289,500 people in more than 80 countries. In 2006–2007, its revenue was $28.9 billion (around 2.5% of India’s gross domestic product), and its profit was $2.8 billion. It paid taxes and duties equivalent to 2.5% of India’s public purse. Its overseas revenue was $6.7 billion, which amounted to 5.1% of India’s export value. Tata Group has 27 listed companies, and in early 2008, its market value was $66.9 billion, with shareholders numbering more than 2.9 million. In November 2006, Tata Group was ranked 20th on the Forbes list of the world’s most reputable large companies. The Tatas’ embodiment of entrepreneurship includes the following traits.
Perseverance and Indomitability
In the late 1860s, Jamsetji aspired to initiate an iron and steel industry in India, a goal finally achieved when his son Dorabji opened a steel mill in 1907. Although faced with challenges imposed by the colonial government, a world economic crisis, and modernization, in the early days following India’s independence, Tata Steel’s steel output reached more than 1 million tons.
Tata entered the chemical industry during the 1930s, when the formula for soda ash was closely guarded by a cartel of six international companies. Tata met this challenge by cracking the code through its own technical experts. In 1962, it made a significant technical breakthrough by using treated sea water instead of fresh water.

Entrepreneurial Spirit and Dedication to India
Jamsetji was devoted to modern industry, abandoning his business and affluent lifestyle in Mumbai (formerly Bombay) and moving his family to Nagpur to establish a larger textile mill. He was determined that India should have its own iron and steel industry, electricity supply, technology, and education—necessities for developing India’s industry. After succeeding in the textile industry, he entered each of those fields, contributed Rs3.0 million to help establish the Indian Institute of Science in Bangalore, and donated Rs2.5 million to establish scholarships. He also opened India’s first grand hotel, the Taj Mahal Palace Hotel in Mumbai.
Dorabji continued Jamsetji’s policies and accomplished his father’s unfulfilled wishes of constructing the Indian Institute of Science, an iron and steel plant, and three water power stations. When the steel mill was close to bankruptcy in 1924, Dorabji mortgaged his personal assets (Rs10 million) and his wife’s jewelry to the Imperial Bank of India to help it through the crisis. J. R. D. continued to develop industry and science, and when India declared its independence, he established industries encompassing metals, chemicals, machinery, automobiles, radio, electrons, and aviation. He also built the Tata Institute of Social Sciences, Tata Memorial Centre (a hospital that focuses on cancer prevention and treatment), and Tata Institute of Fundamental Research.

Keeping Pace
Ratan observed that a company or business that remains static is a business that will die. A company that constantly changes and accepts that there are better ways to do things than the way they are done today is the company that will survive in the global market that we face (Lala 2004, 209).
During the colonial era, the Tatas developed appropriate strategies—waiting and maneuvering for any opportunity to develop their companies and survive—to counter the colonial government’s policies and the changing world situation. After India’s independence, the government pushed an import-substitution strategy for economic development and implemented an industrial policy that limited development of heavy industry to the public sector. In response, J. R. D. entered fields that were open to development by the private sector, e.g., machine tools, tires, farm chemicals, food processing, tea, and cosmetics.
Today, India competes globally so its products must be of good quality and meet customers’ requirements. Therefore, Ratan initiated a series of important reforms, including
(i) establishing a retirement age for senior managers;
(ii) developing a new logo for compliance by all Tata Group companies to the Tata brand equity scheme and business promotion;
(iii) introducing the Tata Business Excellence Model that defined employee behavior criteria;
(iv) restructuring (i.e., withdrawing from some industries that lacked competitive power and entering fields demanded by contemporary society) to strengthen competitive power, increase shareholder gains, and better prepare Tata Group for unexpected changes;
(v) strengthening authority by increasing Tata Group’s ownership share of its companies; and
(vi) recognizing globalization as an important development strategy (Lala 2004, 266–272).

Ratan believed that “the challenge for India is how to be provided with a competitive power in the world [and that] we actually need to change ourselves to make progress with the time, and do our best to adapt us for the environment” (www.tata.com). Since 2002, Ratan has developed a globalization strategy that extends Tata Group’s business interests beyond India’s borders. Since 2000, Tata Group has acquired more than 20 overseas companies involving tea, automobiles, steel, information technology, telecommunications, chemicals, and hotels.

Persisting in Quality
Jamsetji was determined to use Tata Group capital to maintain and update machinery, keeping them in the best working order. He knew that paying attention to details avoids future difficulties and increases the likelihood of success. Therefore, excellence naturally became the ultimate goal of all Tata Group activities. The Tata Quality Management Section was established to mentor Tata Group companies through high-quality consulting and training.

Seeing Employees as a Resource
Tata Group has always highly valued its employees. Each generation has not only sought the best managers and technicians but also encouraged them to seek further education and promotions. In addition to employee training, the Tatas developed a good work environment and pay their employees well.

J. R. D. routinely engaged expert managers, technicians, economists, and lawyers, and allowed them to function freely. Ratan carried J. R. D.’s commitment even further by organizing the five-person Group Executive Office as the top policy-making body of the Tata Group, establishing a group company center to provide strategic direction, and designing the 15-person Tata Quality Management Section to improve quality. He also replaced family authority with a systematic leadership and management model. He has expressed that after he retires, the chairperson may not be a Tata and may not be from India. Ratan also enables employees to grow along with the enterprise, further strengthening loyalty. In fact, most employees have worked for Tata Group for several generations, and the enterprise has only gained from their dedication. Competition for human talent is intense, and securing good employees is becoming increasingly difficult. One innovative approach involved selling the group’s tea plantation in South India to its workers, who now share directly in its profits.
Profiting from and Returning to the People

Tata Group is committed to public welfare, and several generations of Tatas have initiated cultural education, developed science, established medical health services, aided agricultural production, served the poor, and protected the environment. Jamsetji established a charitable trust fund and participated in many of its activities. Dorabji endowed the Tata Institute of Social Sciences in 1936 and Tata Memorial Centre in 1941, and built the Tata Institute of Fundamental Research in 1945. He also established a special fund benefiting leucocytosis research and contributed to blood research work throughout the world.

In addition to establishing his own charitable fund, J. R. D. led Tata Group’s efforts to improve public welfare. In rural areas, the Tatas have developed programs for animal husbandry and craft industries, constructing irrigation works, teaching production skills, preserving culture, initiating education, and providing health and other community services. They have also funded numerous scholarships and scientific research. After natural disasters in India, the Tatas have assisted in reconstruction efforts. In 1974, Tata Steel launched a movement to fight and eliminate smallpox in India, providing money and human resources to organize medical teams working in remote areas.

Ratan also emphasized social responsibility; he has donated many products and services to the poor. In 2009, the Tatas introduced a family car that sells for only Rs100,000 (about $2,200). More recently, Ratan has focused on converting deserts into fertile land and developing new medicines to counteract or eliminate epidemics.

N. R. Narayana Murthy and Infosys Technologies

N. R. Narayana Murthy obtained a master’s degree from the Indian Institutes of Technology in 1969, obtaining a job with Patni Computer Systems Ltd. in Pune. In 1974, a tour of Europe changed him into a determined, compassionate capitalist. He recognized that entrepreneurship, resulting in large-scale job creation, was the only visible mechanism for eradicating poverty. He and six colleagues founded Infosys Technologies in 1981, which chiefly provides global software maintenance for clients in developed countries, such as the United States. It currently maintains offices, research centers, or subcompanies in 23 countries. Its annual revenue increased from $1 billion in 1999 to $3 billion in 2007. Murthy relinquished leadership of Infosys upon his retirement in 2006, but continues to shape the company as nonexecutive chairman.

Creation of Wealth: A Precondition for Distribution

Murthy believed that “the distribution of wealth must, almost without exception, be preceded by the creation of wealth” (Ghoshal 2001, 620). After returning to India from Europe, Murthy began searching for the opportunities to create wealth. He quickly recognized the large difference in salaries between India and developed countries.

Dream Based on a Great Vision

Ever since Murthy and his partners prepared to establish the company, they hoped to create a bright future for themselves, for Indian society, and even for the world. Murthy said, “Our vision is to be a globally respected software corporation providing
best-in-class business solutions employing best-of-breed professionals” (speech 22 May 2001). They built Infosys on three key concepts: (i) criticality of customized software in creating competitive advantage for a corporation, (ii) globalization, and (iii) professionalization of the corporation. In 1999, following years of continually improved technology, Infosys achieved CMM5, a business maturity assessment developed by Carnegie Melon University.11

Market Focus: Key to Business Success
Murthy understood that business success requires extensive knowledge of markets. Used well, that knowledge would help Infosys improve its customer satisfaction levels, reduce costs, shorten delivery time, improve productivity, expand its customer base, and determine its unique position in the market. Initially, India had no market for high-level software maintenance products, so Murthy targeted the G7 countries (Canada, France, Germany, Italy, Japan, United Kingdom, and United States), which eventually provided 90% of the company’s income. These clients also drove Infosys to improve its products. The company’s marketing strategy, which focused on helping customers overcome their reluctance to try new products, involved sending representatives to clients and then moving them on to the next client after completing the project at hand. Called “body shopping” or “business process outsourcing,” this model capitalized on the lower salaries paid to Indian employees to increase company profits. Because the cost of dispatching Infosys employees to clients increased as its client list grew and the scale of projects increased, Murthy again developed a new model—business process outsourcing—to obtain projects overseas but do the work in India. This model not only saved dispatching costs but also improved speed and efficiency, as the time difference translated to continuous operations.

More recently, Infosys developed a value-based system that enhances market superiority. Achieving market value involves developing software service in four fields (finance, health, telecommunications, and engineering) and training local employees to staff a local company. Thus, Infosys bases its marketing strategy on globalization, “sourcing capital from where it is the cheapest, producing where it is most cost-effective, and selling where it is most profitable, all without being constrained by national boundaries.”12

Corporate Code of Ethics
Murthy and his partners established value standards for Infosys from the outset. He emphasized that companies succeed by gaining the respect of its shareholders, fulfilling client needs, treating its employees fairly, and abiding by laws and regulations.

The Infosys ethical code focuses on justice, integrity, honesty, clarity, and high moral standards. The company follows a guiding principle that good business practices benefit not only the company and its employees but also its shareholders, business partners, government, and society.

11 Capability Maturity Model Integration (CMM) is a highly valued quality certification provided by the Software Engineering Institute, Carnegie Mellon University. CMM5 is the highest rating.
12 See Murthy (2001) in a speech made to the Wharton MBA graduating class.
Human Resources: Key to Longevity

Murthy believed that the biggest challenge to Infosys was engaging and retaining the best employees; achieving that goal involved empowering them as individuals. Infosys actively seeks candidates who possess high learning potential. Once they become employees, the company provides extensive training in technology, values, and cultural concepts to ensure its desired team dynamic. Murthy demanded mutual respect and encouraged positive interaction through discussion and debate. In 1993, he publicly announced his intention that Infosys would create 100 millionaires among its employees by 2000, partially through implementation of share options. After realizing the initial goal, Infosys continued this policy, and the number of millionaires continues to grow.

Leadership: Making Dreams Possible

Murthy is a strong role model, and he believes that employees should set high ambitions. Leadership should dare to dream. After inspiring employees to set ambitious goals, Infosys works to convince them that their goals are possible, using a predictability, sustainability, profitability, and de-risking model. In 1998, Infosys decided to become a “real” global company rather than an international company in India. This globalization strategy required Murthy to plan the company’s future rather than be restricted to production indicators, productivity, and quality. Afterwards, he began to decrease his official role, stepping down as chief executive officer in 2006.

Corporate Responsibility

Infosys is very serious about its corporate responsibility to Indian society. Established in 1996, the Infosys Fund helps society’s most disadvantaged people by focusing on health care, social development, rural construction, education, art, and culture.

Dhirubhai Ambani: Reliance Industries Limited

Reliance Industries Limited is recognized as the “miracle company” of India. Its founder, Dhirubhai Ambani, is known as an industrial wizard.

Family difficulties led Dhirubhai Ambani, born in 1932 to a village teacher, to leave school early. He moved to Yemen at the age of 17 to find work and was employed as a filling station manager by a company that sold Shell petroleum. In 1958, Dhirubhai returned to India and used $300 of his savings to establish Reliance Commercial Corporation in Bombay (now Mumbai) that initially exported cashews and peppers, and later imported and exported nylon and synthetic fibers. In 1966, he opened his own synthetics mill. He entered the petrochemical industry during the early 1980s and produced the raw materials for polyester yarn. In 1991, he began to diversify and bought an oil refinery.

---

13 This model is a good forecasting system for sales, based on data gathered on the ground to ensure predictability. Sustainability is achieved by energetic salespeople and by billing and collecting on time. High profitability must be focused to ensure the best returns. In addition, the company must have a good de-risking approach that recognizes, measures, and mitigates risk along every dimension.
By 1993, Reliance had become the largest private company in India, with a market value of Rs80 billion (about $2.7 billion). Reliance was the only Indian company on Business Week’s 1994 list of the 50 largest enterprises in developing countries, and made its first appearance on the Forbes List the same year. In 1994, Dhirubhai became involved with petroleum and natural gas exploration and production. Around 2000, he expanded his business to include telecommunications; financial services; power generation, transmission, and distribution; infrastructure; media; and entertainment. By 2005, Reliance had entered the elite list of Fortune’s top 500 international companies. For many years, the output value of Reliance equaled 3% of India’s gross domestic product.

When Dhirubhai died in 2002, his sons Mukesh Ambani and Anil Ambani vied for control of the family fortune. Mukesh assumed control of Reliance’s chemical fiber textiles and petrochemical interests, as well as its oil refineries, ports, and oil and natural gas extraction interests. He uses the original group name and owns—either directly or indirectly—about $19.5 billion assets according to Forbes 2009 list of billionaires. Anil controls telecommunications; financial services; power generation, transmission, and distribution; infrastructure; and entertainment interests, operating as Reliance Anil Dhirubhai Ambani Group. The market value of his assets in 2009 according to Forbes was $10.1 billion. Anil’s business serves over 100 million customers and has more than 1.2 million shareholders.

Combining Dreams and Effort
Dhirubhai observed a sharp increase in the market demand for synthetic silk at the beginning of 1960. He then seized the opportunity to expand his import and export business to include synthetic fibers. He imported nylon and sold it in India, generating a high profit margin. When the supply of high-grade synthetic silk decreased, he established his own manufacturing plant. In 1966, he established Reliance Textiles Ltd. and began exporting his products to other countries. In 1971, when the government allowed exporters of nylon fabric to import polyester fiber, Dhirubhai moved ahead. He also sold polyester imports to other compound textile manufacturers, realizing a high profit. During that period, 60% of the nylon fabrics exported from India were Reliance products.

After the 1980s, Dhirubhai continued his strategy of backward vertical integration and decided to manufacture polyester fiber, for which domestic demand had increased sharply. Cooperating with DuPont, an American company, he purchased the newest machinery and equipment for this endeavor. In 1991, his petrochemical industry enterprise was ready to manufacture many kinds of previously imported chemicals and raw materials, greatly reducing costs and also reducing market and price risks.

Dhirubhai’s next move involved establishing his own oil refinery. When his refinery began production in 1999, it was the largest grassroots refinery in the world. Its current annual capacity is nearly 33 million tons, and it operates at nearly 100%.

Moreover, after several years of exploration and production of oil and natural gas, Reliance announced in 2002 that it had discovered the largest natural gas field since the early 1970s, the first such discovery by a private enterprise. In 2003, Reliance

---

14 Some in Indian society believed that Dhirubhai influenced the government’s policy. See Tripathi (2004).
found an oil field near Yemen and another high-grade oil point in the Bay of Bengal. In 2004, the company discovered a natural gas field in the seashore in Orissa State in the Bay of Bengal.

**Constantly Looking for New Opportunities**

Dhirubhai was always changing or opening new spheres and amending his own vision. When the government adjusted its foreign exchange policy in late 1970, he shifted the focus of his textile operation, giving new priority to export from the domestic sale. He carefully considered the technical upgrade necessary to produce and export high-grade textiles for saris and other garments and also for Western clothing. Manufactured under ‘Vimal’, his products took the leading position in India. Through widely established commercial networks and a large advertising campaign, Vimal products became popular with Indian consumers. To circumvent the government’s policy of protecting small textile enterprises by creating difficulties for large enterprises, he adopted a strategy to cooperate with smaller companies. That strategy propelled Reliance into becoming the largest and most successful textile enterprise in India.

Similarly, because Dhirubhai moved quickly in the 1990s to enter the fields of telecommunications, Reliance’s telecommunications company has become one of the key suppliers of information and telecommunication services in India. Entering the telecommunications field, Dhirubhai quickly recognized the importance of offering a less-expensive alternative to traditional letters. Competition in telecommunications had ensured that the current rates for telephone and internet services in India are among the cheapest in the world.

**Excellence Breeds Leadership**

During his early career, Dhirubhai imported top technology and equipment not only to improve weaving but also to increase the value of his products. He established a weaving design studio to ensure high-quality and novel design concepts. He worked to make Reliance attain the same standards of excellence that existed in developed countries. That vision and commitment to excellence formed the foundation that supported all of his business ventures.

**Success Demands Confidence**

Positive human relationships and good faith were especially important to Dhirubhai, and his subordinates were divided into three groups. The first included those who worked with him during the initial stage of his business; they were powerful allies who served as middlemen between him and the functional departments of government. The second included high-level personnel who joined Reliance from large Indian companies, especially public companies; they had the skills and experience necessary for great inventions and large projects. The third included young students who graduated from the best universities in India and abroad after 1990 and worked previously for foreign companies; they could bring him international suppliers and consumers. Thus, human relationships allowed Dhirubhai and his companies to obtain all kinds of information, while mutual trust improved efficiency by allowing open discussion.

**Innovation and an Adventurous Spirit**

Innovation and adventure are always linked. After Reliance entered the securities markets in 1979, Dhirubhai issued convertible bonds in the amount of Rs70 million.
Because Dhirubhai assured investors a yield in the form of interest, common people were willing to purchase the bonds; in this way, he expedited the generation of small investors in India. Thereafter, other Indian industrialists adopted this practice. To win investors’ confidence, Dhirubhai frequently issued high-quota bonuses and occasionally awarded shares. Therefore, investors pursued Reliance shares, greatly increasing their value. Upon entering the petrochemical industry, Reliance issued Rs27 billion ($602 million)$^{15}$ in shares, one of the largest issues in the history of Indian companies at that time to finance 580,000 barrels/day export-oriented refinery—the 6th largest in the world at that time. Because Dhirubhai had achieved high rates of return in the past, investors grabbed the opportunity to buy shares.

A prominent characteristic of Reliance involves its extensive shareholder basis and the confidence established by its return rate on investments. In 2005, Reliance had over 3 million shareholders, more than any other Indian company and more than many international companies.

Following in his father’s footsteps, Anil has attracted significant financing from international markets, and he was the first Indian to utilize global depositary receipts. Since 1991, Reliance Industries Limited has financed $2 billion from overseas financial markets.

**Social Responsibility**

Reliance is a leader in providing health care, education, infrastructure, and clean drinking water for their enterprises and in securing production safety and good health for all employees. Reliance also provides special assistance for any natural disasters. The Dhirubhai Ambani Foundation provides scholarships for hundreds of students every year, and the Dhirubhai Ambani International School in Mumbai competes scholastically with the world’s best academic institutions. Moreover, Dhirubhai created hospitals and medicine research centers, such as the Sir Hurkisondas Nurrotumdas Hospital and Research Centre, a charitable hospital.

**Azim Premji: Wipro**

In 1966, Azim Premji returned to India from Stanford University in California to operate a company producing hydrogenated cooking oil previously owned by his father; he was 21 years old. This small company became Wipro, a large and diversified enterprise with annual income of over $5 billion. Since 1990, Wipro has dominated information technology in India. It is among only a few companies in the world to achieve the rank of CMM5. In addition, Wipro was the first Indian company to use Six Sigma information technology.$^{16}$ Presently, Wipro’s annual income is $5 billion, and its business extends to over 50 countries and includes 647 sales centers, 7,200 employees, and 53 development centers.

---

$^{15}$ The issue opened on 3 April 2006. The average exchange rate for that month was Rs44.82 to $1.

$^{16}$ Six Sigma is a rigorous and systematic methodology that utilizes information and statistical analysis to measure and improve a company’s operational performance, practices, and systems by identifying and preventing defects in manufacturing and service-related processes (www.isixsigma.com).
Respond to Change and Grasp Opportunities
Premji believes that change is part of life. He seizes short-, medium-, and long-term opportunities to impel revolutionary progress. Like other successful entrepreneurs, Premji defines himself with power and as a leader of revolution.

In the 1970s, the government placed restrictions on foreign-owned enterprises (e.g., IBM) to retreat from Indian market. Premji predicted that the market demand for computers would increase rapidly, so he grasped the opportunity to produce and occupy the domestic market. When foreign companies entered India in 1991, expecting to compete in the domestic markets, Premji quickly adjusted his industrial structure and transferred its core competitive power to information technology products and services like hardware design, operating systems, and network technology. He also established and expanded several traditional industries.

Dreams, Confidence, and Excellence
From the beginning, Premji sought to establish Wipro as a professional company that could make India proud. He believes that a successful entrepreneur must do everything he can to realize his dreams then, setting development targets for these dreams leaves room to adjust to particular difficulties, and self-confidence figures importantly in overcoming the inevitable obstacles. Premji prepares different plans for each project, covering annual, 3-year, and 5-year segments, using organic and inorganic growth to realize their targets. Inorganic growth includes entering into new technology, new services, and new regions to increase the value of Wipro’s service, enlarge its customer base, and increase the value chain.

Innovation and Competitive Power
Premji is commonly regarded as an innovative entrepreneur, and he expects innovative thought from all of his employees. Wipro also derives its core competency from innovation, which must survive even during failure. Premji believes that failure is an important part of innovation and an elementary part in the process of innovation.

Wipro’s innovations include technology, solutions, and processes. Employees participate in the conception, design, and development of products with independent intellectual property, patent technology, and patents; solve clients’ problems; and pursue process in accordance with excellent international standards to create larger value and to improve competition.

Providing Customers with Value
Providing good-quality, inexpensive products and services drives all of Wipro’s actions. Premji personally controls Wipro’s quality by requiring that each level of directors focuses on quality control. He expects all employees to participate in quality control and devotes one-third of performance evaluations to that responsibility. He carefully investigates customer satisfaction to identify and solve quality problems.

The Wipro Way
Premji has adopted the best ideas from the world’s best corporations and institutions and combined them with his own ideas. “The Wipro Way,” first proposed in 2005, includes the following objectives: (i) establishing superior measurement standards
to ensure the best operation of the information technology service industry and to increase profits, (ii) establishing the best possible business culture, and (iii) pursuing and achieving excellence. Accomplishing these objectives means constant improvement and innovation, planning and implementing an international performance standard, developing evaluation and monitoring mechanisms, satisfying customer needs and expectations, recruiting top candidates, and maintaining an inquisitive and adventurous spirit (Hamm 2007, 151–152).

Stable Leadership and Superior Management

Premji describes Wipro as a diverse and integrated corporation, realized through shared values, outstanding leadership, employee participation, and strong management procedures. He has established a strong, high-level professional management team, which Premji helps develop and support. Senior management changes infrequently. He enlists talents, assigns them to important positions, and encourages them to develop a wide-ranging view of business. Moreover, Wipro cultivates leadership at all corporate levels.

In corporate management, Premji implements two core principles: (i) share power and responsibility with other members of the leadership team, and (ii) conduct business publicly and fairly. Premji’s management style is predictable and fully transparent. His policies eliminate nepotism; decide promotions according to work demands and the advantages and performance of his employees; provide training; advocate and build close relationships and cooperation among team members; encourage employees to openly and freely express their opinions, criticism, and advice; and spur open debate (Hamm 2007, 101–109). Premji’s management model includes

- replacing intrusive judgment with objective fact; guiding the development of enterprise with measurement standards; achieving objectives by combining data, intention, and measurement;
- establishing a target pole management model that recognizes excellent management;
- implementing “target, result, and purpose” management that combines strategic objectives with root performance;
- automating business processes, improving the scientific basis of programs, and keeping customers informed about the progress of their projects;
- maintaining a strict performance evaluation system to review all employees and encourage them to recognize their own achievements, define their career paths, and achieve their personal goals; and
- eliminating extravagance and encouraging thrift (Hamm 2007, 90).

In early 1971, Premji proposed “quick management input,” a fast-paced management method. Special meetings are held every Monday morning to examine the company’s performance during the preceding week, discuss problems, and forecast for the following week. “I have spent a great lot of time to contact my employees, find out the truth of problems and know the situation of every operation in my company. I may not be a direct operator but I’m not just an investor or chairman” (Ghoshal 2001, 426).
Accumulate and Develop Human Resources

Premji recognizes a strong relationship among the accumulation and development of human resources, the development of an enterprise, and power of a nation. In the modern world, the key difference between rich and poor countries involves their ability to release human capacity and translate human capital into economic activities. Human resources development is much more important than economic development. The basic principle supporting the accumulation and development of human resources is respect for the individual accomplished by responsible and humane management.

Premji attributes Wipro's success to the company's employees. Regarding Wipro's human resources development, he said:

“To nurture the young talent in the organisation, there were a number of actions that were necessary. We gave people huge responsibilities early in life, trusted them fully, allowed them to make mistakes, promoted an absolutely professional, open and informal work environment and even compromised on short term results as long as people exhibited potential to develop. We were the first organisation in the country to launch Stock Options as early as in 1983. Our phenomenal growth in sales, profits and businesses excited people to continue to deliver their best and developed in them the pride of working with a high performing organisation. They had to cope with the intellectual challenges that brought out the best in them. We had to obviously match the business growth with best of the people practices, newer approaches to people learning and development and promote a globally competitive work environment that increased the propensity of the employees to choose Wipro over others.”

Social Responsibility

Premji believes that business must shoulder responsibility for society, adhere to the principles of morality and justice while participating in community performance activities, and maintain ecological balance. His charitable activities focus mainly on education, environmental protection, and disaster relief. In 2001, he created the Azim Premji Foundation with his own money, and by 2006 he had donated $125 million in Wipro stock. This fund is used mainly to improve primary education, including teacher training, school administration, and curriculum. Currently, 2.5 million children from 17,000 schools in India receive help and benefit from this fund.

Lessons for Entrepreneurs in the People’s Republic of China

More than 30 years after the start of private enterprise development in the PRC, entrepreneurial enterprises have emerged. The Indian experience, summarized below, should prove useful in their future endeavors.

Unrelenting Entrepreneurial Spirit

Successful entrepreneurs in India were motivated differently as they embarked upon their business careers, including family heritage, identifying new opportunities, great ambition, and survival. They were unrelenting in their effort to survive government regulations and unfavorable domestic conditions. Before and after India’s independence, they prevailed as an important component of India’s economy, and now represent a major force in globalization.

Risk Taking and Innovation

Indian entrepreneurs developed strong, innovative skills and took significant risks while they built their businesses. When recounting their entrepreneurial experiences, they usually stressed dreams, expectations, or the will to succeed. They also emphasized ceaseless innovation (i.e., changing themselves). External environments and conditions always vary, customer demands are unceasing, and markets evolve continually.

Because risk almost always accompanies innovation, successful entrepreneurs left safe and predictable paths. They had some spirit of adventure and usually overcame the risk through dedication and sacrifice.

Business Ethics and Personal Integrity

Indian entrepreneurs usually have good professional ethics and personal integrity. Entrepreneurs’ good faith counters the general impression of empty promises. Their enterprises work hard to keep pace with their competitors in developed countries regarding corporate governance and corporate social responsibility. By ensuring good faith, transparency, and justice, they have gained worldwide recognition.

Sharing Profits with Stakeholders

The pursuit of maximum profits is an unalterable principle, and most entrepreneurs are farsighted in this respect. While executing their business, they work to take care of all stakeholders, including investors, shareholders, consumers, employees, business allies, and society. They work to generate business profits, bonuses, and dividends for investors and shareholders; improved materials, better service, and lower prices for consumers; high salaries and better treatment for employees, including stock equity; and greater benefits for society.

To ensure stakeholder benefits, the boards of directors comprise several committees, e.g., audit committees to ensure financial and accounting transparency, compensation committees to ensure reasonable remuneration for senior officers, shareholder grievance committees regarding the requirements and interests of shareholders, and investment committees to select reasonable and appropriate investments. They do market research to identify products and services that consumers need, and develop higher standards to promote consumer satisfaction.
Humane Working Environment

Indian entrepreneurs often stress the necessity of excellent human resources. These entrepreneurs manage human resources through superior recruitment techniques, training, use, encouragement, and strict rules. They respect their employees’ personalities and freedom and emphasize that employees are an effective part of the enterprise. Outstanding enterprises have a high retention ratio that applies to workers and managers alike. Their respect of people also extends to their competitors, and they consider competition a normal part of business. Open, fair, and sound competition benefits all sides and facilitates social progress.

Social Responsibility

Donating a percentage of corporate profits to charity is a tradition for most entrepreneurs, and they view such donations as reinvestment in society to create greater wealth and improved public welfare.
References

Aditya Birla Group. www.adityabirla.com
Bajaj. www.bajajauto.com
Hero Honda Motors Limited. www.herohonda.com
India Today. 2007. Steel Deal. 12 February.
Mahindra and Mahindra. www.mahindra.com
Ranbaxy Laboratories Limited. www.ranbaxy.com
Reliance Anil Dhirubhai Ambani Group. www.relianceadagroup.com
Reliance Industries Limited. www.ril.com
Tata Group. www.tata.com
Wipro. www.wipro.com
Resurging Asian Giants: Lessons from the People’s Republic of China and India

The economies of the People’s Republic of China and India have seen dramatic growth in recent years. As their respective successes continue to reshape the world’s economic landscape, noted Chinese and Indian scholars have studied the two countries’ development paths, in particular their rich and diverse experiences in such areas as education, information technology, local entrepreneurship, capital markets, macroeconomic management, foreign direct investment, and state-owned enterprise reforms. Drawing on these studies, the Asian Development Bank has produced a timely collection of lessons learned that serves as a valuable refresher on the challenges and opportunities ahead for developing economies, especially those in Asia and the Pacific.

About the Asian Development Bank

ADB’s vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region’s many successes, it remains home to two-thirds of the world’s poor: 1.8 billion people who live on less than $2 a day, with 903 million struggling on less than $1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.