About the Asian Development Bank

The work of the Asian Development Bank (ADB) is aimed at improving the welfare of the people in Asia and the Pacific, particularly the nearly 1.9 billion who live on less than $2 a day. Despite many success stories, Asia and the Pacific remains home to two thirds of the world’s poor. ADB is a multilateral development finance institution owned by 65 members, 47 from the region and 18 from other parts of the globe.

ADB’s vision is a region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their citizens. ADB’s main instruments for providing help to its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance. ADB’s annual lending volume is typically about $6 billion, with technical assistance usually totaling about $180 million a year.

ADB’s headquarters is in Manila. It has 26 offices around the world and has more than 2,000 employees from over 50 countries.
A Small Macroeconometric Model of the People’s Republic of China

Duo Qin
Marie Anne Cagas
Geoffrey Ducanes
Nedelyn Magtibay-Ramos
Pilipinas Quising
Xin-Hua He
Rui Liu
Shi-Guo Liu

June 2006

Duo Qin is an economist, Marie Anne Cagas and Geoffrey Ducanes are consultants, and Nedelyn Magtibay-Ramos and Pilipinas Quising are economics officers at the Macroeconomics and Finance Research Division, Economics and Research Department, Asian Development Bank. Xin-Hua He is research fellow, and Rui Liu and Shi-Guo Liu are assistant research fellows at the Institute of World Economics and Politics, Chinese Academy of Social Sciences.
FOREWORD

The ERD Working Paper Series is a forum for ongoing and recently completed research and policy studies undertaken in the Asian Development Bank or on its behalf. The Series is a quick-disseminating, informal publication meant to stimulate discussion and elicit feedback. Papers published under this Series could subsequently be revised for publication as articles in professional journals or chapters in books.
## CONTENTS

Abstract vii

I. Introduction 1

II. Economy, Data, and Existing Models 2
   A. The PRC Economy 2
   B. Data 2
   C. Existing Models 3

III. Basic Structure of the PRC Model 3
   A. Household Income and Consumption Block 4
   B. Labor and Employment Block 4
   C. Production Block 4
   D. Investment Block 5
   E. Government Block 5
   F. Trade Block 5
   G. Price and Wage Block 5
   H. Monetary Block 5

IV. Model Performance 6

V. Conclusion 10

Appendix 38

References 42
This paper describes a quarterly macroeconometric model of the economy of People’s Republic of China. The model comprises household consumption, investment, government, trade, production, prices, money, and employment blocks. The equilibrium-correction form is used for all the behavioral equations and the general→simple dynamic specification approach is adopted in order to ensure the best possible blend of *a priori* long-run theories with *a posteriori* identified short-run factors, as well as country-specific features. The tracking performance of the model is evaluated. Forecasting and empirical investigation of a number of topical macroeconomic issues utilizing model simulations have shown the model to be immensely useful.
I. INTRODUCTION

This paper outlines key features of an Asian Development Bank (ADB) model of the economy of People’s Republic of China (PRC), which is adapted and augmented from China_QEM, a quarterly macroeconometric model built by the Institute of World Economics and Politics (IWEP), Chinese Academy of Social Sciences.\(^1\) First started in early 2004, model adaptation and augmentation have taken more than a year due primarily to the inherent difficulty in modeling a highly vibrant economy like the PRC as well as major revisions in the country’s historical data, particularly the revision on the sectoral components of gross domestic product (GDP) in early 2005.\(^2\)

The scale of the model is essentially based on the *Asian Development Outlook* (ADO) data sheet as well as data availability, since the primary purpose of the modeling project is to strengthen preparation of the ADO publication.\(^3\) To facilitate the need for forecasting and policy simulation, the model is guided by the main criteria that all behavioral equations should be economically meaningful; all parameter estimates relatively robust and time-invariant; dummy variables used as rarely as possible; and variables representing policy instruments have valid properties of exogeneity. The model has the following main characteristics:

(i) **Economic structure.** The model reflects the essence of a transitional economy. This is achieved by extending economic theories purely for market economies to incorporate certain institutional factors pertaining to a mixed economy. Many equations are demand-oriented to reflect a high degree of marketization. It also contains a number of supply-side equations. In particular, the supply side of GDP plays a central role in the real-sector part of the model, a feature absent in most of the existing macroeconometric models in the PRC.

(ii) **Econometric methods.** The Equilibrium/Error Correction Model form is used for all behavioral equations to embed long-run economic theories into adequately specified dynamic equations following the dynamic specification approach (see Hendry 1995). To ensure within-sample coefficient constancy, we used recursive estimation methods and/or parameter constancy tests extensively. We also minimized the use of dummy variables, except for seasonal dummies, as imposition of occasional dummies often indicates lack of super exogeneity and significantly reduces the policy simulation capacity of the model.

---

\(^1\) China_QEM was first built in 2002 and became relatively settled in 2004 (see He et al. 2005).

\(^2\) The model has had several earlier versions, including the one used for the *ADO 2004 Update* (ADB 2004).

\(^3\) The purpose of the modeling project is spelled out in the 2004 ADO Regional Technical Assistance Report (RETA: OTH 37423; see ADB 2004): “To improve the content and quality of ADO and ADO Update by developing quantitative tools/econometric models in support of ADB’s short- and medium-term country economic analysis.” The RETA also specifies the required basic functions of the models: “to generate the short- and medium-term economic forecasts” and “to improve the analytical content of ADO and ADO Update through quantitative analysis of economic policy.”
Section II sketches the PRC macroeconomy, data, and literature on the existing models. Section III describes the main behavioral equations of the model. Section IV summarizes the model performance results. Section V concludes. Appendix 1 contains the definition of variables and their data sources. A list of the equations and the key diagnostic test results of the estimated equations are given in Appendix 2.

II. ECONOMY, DATA, AND EXISTING MODELS

A. The PRC Economy

The PRC economy has experienced tremendous transformation and record-high growth during the last two decades since the start of economic reforms in 1978. The reforms progressed gradually from farming to commerce, to state-owned enterprises, then to government finance and banking. A so-called “socialist market economic system” was established in the early- to mid-1990s. For instance, over 80% of the agricultural products and most industrial products have been trading at market prices since 1993 (see Cai and Lin 2004, Wang 2002). The Law of the People’s Bank of China (PBC) and the Law of Commercial Banks of China were also released in 1995, making PBC a central bank independent of commercial bank loans and fiscal controls (see Shang 2000). In 1994, the managed floating regime was adopted, and the foreign trade sector became self-managed.4

B. Data

In order to make the ADB model useful for policy analysis, we choose a quarterly frequency, as this is the highest frequency at which GDP is accounted, and because much of the short-run dynamic adjustments of an economy to policy shocks occur within one to a few quarters.

Collection of a quarterly data set with an adequate sample size is quite challenging for the PRC case, especially for the GDP components. Experiments to convert the national accounting system from the material product system under the old centrally planned regime to the system of national accounts began in 1985. Although the system of national accounts was formally adopted in 1993, published statistical series are few, short, and infrequent.5

The data set was collected by the IWEP in collaboration with the National Bureau of Statistics of China. Most of the time series start from 1992, the year from which the National Bureau of Statistics of China released quarterly GDP from the production side. Due to various constraints, these quarterly series are not seasonally adjusted and are often significantly readjusted after annual data is published to make them consistent with the annual accounts. When quarterly data are unavailable, annual series are interpolated into quarterly series. Appendix 1 gives a full list of all the series used in the model and the data sources.

---

4 See He et al. (2005, chapter 3) for a detailed review of the PRC’s economic dynamics during the last two decades.
5 For a detailed description of the evolution of the PRC national accounting systems, see Xu (2000).
C. Existing Models

Macroeconometric research started in the PRC in the early 1980s. Early models were built in close association with Project LINK. The models are commonly large and based on annual data series. As annual series have to go back to the prereform period for estimation purposes, many of the equations carry significant features of the old centrally planned regime. Models built using quarterly series and following the dynamic specification approach were first experimented on by the Institute of Quantitative and Technical Economics of CASS. However, their models are currently out of maintenance. The PBC has recently developed a small quarterly model mainly for analyzing the interaction between the macroeconomy and monetary policy (see Liu 2003). In terms of econometrics, these quarterly models have given greater attention to the time-series properties of data than those earlier annual models.6

III. BASIC STRUCTURE OF THE PRC MODEL

The PRC model is roughly divided into the following blocks: income and consumption, labor and employment, investment, government, foreign trade, GDP sectors, price and wage, and monetary. There are 73 endogenous variables and 16 exogenous variables. Specification and estimation of all

---

6 See He et al. (2005, chapter 4) for a detailed review of the major existing macroeconometric models in the PRC.
the behavioral and linking equations is carried out using PcGive and PcGets (see Doornik and Hendry 2001 and Hendry and Krolzig 2001). Model forecasts and simulations are performed in WinSolve (see Pierse 2001). Figure 1 depicts a simple flow chart of the model. The following briefly describes the key equation structure of each block.

A. Household Income and Consumption Block

Household income and consumption are modeled separately for urban and rural areas. *Per capita income of urban households* is explained mainly by average earnings per urban employee. Unemployment rate also exerts a negative effect on per capita urban income. *Per capita cash income of rural household* is modeled via the total income of rural households, which depends on the output of the three sectors and unemployment rate in the long run. *Urban per capita consumption* is explained in the long run by urban household income and real interest rate while also affected by inflation in the short run. *Rural per capita consumption* is explained by rural household income in the long run while in the short run, inflation exerts some effect. Aggregation of the two consumption series via population leads to the aggregate private consumption component in GDP.

B. Labor and Employment Block

*Labor force* depends mainly on population. *Total Employment* is explained by real GDP and urban wage rate. These two variables define *unemployment rate*. *Secondary sector employment* and *tertiary sector employment* are determined mainly by their sector real output and urban wage rate respectively, whereas *primary sector employment* is derived from total employment net of the employment of the other two sectors.

C. Production Block

A *long-run GDP* is specified as following a standard production function with constant returns to scale. This variable enables us to define a “GDP gap” variable as the deviation of GDP from long-run GDP.

*Real output of both the primary and tertiary sectors* are demand-driven, whereas the *secondary sector real output* follows a production function with constant returns to scale in the long run. The degree of openness is also found to affect the secondary sector real output.

Nominal output of the three sectors is modeled via their price deflators. These deflators are mainly linked with various price indices modeled in the price block.

\footnote{A detailed description of an early version of these two equations is in He and Qin (2004). However, as the investment data series have been redefined after the publication of that paper, the equation specification is now somewhat different. See also Qin and Song (2003) and Qin, Cagas, Quising, and He (2005) for more discussions of the investment issue.
D. Investment Block

The total domestic investment in fixed assets is disaggregated into government investment and business-sector investment. Government investment, measured by fiscal expenditure on capital construction and innovation, serves mainly as a fiscal policy instrument targeted at reducing unemployment and smoothening the GDP gap (see the Production block). Changes in government investment are found to impact on business-sector investment, which otherwise follows a factor-demand equation with real GDP and real lending rate playing the key explanatory roles.7 FDI (foreign direct investment) is modeled separately and determined primarily by GDP, relative factor prices, and interest rate differentials.

E. Government Block

Government expenditure comprises government investment and noninvestment expenditure, the latter being mainly explained by government revenue and linked to government consumption on the expenditure side of GDP. Government revenue is explained by tax revenue, which is composed of tariffs on trade, agricultural tax, and business tax mainly from the secondary and tertiary sectors.

F. Trade Block

Imports is explained in the long run by domestic demand and exports whereas inflation in the investment price is also found to exert certain short-run impact. Exports is simply linked to a world import demand variable, which is computed from a trade matrix comprising imports from the PRC by 30 countries and regions that historically have accounted for over 90% of the PRC’s exports.

G. Price and Wage Block

Consumer price index is expressed simply as retail markup of industrial output price and import price indices in the long run. In addition, wage rate changes and the GDP gap are found to impact on inflation. The latter factor provides us with a useful macro measure of “overheating.” Industrial output price is dependent mainly on import price index, investment price index, and ratio of wage earnings per urban employee over per capita output from the secondary sector. Fixed investment price index is mainly explained by the secondary sector deflator, import price index, and bank lending rate. Import price index follows the world price index and exchange rate while also being affected by export price dynamics. In fact export and import price indices are mutually dependent.8

Urban wage rate is explained by labor productivity in the secondary and tertiary sectors.

H. Monetary Block

This block of the model follows the fundamental ideas of the Polak (1957 and 1997) model, which is based on the key entries of two balance sheets: the balance sheet of the total banking

---

7 When endogenous variables are found to be mutually dependent, simultaneous-equation estimation is performed to check for simultaneity bias.
sector and the balance sheet of the monetary authority (see Qin, He, Liu, and Quising 2005 for a detailed description of this block).

The total banking sector balance sheet is linked to the real economy via broad money, $M_2$, and net foreign assets. $M_2$ is explained via its two components: $M_1$ and quasi-money. $M_1$ follows a demand-driven equation with real GDP and real interest rate being the key long-run explanatory variables. Quasi-money is mainly explained by potential savings, i.e., household income less household consumption, and deposit interest rate. Net foreign assets is explained mainly by foreign trade balance and foreign direct investment.

The purpose of modeling the balance sheet of the monetary authority is to identify how monetary policies affect the economy. A key policy instrument identified is the imbalance between the monetary base and the base money supply, since the PBC has rarely adjusted interest rates on lending and deposits over the sample period. Monetary base comprises currency issue and reserve money. Currency issue is explained by $M_1$ and a gradual downward trend reflecting the impact of technological progress such as electronic transactions on cash demand. Reserve money is modeled via excess reserves in terms of the excess reserve ratio. This ratio depends mainly on the required reserves ratio, the ratio of money supply to the monetary base, and the lending rate. Base money supply is modeled via the ratio of its excess supply to monetary base, which is found to be dependent on inflation.

IV. MODEL PERFORMANCE

The model is evaluated for both within-sample and out-of-sample predictive performance. Empirical studies of a number of macroeconomic issues by means of model simulations have also demonstrated the usefulness of the model.

(i) **Within-sample performance:** Using historical data, static solutions of the model are generated. Figure 2 depicts the static simulations versus the actual values of four key macroeconomic variables in terms of their year-on-year growth rates: GDP, $M_1$, inflation in terms of the consumer price index, and unemployment. The fitted and actual values would be too close to be visually differentiable if they are plotted in levels. In addition, conventional statistics such as the root mean square percentage errors (RMSPE) and the mean percentage errors (MPE) are also calculated. Table 1 presents these statistics for a number of key variables. As seen from the table, the model tracks these major macro indicators reasonably well.

(ii) **Out-of-sample performance:** We evaluate out-of-sample performance through stochastic simulations. The McCarthy method is used here to generate random shocks from individual equation residuals for a specified sample period. Five hundred stochastic simulations are carried out and quantiles are computed to characterize the distribution of the simulated results. Figure 3 presents the stochastic forecasts of eight selected

---

9 There is a small difference between the item of $M_0$ issue on the balance sheet of the central bank and the item of $M_0$ in circulation on the balance sheet of the banking survey. $M_0$ issue is approximately 1.09 times of $M_0$ in circulation.
variables. Three curves are plotted for each variable: the simulated values at 2% quantile, 50% quantile, and 97% quantile. We regard the series at the 50% quantile as the approximate mean forecast, and the series at the 2% quantile and at the 97% quantile approximately as forming the 95% confidence interval.\(^1\)

In addition to the above, the model has proved to be immensely useful in assisting in-depth analysis of topical macroeconomic issues. For example, Qin, He, Liu, and Quising (2005) carry out various simulations to show how monetary policy impacts on the economy via different instruments; Qin, Cagas, Quising, and He (2005) apply impulse analysis to investigate how much and in what ways investment and output affect each other; Qin, Cagas, Ducanes, and He (2005) extend the household block of the model to incorporate income inequality indices into the consumption equations to study the impact of increasing income inequality on growth.

\(^1\) For the detailed description of the stochastic simulations, see Pierse (2001).
### TABLE 1
**Prediction Statistics of the PRC Model, 1994Q1–2005Q2**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>RMSPE</th>
<th>MPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary sector real output</td>
<td>0.0095</td>
<td>-0.0010</td>
</tr>
<tr>
<td>Secondary sector real output</td>
<td>0.0241</td>
<td>-0.0035</td>
</tr>
<tr>
<td>Tertiary sector real output</td>
<td>0.0094</td>
<td>-0.0017</td>
</tr>
<tr>
<td>Per capita income of urban households</td>
<td>0.0301</td>
<td>-0.0043</td>
</tr>
<tr>
<td>Per capita income of rural households</td>
<td>0.1047</td>
<td>0.0118</td>
</tr>
<tr>
<td>Per capita consumption of urban households</td>
<td>0.0321</td>
<td>0.0150</td>
</tr>
<tr>
<td>Per capita consumption of rural households</td>
<td>0.0497</td>
<td>-0.0073</td>
</tr>
<tr>
<td>Business sector real investment</td>
<td>0.1819</td>
<td>0.0077</td>
</tr>
<tr>
<td>Government real investment</td>
<td>0.1187</td>
<td>0.0177</td>
</tr>
<tr>
<td>Government expenditure</td>
<td>0.0897</td>
<td>0.0046</td>
</tr>
<tr>
<td>Government revenue</td>
<td>0.0141</td>
<td>0.0009</td>
</tr>
<tr>
<td>Narrow money (M1)</td>
<td>0.0180</td>
<td>0.0015</td>
</tr>
<tr>
<td>Broad money (M2)</td>
<td>0.0082</td>
<td>-0.0014</td>
</tr>
<tr>
<td>Consumer price index</td>
<td>0.0099</td>
<td>-0.0003</td>
</tr>
<tr>
<td>Producer price index</td>
<td>0.0104</td>
<td>0.0012</td>
</tr>
<tr>
<td>Investment price index</td>
<td>0.0157</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Note: The RMSPE and MPE are computed as follows:

$$RMSPE = \sqrt{\frac{1}{T} \sum_{t=1}^{T} \left( \frac{Y_t^s - Y_t^a}{Y_t^a} \right)^2} ; MPE = \frac{1}{T} \sum_{t=1}^{T} \left( \frac{Y_t^s - Y_t^a}{Y_t^a} \right)$$

where $Y^s$ and $Y^a$ are the simulated and actual values of an endogenous variable, respectively and $T$ is the number of simulation periods.
FIGURE 3
STOCHASTIC FORECASTING: KEY VARIABLES

Solid line: forecasts (at 50% quantile); dotted line: confidence interval (at 2% and 97% quantiles).

Note: The simulated GDP is calculated as the sum of the simulated real output of the three sectors.
V. CONCLUSION

Although considerable changes have occurred in the PRC economy over the last two decades, we are able to build a fairly robust econometric model to capture the main macro dynamics and to forecast major macroeconomic indicators of the economy. Real-time forecasts and empirical investigation of a number of topical macroeconomic issues have proven the model to be immensely useful. Further improvements of the model are expected with its continued application to the analysis of the PRC macroeconomy.
### APPENDIX 1
### VARIABLE LIST

<table>
<thead>
<tr>
<th>VARIABLE NAME</th>
<th>DEFINITION</th>
<th>HOW TO GENERATE IN THE MODEL</th>
<th>DATA SOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 BINV_PRC</td>
<td>Business Sector Fixed Capital Formation (million yuan, Total investment in fixed assets less GINV)</td>
<td>Identity</td>
<td>Total investment in Fixed Assets net of GINV, CMEI</td>
</tr>
<tr>
<td>2 BINVc_PRC</td>
<td>Business Sector Fixed Capital Formation (million yuan, in 1992Q1 price)</td>
<td>Endogenous</td>
<td>BINV deflated by P#INV</td>
</tr>
<tr>
<td>3 CAB$$_{PRC}$$</td>
<td>Current Account Balance (million US$)</td>
<td>Endogenous</td>
<td>CSY</td>
</tr>
<tr>
<td>4 DC_PRC</td>
<td>Domestic Credit (billion yuan)</td>
<td>Endogenous</td>
<td>IMF</td>
</tr>
<tr>
<td>5 DEPK%_PRC</td>
<td>Annual Depreciation Rate of Fixed Assets (%)</td>
<td>Exogenous</td>
<td>IWEP</td>
</tr>
<tr>
<td>6 EMP_PRC</td>
<td>Total Employment (million)</td>
<td>Endogenous</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>7 EMP1_PRC</td>
<td>Primary Sector Employment (million)</td>
<td>Identity</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>8 EMP2_PRC</td>
<td>Secondary Sector Employment (million)</td>
<td>Endogenous</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>9 EMP3_PRC</td>
<td>Tertiary Sector Employment (million)</td>
<td>Endogenous</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>10 ER_PRC</td>
<td>Exchange Rate (RMB/1US$, end of period)</td>
<td>Exogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>11 FD_PRC</td>
<td>Foreign Deposits</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>12 FDI$_{PRC}$</td>
<td>Foreign Direct Investment in PRC (Actually Utilized, million US$)</td>
<td>Identity</td>
<td>FDI$ converted by ER</td>
</tr>
<tr>
<td>13 FDI_PRC</td>
<td>Foreign Direct Investment in PRC (Actually Utilized, million yuan)</td>
<td>Endogenous</td>
<td>Interpolated from CSY by NSBC</td>
</tr>
<tr>
<td>14 GCON_PRC</td>
<td>Government Consumption (million yuan)</td>
<td>Identity</td>
<td>GCON deflated by P#C</td>
</tr>
<tr>
<td>15 GCONc_PRC</td>
<td>Government Consumption (million yuan, in 1992Q1 price)</td>
<td>Identity</td>
<td>Computed from GEXP and GREV</td>
</tr>
<tr>
<td>16 GDEF_PRC</td>
<td>Government Deficit (million yuan)</td>
<td>Identity</td>
<td>GDP converted by ER</td>
</tr>
<tr>
<td>17 GDP$_{PRC}$</td>
<td>Gross Domestic Product (million US$)</td>
<td>Identity</td>
<td>CMEI</td>
</tr>
<tr>
<td>18 GDP_PRC</td>
<td>Gross Domestic Product (million yuan)</td>
<td>Identity</td>
<td>GDP converted by ER</td>
</tr>
<tr>
<td>19 GDPc_PRC</td>
<td>Gross Domestic Product (million yuan, in 1992Q1 price)</td>
<td>Identity</td>
<td>CMEI</td>
</tr>
<tr>
<td>20 GDPcSD_PRC</td>
<td>Statistical Discrepancy between Supply Side and Demand Side</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>21 GDPe_PRC</td>
<td>Effective Domestic Demand (million yuan)</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>22 GDPILR_PRC</td>
<td>Long-run supply trend of GDP (million yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>23 GEXP_PRC</td>
<td>Government Expenditures (million yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>24 GINV_PRC</td>
<td>Government Fixed Capital Formation (million yuan, Sum of Expenditure for capital construction and Innovation funds of enterprises)</td>
<td>Identity</td>
<td>CMEI</td>
</tr>
<tr>
<td>25 GINVc_PRC</td>
<td>Government Fixed Capital Formation (million yuan, in 1992Q1 price)</td>
<td>Endogenous</td>
<td>GINV deflated by P#INV</td>
</tr>
<tr>
<td>26 GIR$_{PRC}$</td>
<td>Gross International Reserves (million US$)</td>
<td>Endogenous</td>
<td>CSY</td>
</tr>
<tr>
<td>27 GNP_PRC</td>
<td>Gross National Product (million yuan)</td>
<td>Endogenous</td>
<td>CSY</td>
</tr>
<tr>
<td>28 GREV_PRC</td>
<td>Government Budgetary Revenue (million yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>29 GTAX_PRC</td>
<td>Government Tax Revenues (million yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>30 INV_PRC</td>
<td>Fixed Capital Formation (million yuan)</td>
<td>Identity</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>VARIABLE NAME</td>
<td>DEFINITION</td>
<td>HOW TO GENERATE IN THE MODEL</td>
<td>DATA SOURCES</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------</td>
<td>-----------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>31 INVc_PRC</td>
<td>Fixed Capital Formation (million yuan, in 1992 price)</td>
<td>Endogenous</td>
<td>by CMEI</td>
</tr>
<tr>
<td>32 IRCB%_PRC</td>
<td>Central Bank Rediscount Rate (%)</td>
<td>Exogenous</td>
<td>QB</td>
</tr>
<tr>
<td>33 IRD%_PRC</td>
<td>One Year Interest Rate of Deposit (%)</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>34 IRDD%_PRC</td>
<td>Interest Rate on Demand Deposits (%)</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>35 IRL%_PRC</td>
<td>One Year Interest Rate of Lending (%)</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>36 IRL%_USA</td>
<td>U.S. Prime Lending Rate (%)</td>
<td>Exogenous</td>
<td>Datastream</td>
</tr>
<tr>
<td>37 K_PRC</td>
<td>Stock of Fixed Investment Assets (million yuan)</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>38 LF_PRC</td>
<td>Economically Active Population (million)</td>
<td>Endogenous</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>39 M$_PRC</td>
<td>Imports (million US$)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>40 M_PRC</td>
<td>Imports (million yuan)</td>
<td>Identity</td>
<td>MS converted by ER</td>
</tr>
<tr>
<td>41 Mc_PRC</td>
<td>Imports (million yuan, in 1992 price)</td>
<td>Identity</td>
<td>M deflated by P#M</td>
</tr>
<tr>
<td>42 MO_PRC</td>
<td>PBC currency issue (million yuan)</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>43 M1_PRC</td>
<td>Narrow Money (million yuan)</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>44 M2_PRC</td>
<td>Broad Money (million yuan)</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>45 MB_PRC</td>
<td>Base Money (million yuan, M0 plus RSV)</td>
<td>Identity</td>
<td>Computed from QB</td>
</tr>
<tr>
<td>46 MBS_PRC</td>
<td>Base Money Supply (million yuan, net foreign assets plus net government claims and borrowed reserve by financial institutions at PBC)</td>
<td>Endogenous</td>
<td>Computed from QB</td>
</tr>
<tr>
<td>47 MSP_PRC</td>
<td>Money Supply Policy</td>
<td>Exogenous</td>
<td></td>
</tr>
<tr>
<td>48 NFA_PRC</td>
<td>Net Foreign Assets of the Banking Sector (billion yuan)</td>
<td>Endogenous</td>
<td>QB</td>
</tr>
<tr>
<td>49 NFI_A_PRC</td>
<td>Net Factor Income from Abroad (million yuan)</td>
<td>Endogenous</td>
<td>CSY</td>
</tr>
<tr>
<td>50 PhC_PRC</td>
<td>Consumer Price Index (1992Q1=1)</td>
<td>Endogenous</td>
<td>Computed from CMEI</td>
</tr>
<tr>
<td>51 PhGDP_PRC</td>
<td>GDP Deflator (1992Q1=1)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>52 PhINV_PRC</td>
<td>Price Index of Investment in Fixed Assets (1992Q1=1)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>53 PhM_PRC</td>
<td>Import Price Index (1992Q1=1)</td>
<td>Endogenous</td>
<td>Computed by IWEP</td>
</tr>
<tr>
<td>54 P#P_PRC</td>
<td>Producers Price Index; proxied by Ex-factory Price Index of Industrial Products (1992Q1=1)</td>
<td>Endogenous</td>
<td>Computed from CMEI</td>
</tr>
<tr>
<td>55 P#WX$</td>
<td>World Export Price Index (1992Q1=1)</td>
<td>Exogenous</td>
<td>Computed by ADB</td>
</tr>
<tr>
<td>56 P#X_PRC</td>
<td>Export Price Index (1992Q1=1)</td>
<td>Endogenous</td>
<td>Computed by IWEP</td>
</tr>
<tr>
<td>57 PCONr_PRC</td>
<td>Per Capita Living Expenditure of Rural Household in Cash (yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>58 PCONu_PRC</td>
<td>Per Capita Living Expenditure of Urban Household in Cash (yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>59 PCGDP_PRC</td>
<td>Per Capita Gross Domestic Product (yuan)</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>60 PCINCr_PRC</td>
<td>Per Capita Income in Cash of Rural Household (yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>61 PCINCu_PRC</td>
<td>Per Capita Disposable Income of Household, Urban (yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>62 PCON_PRC</td>
<td>Household Consumption Expenditure (million yuan)</td>
<td>Endogenous</td>
<td>Interpolated from CSY by NSBC</td>
</tr>
<tr>
<td>63 PCONc_PRC</td>
<td>Household Consumption Expenditure (million yuan, in 1992 price)</td>
<td>Identity</td>
<td>PCON deflated by P#C</td>
</tr>
<tr>
<td>64 POP_PRC</td>
<td>Total Population (million)</td>
<td>Exogenous</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>VARIABLE NAME</td>
<td>DEFINITION</td>
<td>HOW TO GENERATE IN THE MODEL</td>
<td>DATA SOURCES</td>
</tr>
<tr>
<td>---------------</td>
<td>------------</td>
<td>-----------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>65 POPr_PRC</td>
<td>Population, Rural (million)</td>
<td>Identity</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>66 POPu%_PRC</td>
<td>Urban Population Over Total Population (%)</td>
<td>Identity</td>
<td>Computed by Identity</td>
</tr>
<tr>
<td>67 POPu_PRC</td>
<td>Population, Urban (million)</td>
<td>Identity</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>68 PSAV_PRC</td>
<td>Potential Saving Deposit (million yuan)</td>
<td>Identity</td>
<td>Interpolated from CSY</td>
</tr>
<tr>
<td>69 RR%_PRC</td>
<td>Required Reserves Ratio</td>
<td>Exogenous</td>
<td>QB</td>
</tr>
<tr>
<td>70 RSV_PRC</td>
<td>Deposits by Financial Institutions at PBC (million yuan)</td>
<td>Endogenous</td>
<td>Computed from QB</td>
</tr>
<tr>
<td>71 STK_PRC</td>
<td>Changes in Inventories (million yuan)</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>72 STKc_PRC</td>
<td>Changes in Inventories (million yuan, in 1992Q1 price)</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>73 TAX%_PRC</td>
<td>Tax Rate (%)</td>
<td>Identity</td>
<td>Exogenous</td>
</tr>
<tr>
<td>74 TAX1_PRC</td>
<td>Proportion of Agriculture Tax</td>
<td>Exogenous</td>
<td>Computed from CSY</td>
</tr>
<tr>
<td>75 TBS_PRC</td>
<td>Trade Balance (in million US$)</td>
<td>Exogenous</td>
<td>CSY</td>
</tr>
<tr>
<td>76 TRF_PRC</td>
<td>Proportion of Tariff in Tax</td>
<td>Exogenous</td>
<td>Computed from CSY</td>
</tr>
<tr>
<td>77 UCC%_PRC</td>
<td>User Cost of Capital (%)</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>78 UEMP%_PRC</td>
<td>Unemployment Rate (%)</td>
<td>Identity</td>
<td>Computed by identity</td>
</tr>
<tr>
<td>79 VA1_PRC</td>
<td>Value Added from Primary Industry (million yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>80 VA1c_PRC</td>
<td>Value Added from Primary Industry (million yuan, in 1992Q1 price)</td>
<td>Endogenous</td>
<td>Computed from CMEI</td>
</tr>
<tr>
<td>81 VA2_PRC</td>
<td>Value Added from Secondary Industry (million yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>82 VA2c_PRC</td>
<td>Value Added from Secondary Industry (million yuan, in 1992Q1 price)</td>
<td>Endogenous</td>
<td>Computed from CMEI</td>
</tr>
<tr>
<td>83 VA3_PRC</td>
<td>Value Added from Tertiary Industry (million yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>84 VA3c_PRC</td>
<td>Value Added from Tertiary Industry (million yuan, in 1992Q1 price)</td>
<td>Endogenous</td>
<td>Computed from CMEI</td>
</tr>
<tr>
<td>85 WAGEu_PRC</td>
<td>Average Earnings of Urban Employed Persons (yuan)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>86 WTS_PRC</td>
<td>World Imports from PRC (million US$)</td>
<td>Exogenous</td>
<td>Computed by ADB</td>
</tr>
<tr>
<td>87 X$_PRC</td>
<td>Export (million US$)</td>
<td>Endogenous</td>
<td>CMEI</td>
</tr>
<tr>
<td>88 X_PRC</td>
<td>Export (million yuan)</td>
<td>Identity</td>
<td>X$ converted by ER</td>
</tr>
<tr>
<td>89 Xc_PRC</td>
<td>Export (million yuan, in 1992 price)</td>
<td>Identity</td>
<td>M deflated by P#M</td>
</tr>
</tbody>
</table>

Note: CMEI means China Monthly Economic Indicators
CSY means China Statistics Yearbook
IFS means International Financial Statistics
QB means Quarterly Banking
IWEP means Institute of World Economics and Politics
### Appendix 2

#### Equation List

**Appendix 2a. Estimated Equations**

<table>
<thead>
<tr>
<th>1. Income and Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1 Income: Urban</strong></td>
</tr>
</tbody>
</table>
| \[ \Delta \ln(\text{PCINCu}_\text{PRC}) = -0.4213 \times \Delta \ln(\text{PCINCu}_\text{PRC}_1) + 0.0254 + 0.2561 \times \Delta \ln(\text{WAGEu}_\text{PRC}) - 0.1265 \times \Delta \text{UEMP\%}_\text{PRC} \]
| \[ 0.0399 \quad 0.0139 \quad 0.0330 \]
| \[ 0.0608 \quad 0.0749 \quad 0.0780 \]
| \[ + 0.20915 \times \text{SQ1} - 0.3629 \times \text{PCINCECM}_\text{PRC}_1 \]
| \[ 0.0324 \quad 0.0542 \quad 0.1127 \quad 0.1561 \]
| \[ \text{PCINCECM}_\text{PRC}_1 = \ln(\text{PCINCu}_\text{PRC}) - \ln(\text{WAGEu}_\text{PRC}) + 0.27 \times \text{UEMP\%}_\text{PRC}_1 \]
|  
| \[ \text{PCINCu}_\text{PRC} = \text{Per Capita Income of Urban Households} \]
| \[ \text{WAGEu}_\text{PRC} = \text{Average Earnings of Urban Employed Persons} \]
| \[ \text{UEMP\%}_\text{PRC} = \text{Unemployment Rate} \]
|  
| **Residual Diagnostics** |
| \[ \text{sigma} \quad 0.03214 \]
| \[ R^2 \quad 0.9560 \]
| \[ \text{No autocorrelation} \]
| \[ F(4,35) = 0.8715 \{0.4907\} \]
| \[ \text{No ARCH} \]
| \[ F(4,31) = 0.2334 \{0.9174\} \]
| \[ \text{Normality} \]
| \[ \text{Chi}^2(2) = 13.554 \{0.0011\}^{**} \]
| \[ \text{Homoscedasticity} \]
| \[ F(9,29) = 0.7352 \{0.6739\} \]
| \[ \text{RESET} \]
| \[ F(1,38) = 0.0158 \{0.9007\} \]
|  
| **1.2 Income: Rural**    |
| \[ \Delta \ln(\text{PCINCr}_\text{PRC} \times \text{POPr}_\text{PRC}) = -6.7149 - 0.2400 \times \Delta \text{UEMP\%}_\text{PRC}_2 + 0.1730 \times \Delta \ln(\text{VA3}_\text{PRC}) \]
| \[ 0.0148 \quad 0.1184 \quad 0.0251 \]
| \[ 0.2138 \quad 0.0618 \quad 0.0547 \]
| \[ - 0.7460 \times \text{PCINCECM}_\text{PRC}_1 \]
| \[ 0.0261 \]
| \[ 0.2961 \]
| \[ \text{PCINCECM}_\text{PRC}_1 = \ln(\text{PCINCr}_\text{PRC} \times \text{POPr}_\text{PRC}/10000) - 0.3 \times \ln(\text{VA1}_\text{PRC}) - 0.45 \times \ln(\text{VA2}_\text{PRC}_1) - 0.25 \times \ln(\text{VA3}_\text{PRC}) + 0.2 \times \text{UEMP\%}_\text{PRC}_1 + 0.42 \times \text{SQ2} + 0.13 \times \text{SQ3} \]
| \[ \text{PCINCr}_\text{PRC} = \text{Per Capita Income in Cash of Rural Households} \]
| \[ \text{POPr}_\text{PRC} = \text{Population, Rural} \]
| \[ \text{UEMP\%}_\text{PRC} = \text{Unemployment Rate} \]
| \[ \text{VA1}_\text{PRC} = \text{Value Added from the Primary Industry} \]
VA2_PRC = Value Added from the Secondary Industry
VA3_PRC = Value Added from the Tertiary Industry

Residual Diagnostics

sigma 0.0643
R2 0.9661
No autocorrelation F(3,36) = 0.7543 [0.5271]
No ARCH F(3,33) = 0.4236 [0.7373]
Normality Chi^2(2) = 0.6479 [0.5271]
Homoscedasticity F(6,32) = 0.6453 [0.5271]
RESET F(1,38) = 0.6479 [0.5271]

Stability

sigma 0.0643
R2 0.9661
No autocorrelation joint parameter constancy 0.1445
No ARCH joint parameter constancy 0.6479
Normality joint parameter constancy 0.6479
Homoscedasticity joint parameter constancy 0.6479
RESET joint parameter constancy 0.6479

1.3 Consumption: Urban

\[
\Delta_2 \ln(\text{PCCONu}_\text{PRC}) = -0.433765\Delta_2 \ln(\text{PCCONu}_\text{PRC} - 2) - 0.0570 - 0.03373 (\text{SQ1 + SQ2}) \\
\]

Residual Diagnostics

sigma 0.0248
R^2 0.9232
No autocorrelation F(3,36) = 2.5124 [0.0755]
No ARCH F(3,33) = 2.7165 [0.0622]
Normality Chi^2(2) = 0.7686 [0.6809]
Homoscedasticity F(9,26) = 0.9385 [0.5097]
RESET F(1,35) = 0.8442 [0.3645]

1.4 Consumption: Rural

\[
\Delta \ln(\text{PCCONr}_\text{PRC}) = -0.2162 \Delta \ln(\text{PCCONr}_\text{PRC} - 1) - 0.2400 + 0.1000 \cdot \text{SQ1} - 0.1500 \cdot \text{SQ2} - 0.0700 \cdot \text{SQ3} \\
\]

Residual Diagnostics

sigma 0.0418
R^2 0.9801
No autocorrelation F(3,27) = 0.7066 [0.5565]
No ARCH F(3,26) = 2.4427 [0.0888]
1.5 Consumption

\[ \Delta \ln(\text{PCON}_\text{PRC}) = 0.1162 * \text{DST92Q1990Q4} + 0.0930 * \text{DST0001010Q} + 0.0470 * \text{DST2002Q2} + 0.028617 * \text{SQ1} \]

\[ + 0.7778 * \Delta \ln((\text{PCCONu}_\text{PRC} * \text{POPu}_\text{PRC}) + (\text{PCCONr}_\text{PRC} * \text{POPr}_\text{PRC})) \]

\[ + 0.180484 * \Delta \ln(\text{PCCONr}_\text{PRC} * \text{POPr}_\text{PRC}) - 0.3978 * \text{PCONECM}_\text{PRC} - 1 \]

\[ \text{PCONECM}_\text{PRC} = \ln(\text{PCON}_\text{PRC}) - \ln((\text{PCCONu}_\text{PRC} * \text{POPu}_\text{PRC}) + \ln(\text{PCCONr}_\text{PRC} * \text{POPpr}_\text{PRC})) \]

PCON_PRC = Household Consumption Expenditure
PCCONu_PRC = Per Capita Living Expenditure of Urban Households in Cash
PCCONr_PRC = Per Capita Living Expenditure of Rural Households in Cash
POPu_PRC = Population, Urban
POPpr_PRC = Population, Rural

Residual Diagnostics

sigma 0.0058
R² 0.9991
No autocorrelation F(3,25) = 0.5115 [0.6780]
No ARCH F(3,22) = 0.0390 [0.9894]
Normality Chi²(2) = 1.1912 [0.5512]
Homoscedasticity F(10,17) = 1.3216 [0.2947]
RESET F(1,27) = 1.7948 [0.1915]
Sample Period 1995(1) to 2003(4)

2. Investment

2.1 Investment: Business Sector Investment, constant price

\[ \Delta \ln(\text{BINVc}_\text{PRC}) = -5.8367 + 0.235 * \text{SQ3} - 0.27465 * \Delta \ln(\text{BINVc}_\text{PRC}) - 0.35154 * \Delta \text{IRL\%}_\text{PRC} \]

\[ + 0.0396 * \text{IRL\%}_\text{PRC} - 0.1123 * \Delta \ln(\text{GINVc}_\text{PRC}) - 0.0931 * \Delta \ln(\text{BMVc}_\text{PRC}) \]

\[ - 0.1384 * \Delta \ln(\text{GINVc}_\text{PRC}) - 0.08383 * \Delta \ln(\text{GDPc}_\text{PRC}) + 0.0308 * \Delta \ln(\text{P#INV}_\text{PRC}) \]

\[ - 0.7987 * \Delta \ln(\text{P#INV}_\text{PRC} / \text{P#GDP}_\text{PRC}) - 0.5473 * \Delta \ln(\text{P#M}_\text{PRC}) \]

\[ + 0.6194 * \Delta \ln(\text{BMVc}_\text{ECM}_\text{PRC}) - 0.4556 * \Delta \ln(\text{BMVc}_\text{ECM}_\text{PCCONr}_\text{PRC}) \]

\[ + 0.0910 * \Delta \ln(\text{B21}) - 0.0384 \]

\[ \text{BINVcECM}_\text{PRC} = \ln(\text{BINVc}_\text{PRC}/\text{GDPc}_\text{PRC}) + 0.01*[\text{IRL\%}_\text{PRC} - 100*\text{P#INV}_\text{PRC}] - \ln(\text{GINVc}_\text{PRC}) \]

\[ \text{BINVc}_\text{PRC} = \text{Business Sector Investment} \]
\[ \text{IRL\%}_\text{PRC} = \text{One-year Interest Rate on Lending (％)} \]
\[ \text{GDPc}_\text{PRC} = \text{Gross Domestic Product, in 1992Q1 Price} \]
\[ \text{GINVc}_\text{PRC} = \text{Government Budgetary Investment} \]
\[ \text{P#INV}_\text{PRC} = \text{Investment Price Index (1992Q1=1)} \]
Residual Diagnostics

<table>
<thead>
<tr>
<th>Sigma</th>
<th>0.1871</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.6405</td>
</tr>
<tr>
<td>No autocorrelation</td>
<td>F(3,30) = 4.7339 [0.0081]**</td>
</tr>
<tr>
<td>No ARCH</td>
<td>F(3,27) = 2.8344 [0.0569]</td>
</tr>
<tr>
<td>Normality</td>
<td>Chi²(2) = 1.2876 [0.5253]</td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>F(17,15) = 0.9528 [0.5421]</td>
</tr>
</tbody>
</table>

Sample Period 1994(1) to 2004(3)

2.2 Investment: Government Budgetary Investment, constant price

\[ \Delta_4 \ln(GINVc_{PRC}) = 4.73494 - 0.3944 * \Delta \ln(GINVc_{PRC} - 4) - 1.9814 * \Delta \ln(GDP_{PRC} / GDPLR_{PRC} - 3) \]
\[ \begin{bmatrix} 0.5825 \\ 0.0598 \\ 0.0669 \\ 0.1435 \\ 0.22396 \end{bmatrix} \]
\[ = -1.5481 * SQ1 - 0.7099 * GINVcECM_{PRC} - 4 \]
\[ \begin{bmatrix} 0.1821 \\ 0.0919 \\ 0.1107 \\ 0.0872 \end{bmatrix} \]

\[ GINVcECM_{PRC} = \ln(GINVc_{PRC}) - 0.35*\ln(GREV_{PRC}/P#GDP_{PRC}) - 0.25*UEMP\%_{PRC} + 0.9*\ln(GDP_{PRC}/GDPLR_{PRC}) \]

\[ GINVc_{PRC} = \text{Government Budgetary Investment in 1992Q1 price} \]
\[ GDP_{PRC} = \text{Gross Domestic Product} \]
\[ GDPLR_{PRC} = \text{Long-Run Supply Trend of GDP} \]
\[ GREV_{PRC} = \text{Government Budgetary Revenue} \]
\[ P#GDP_{PRC} = \text{GDP Deflator} \]
\[ UEMP\%_{PRC} = \text{Unemployment Rate} \]

Residual Diagnostics

<table>
<thead>
<tr>
<th>Sigma</th>
<th>0.1090</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.7150</td>
</tr>
<tr>
<td>No autocorrelation</td>
<td>F(3,30) = 0.6834 [0.5692]</td>
</tr>
<tr>
<td>No ARCH</td>
<td>F(3,27) = 0.94795 [0.4313]</td>
</tr>
<tr>
<td>Normality</td>
<td>Chi²(2) = 4.8536 [0.0883]</td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>F(7, 25) = 0.6903 [0.8290]</td>
</tr>
<tr>
<td>RESET</td>
<td>F(1,32) = 0.0722 [0.7899]</td>
</tr>
</tbody>
</table>

Sample Period 1995(1) to 2004(2)

2.3 Foreign Direct Investments, in US Dollars

\[ \Delta_4 \ln(FDI$_{PRC}) = 0.2091 * \text{DST02Q2Q4Q2} - 1.1387 + 0.878 * \Delta \ln(GDPS_{PRC}) + 0.0418 * (IRL\%_{PRC} - 1 - IRL\%_{USA} - 1) \]
\[ \begin{bmatrix} 0.0488 \\ 0.2270 \\ 0.0433 \\ 0.0418 \end{bmatrix} \]
\[ + 0.15175 * SQ2 + 4.1333 * \Delta \ln(P#INV_{PRC} - 1) - 0.5481 * FDI$ECM_{PRC} - 4 \]
\[ \begin{bmatrix} 0.0397 \\ 1.9510 \\ 0.0879 \\ 0.1174 \end{bmatrix} \]
\[ \begin{bmatrix} 0.1346 \\ 0.0405 \end{bmatrix} \]

\[ FDI$ECM_{PRC} = \ln(FDI$_{PRC}) - \ln(GDPS_{PRC}) + \ln(P#WX$*ER_{PRC}/P#INV_{PRC}) \]

\[ FDI$_{PRC} = \text{Foreign Direct Investment in PRC, in US$} \]
\[ GDPS$_{PRC} = \text{Gross Domestic Product, in million US$} \]
\[ IRL\%_{PRC} = \text{One-year Interest Rate on Lending} \]
\[ IRL\%_{USA} = \text{Prime Lending Rate} \]
A SMALL MACROECONOMETRIC MODEL OF THE PEOPLE’S REPUBLIC OF CHINA
DUO QIN, MARIE ANNE CAGAS, GEOFFREY DUCANES, NEDELYN MAGTIBAY-RAMOS, XIN-HUA HE, RUI LIU, SHI-GUO LIU

\[
\begin{align*}
\text{P#INV}\_\text{PRC} &= \text{Investment Price Index} \\
\text{P#WXS} &= \text{World Export Price Index} \\
\text{Residual Diagnostics} &\quad \text{Stability} \\
\text{sigma} &= 0.1107 \quad \text{variance} = 1.1021** \\
R^2 &= 0.8357 \quad \text{joint parameter constancy} = 2.0159* \\
\text{No autocorrelation} &= F(4,37) = 1.6231 [0.1890] \\
\text{No ARCH} &= F(4,33) = 1.8591 [0.1411] \\
\text{Normality} &= \text{Chi}^2(2) = 4.3979 [0.1109] \\
\text{Homoscedasticity} &= F(10,30) = 2.2113 [0.0455]^* \\
\text{RESET} &= F(1,40) = 0.1422 [0.7081] \\
\text{Sample Period} &= 1993(2) \text{ to } 2004(4) \\
\end{align*}
\]

2.4 Gross Fixed Capital Formation

\[
\begin{align*}
\Delta \text{INV}\_\text{PRC} &= 6497.91 + 0.6926 \times \Delta (\text{BINV}\_\text{PRC} + \text{GINV}\_\text{PRC} + \text{FDI}\_\text{PRC}) - 0.2576 \times \text{INVECM}\_\text{PRC} - 4 \\
\text{INVECM}\_\text{PRC} &= \text{INV}\_\text{PRC} - 1.3 \times \text{BINV}\_\text{PRC} + \text{GINV}\_\text{PRC} + \text{FDI}\_\text{PRC} \\
\text{INV}\_\text{PRC} &= \text{Gross Fixed Capital Formation} \\
\text{BINV}\_\text{PRC} &= \text{Business Sector Investment} \quad B21 \\
\text{GINV}\_\text{PRC} &= \text{Government Budgetary Investment} \quad B22 \\
\text{FDI}\_\text{PRC} &= \text{Foreign Direct Investment} \quad E \\
\text{Residual Diagnostics} &\quad \text{Stability} \\
\text{sigma} &= 33820.4 \quad \text{variance} = 0.2876 \\
R^2 &= 0.8057 \quad \text{joint parameter constancy} = 0.8362 \\
\text{No autocorrelation} &= F(3,27) = 1.4835 [0.2413] \\
\text{No ARCH} &= F(3,24) = 0.34245 [0.7948] \\
\text{Normality} &= \text{Chi}^2(2) = 5.1150 [0.0775] \\
\text{Homoscedasticity} &= F(10,25) = 14.384 [0.000]^* \\
\text{RESET} &= F(1,29) = 2.8853 [0.1001] \\
\text{Sample Period} &= 1995(4) \text{ to } 2003(4) \\
\end{align*}
\]

3. Government Sector

3.1 Government Revenue

\[
\begin{align*}
\Delta \ln(\text{GREV}\_\text{PRC}) &= 0.0626 \times \text{SO1} - 0.0146 \times \text{SO2} - 0.0400 \times \text{SO3} + 0.9547 \times \Delta \ln(\text{GTAX}\_\text{PRC}) \\
&\quad - 0.4590 \times \text{GREVECM}\_\text{PRC} - 1 \\
\text{GREVECM}\_\text{PRC} &= \ln(\text{GREV}\_\text{PRC}) - \ln(\text{GTAX}\_\text{PRC}) \\
\text{GREV}\_\text{PRC} &= \text{Government Budgetary Revenue} \quad B31 \\
\text{GTAX}\_\text{PRC} &= \text{Government Tax Revenue} \\
\text{Residual Diagnostics} &\quad \text{Stability} \\
\text{sigma} &= 0.1117 \quad \text{variance} = 0.9980 \\
R^2 &= 0.09980 \quad \text{joint parameter constancy} = 0.2319 [0.8730] \\
\text{No autocorrelation} &= F(3,18) = 0.2319 [0.8730] \\
\text{No ARCH} &= F(3,15) = 0.1371 [0.9363] \\
\text{Normality} &= \text{Chi}^2(2) = 4.0680 [0.1306] \\
\end{align*}
\]
Homoscedasticity   \[F(7,13) = 0.7789 \ [0.6161]\]
RESET   \[F(1,20) = 0.5972 \ [0.4487]\]

3.2 Tax Revenue

\[
\text{GTAX}_{\text{PRC}} = \frac{0.722718 \* (1 - \text{TRF}_{\text{PRC}} - \text{TAX1}_{\text{PRC}} - 1) \* \text{GTAX}_{\text{PRC}} - 1 + 0.1110 \* (\text{VA2}_{\text{PRC}} + \text{VA3}_{\text{PRC}})}{(0.0902)}
\]
\[
-0.0655234 \* (\text{VA2}_{\text{PRC}} + 3 + \text{VA3}_{\text{PRC}} + 3) + 9572.33 \* \text{TAX2}_{\text{PRC}} - 10153 \* \text{TAX3}_{\text{PRC}} + 3003.0
\]
\[
+ 12135.6 \* \text{TAX4}_{\text{PRC}} - 4 \]
\[
\frac{(2860.0)}{}
\]
\[
+ \frac{0.2915 \* (\text{TAX1}_{\text{PRC}} - 1 \* \text{VA1}_{\text{PRC}} - 1) + 0.2876 \* (\text{TAX1}_{\text{PRC}} - 4 \* \text{VA1}_{\text{PRC}} - 4) + 0.0161 \* \text{VA1}_{\text{PRC}} - 2}{(0.0965)}
\]
\[
0.6220 \* (\text{TRF}_{\text{PRC}} - 1 \* (\text{X}_{\text{PRC}} - 1 \* \text{M}_{\text{PRC}} - 1)) - 0.01376 \* (\text{X}_{\text{PRC}} - 1 + \text{M}_{\text{PRC}} - 1)
\]
\[
\frac{0.1132}{(0.0051)}
\]
\[
0.0554 \[0.00434\]
\]
\[
+ 0.0196 \* (\text{X}_{\text{PRC}} - 2 + \text{M}_{\text{PRC}} - 2) + 452.658 \* [100 \* (\text{GTAX}_{\text{PRC}} - 3 / \text{GDP}_{\text{PRC}} - 3) - \text{TAX3}_{\text{PRC}} - 3]
\]
\[
\frac{0.0051}{194.30}
\]
\[
0.00472
\]
\[
-19700 - 65473.8 \* SQ1 + 23561 \* DST2004Q1
\]

\text{GTAX}_{\text{PRC}} = \text{Government Tax Revenue}
\text{TRF}_{\text{PRC}} = \text{Tariff Rate}
\text{TAX1}_{\text{PRC}} = \text{Tax Rate for Primary Industries}
\text{VA2}_{\text{PRC}} = \text{Value Added from the Secondary Industry}
\text{VA3}_{\text{PRC}} = \text{Value Added from the Tertiary Industry}
\text{TAX2}_{\text{PRC}} = \text{Tax Rate}
\text{VA1}_{\text{PRC}} = \text{Value Added from the Primary Industry}
\text{GINV}_{\text{PRC}} = \text{Government Fixed Capital Formation}
\text{INV}_{\text{PRC}} = \text{Gross Fixed Capital Formation}
\text{X}_{\text{PRC}} = \text{Exports}
\text{M}_{\text{PRC}} = \text{Imports}
\text{GDP}_{\text{PRC}} = \text{Gross Domestic Product}

\text{Residual Diagnostics (for the aggregate of sectors 2 and 3)}
\text{sigma} = 16790.9
\text{R}^2 = 0.9885
\text{No autocorrelation} \ F(4,31) = 0.8534 \ [0.5026]
\text{No ARCH} \ F(4,27) = 0.6743 \ [0.6156]
\text{Normality} \ \text{Chi}^2(2) = 1.8861 \ [0.3894]
\text{Homoscedasticity} \ F(15,19) = 1.4642 \ [0.2142]
\text{RESET} \ F(1,34) = 1.1286 \ [0.2956]
\text{Sample Period} \ 1993(2) \ to \ 2004(2)

\text{Residual Diagnostics (for sector 1)}
\text{sigma} = 1055.0
\text{R}^2 = 0.9786
\text{No autocorrelation} \ F(4,34) = 2.6243 \ [0.0517]
\text{No ARCH} \ F(4,30) = 0.9433 \ [0.4526]
\text{Normality} \ \text{Chi}^2(2) = 1.4867 \ [0.4755]
\text{Homoscedasticity} \ F(10,27) = 1.4209 \ [0.2241]
### 3.3 Government Consumption

\[
\Delta_4 \ln(G\text{CON}_\text{PRC}) = 0.3900 + 0.1350* \Delta_3 (G\text{EXP}_\text{PRC}_1 - G\text{INV}_\text{PRC}_1) - 0.1875* G\text{CONECM}_\text{PRC} - 0.0388
\]

\[\begin{bmatrix}
0.0608 \\
0.3477
\end{bmatrix}
\begin{bmatrix}
0.0503 \\
0.3681
\end{bmatrix}
\begin{bmatrix}
0.0388 \\
0.3683
\end{bmatrix}
\]

\[
G\text{CONECM}_\text{PRC} = \ln(G\text{CON}_\text{PRC}) - \ln(G\text{REV}_\text{PRC} - G\text{INV}_\text{PRC}) + 0.5*\ln(T\text{IME})
\]

\[
G\text{CON}_\text{PRC} = \text{Government Consumption}
\]

\[
G\text{REV}_\text{PRC} = \text{Government Revenue}
\]

\[
G\text{INV}_\text{PRC} = \text{Government Budgetary Investment}
\]

### Residual Diagnostics

<table>
<thead>
<tr>
<th>(\text{sigma} )</th>
<th>2.1318</th>
<th>(\text{variance} )</th>
<th>0.2946</th>
<th>(\text{R}^2 )</th>
<th>0.9207</th>
<th>(\text{joint parameter constancy} )</th>
<th>1.4146</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{No autocorrelation} )</td>
<td>(F(3,37) = 0.5587 [0.6941] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{No ARCH} )</td>
<td>(F(4,31) = 0.3837 [0.8186] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{Normality} )</td>
<td>(\text{Chi}^2(2) = 4.9080 [0.0859] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{Homoscedasticity} )</td>
<td>(F(10,28) = 0.5752 [0.4529] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{RESET} )</td>
<td>(F(1,38) = 0.5752 [0.4529] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.4 Government Expenditure

\[
G\text{EXP}_\text{PRC} = G\text{INV}_\text{PRC} + \exp[\ln(G\text{EXP}_\text{PRC}_2 - G\text{INV}_\text{PRC}_2) + 0.3250 - 0.7561* S\text{Q}1 - 0.2370* S\text{Q2} + 0.2602* S\text{Q3}]
\]

\[
+ 0.0764 \begin{bmatrix}
0.0503 \\
0.0460
\end{bmatrix} + 0.0958 \begin{bmatrix}
0.0958 \\
0.1031
\end{bmatrix} + 0.0450 \begin{bmatrix}
0.0450 \\
0.4386
\end{bmatrix}
\]

\[
G\text{EXP}_\text{PRC} = \ln(G\text{EXP}_\text{PRC}_1 - G\text{INV}_\text{PRC}_1) - 0.01*U\text{EMP\%}_\text{PRC}_2
\]

\[
G\text{EXP}_\text{PRC} = \text{Government Expenditure}
\]

\[
G\text{INV}_\text{PRC} = \text{Government Fixed Capital Formation}
\]

\[
G\text{CON}_\text{PRC} = \text{Government Consumption}
\]

\[
U\text{EMP\%}_\text{PRC} = \text{Unemployment Rate}
\]

### Residual Diagnostics

<table>
<thead>
<tr>
<th>(\text{sigma} )</th>
<th>0.0837</th>
<th>(\text{variance} )</th>
<th>0.2222</th>
<th>(\text{R}^2 )</th>
<th>0.9752</th>
<th>(\text{joint parameter constancy} )</th>
<th>0.7500</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{No autocorrelation} )</td>
<td>(F(3,37) = 0.0917 [0.9642] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{No ARCH} )</td>
<td>(F(3,34) = 0.3079 [0.8195] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{Normality} )</td>
<td>(\text{Chi}^2(2) = 1.9423 [0.3787] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{Homoscedasticity} )</td>
<td>(F(3,32) = 0.0917 [0.9642] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\text{RESET} )</td>
<td>(F(1,39) = 1.0410 [0.3139] )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Trade

4.1 Exports, in US Dollars

\[
\Delta \ln (X_{PRC}) = -0.436144 \times 0.390963 \Delta \ln (X_{PRC-1}) + 0.7940 \times \Delta \ln (WT_{PRC}) - 0.415278 \times X_{ECM_{PRC}}
\]

\[
\begin{bmatrix}
0.0716 \\
0.0762 \\
0.1228 \\
0.1548 \\
0.7940 \\
0.1103 \\
0.1262
\end{bmatrix}
\]

\[X_{ECM_{PRC}} = \ln (X_{PRC}) - \ln (WT_{PRC-1}) - 0.2 \times \ln (TIME)\]

\[X_{PRC} = \text{Exports in US$}\]

\[WT_{PRC} = \text{World Imports from PRC, in US$}\]

\[
\text{Residual Diagnostics} \quad \text{Stability}
\]

<table>
<thead>
<tr>
<th>sigma</th>
<th>0.0454</th>
<th>variance</th>
<th>0.1592</th>
</tr>
</thead>
<tbody>
<tr>
<td>R^2</td>
<td>0.8941</td>
<td>joint parameter constancy</td>
<td>0.6031</td>
</tr>
</tbody>
</table>

No autocorrelation \( F(3,34) = 1.9262 \times 0.1439 \)

No ARCH \( F(3,31) = 0.0808 \times 0.9700 \)

Normality \( \text{Chi}^2(2) = 2.0832 \times 0.3529 \)

Homoscedasticity \( F(6,30) = 1.0225 \times 0.4299 \)

X-Homoscedasticity \( F(9,27) = 0.9524 \times 0.4985 \)

RESET \( F(1,36) = 1.4860 \times 0.2308 \)

Sample Period 1995(2) to 2005(2)

4.2 Imports, in US Dollars

\[
\Delta \ln (M_{PRC}) = 0.8337 \times \Delta \ln (X_{PRC}) - 0.3399 \times \Delta \ln (M_{PRC-1}) + 0.0700 \times 1.9955 \times \Delta \ln (P#M_{PRC})
\]

\[
\begin{bmatrix}
0.0592 \\
0.0516 \\
0.0923 \\
0.1013 \\
0.1667 \\
0.3811 \\
0.3957
\end{bmatrix}
\]

\[M_{ECM_{PRC}} = \ln (M_{PRC}) - 0.7 \times \ln (X_{PRC-1}) - 0.3 \times \ln (GDP_{PRC-1} - X_{PRC-1}) - 2 \times \ln (P#M_{PRC-1}/GDP_{PRC-1})\]

\[M_{PRC} = \text{Imports, in million US$}\]

\[X_{PRC} = \text{Exports, in million US$}\]

\[P#INV_{PRC} = \text{Investment Price Index}\]

\[GDP_{PRC} = \text{Gross Domestic Product, in million US$}\]

\[P#M_{PRC} = \text{Import Price Index}\]

\[P#GDP_{PRC} = \text{GDP Deflator}\]

\[
\text{Residual Diagnostics} \quad \text{Stability}
\]

<table>
<thead>
<tr>
<th>sigma</th>
<th>0.0554</th>
<th>variance</th>
<th>0.0884</th>
</tr>
</thead>
<tbody>
<tr>
<td>R^2</td>
<td>0.8941</td>
<td>joint parameter constancy</td>
<td>1.3866</td>
</tr>
</tbody>
</table>

No autocorrelation \( F(4,37) = 0.3262 \times 0.8586 \)

No ARCH \( F(4,33) = 2.6483 \times 0.0507 \)

Normality \( \text{Chi}^2(2) = 0.9646 \times 0.6174 \)

Homoscedasticity \( F(9,31) = 1.0690 \times 0.4299 \)

RESET \( F(1,40) = 0.0062 \times 0.9376 \)

Sample Period 1993(3) to 2004(4)
### 4.3 Trade Balance

\[
TB_{PRC} = \left(1 - SQ1 - SQ2 - SQ3\right) \times \left[(X\$_{PRC} - M\$_{PRC}) + (X\$_{PRC - 1} - M\$_{PRC - 1}) + (X\$_{PRC - 2} - M\$_{PRC - 2})
\]
\[
+ (X\$_{PRC - 3} - M\$_{PRC - 3}) + 7286.7\times (1 - SQ1 - SQ2 - SQ3) + 2232.8\times (1 - SQ1 - SQ2 - SQ3) \times DST1999Q4
\]
\[
= \left(984.5\right) \times \left(880.6\right)
\]

\[\text{T41}\]

- \(TB_{PRC}\) = Trade Balance, in million US$
- \(X\$_{PRC}\) = Exports, in million US$
- \(M\$_{PRC}\) = Imports, in million US$

**Residual Diagnostics**

- \(\text{sigma} = 2784.65\)
- \(R^2 = 0.6810\)

Sample Period 1994(4) to 2004(3)

### 4.4 Current Account Balance

\[
CAB_{PRC} = 0.6800 \times TB_{PRC}
\]

\[\text{T42}\]

- \(CAB_{PRC}\) = Current Account Balance, in million US$
- \(TB_{PRC}\) = Trade Balance, in million US$

**Residual Diagnostics**

- \(\text{sigma} = 2481.71\)
- \(R^2 = 0.9440\)

Sample Period 1992(3) to 2004(3)

### 4.5 Gross International Reserves

\[
\Delta \ln(GIR\$_{PRC}) = 0.2173 \times \Delta_3 \ln(GIR\$_{PRC}) + 0.09968\times \Delta \ln(NFA\$_{PRC} / ER\$_{PRC}) + 0.0224 \times DST2001Q2
\]

\[\text{T43}\]

- \(\text{GIR\$_{ECM\_PRC}} = \ln(GIR\$_{PRC}) - 0.9\times \ln(1000\times NFA\$_{PRC} / ER\$_{PRC})\)
- \(GIR\$_{PRC}\) = Gross International Reserves, in million US$
- \(NFA\$_{PRC}\) = Net Foreign Assets of the Banking Sector
- \(ER\$_{PRC}\) = Exchange Rate

**Residual Diagnostics**

- \(\text{sigma} = 0.0225\)
- \(R^2 = 0.3072\)

No autocorrelation
- \(F(3,31) = 0.4032 \times 0.7517\)

No ARCH
- \(F(3,28) = 0.8274 \times 0.4900\)

Normality
- \(\text{Chi}^2(2) = 0.6807 \times 0.7115\)

Heteroskedasticity
- \(F(7,26) = 1.9581 \times 0.1005\)

X-Heteroskedasticity
- \(F(13,20) = 1.3468 \times 0.2667\)

RESET
- \(F(1,33) = 7.5850 \times 0.0095**\)

Sample Period 1994(4) to 2004(2)

### 5. GDP and the 3 Sectors

#### 5.1 Long-run Supply Trend of GDP

\[
GDPLR\_PRC = \exp[-0.9241 + 0.85\times \ln(K\_PRC) + 0.15\times \ln(EMP\_PRC)]
\]

\[\text{T51}\]

- \(GDPLR\_PRC\) = Long-run Supply Trend of GDP
- \(K\_PRC\) = Stock of Fixed Investment Assets
- \(EMP\_PRC\) = Total Number of Employed Persons
5.2 Value Added from the Primary Sector via deflator

\[ \Delta_4 \ln(VA_{1\text{PRC}}) = \Delta_4 \ln(VA_{1\text{cPRC}}) + 0.0800 + 0.0750 * DST2004Q1 + 0.03947 * SQ1 + 0.1374 * SQ2 \\
+ 1.0880 * \Delta_4 \ln(P#C_{PRC}) - 0.6777 * [VA_{1\text{cPRC}}_3/(VA_{2\text{cPRC}}_3 + VA_{3\text{cPRC}})] \\
- 0.6332 * [\Delta(P#P_{PRC})_3 - \Delta(P#C_{PRC})_3] - 0.4167 * VA_{1\text{ECM}_{PRC}}_4 \\
\]

\[ VA_{1\text{ECM}_{PRC}} = \ln(VA_{1\text{PRC}}/VA_{1\text{cPRC}}) - \ln(P#C_{PRC}) \]

5.3 Value Added from the Primary Sector, constant price

\[ \Delta_2 \ln(VA_{1\text{cPRC}}) = -0.45868 * \Delta_2 \ln(VA_{1\text{cPRC}}_2) + 2.9000 - 0.766867 * SQ1 - 0.61065 * SQ2 \\
+ 0.0580 \begin{bmatrix} 0.2751 \\ 0.1730 \end{bmatrix} + 0.0275 \begin{bmatrix} 0.0861 \\ 0.1995 \end{bmatrix} + 0.0801 \begin{bmatrix} 0.0176 \\ 0.0825 \end{bmatrix} \\
- 0.0900 * \Delta_2 \ln([VA_{3\text{PRC}}_1/VA_{3\text{cPRC}}_1]/[VA_{1\text{PRC}}_1/VA_{1\text{cPRC}}_2]) \\
\]

\[ VA_{1\text{cECM}_{PRC}} = \ln(VA_{1\text{cPRC}}) - 0.3*[\ln(GDP_{PRC}/VA_{1\text{PRC}/VA_{1\text{cPRC}}}) + 0.6*[\ln([VA_{3\text{PRC}}/VA_{3\text{cPRC}}]/[VA_{1\text{PRC}}/VA_{1\text{cPRC}}]) - 1.25*[\ln(\text{VA}_{2\text{PRC}_2}/\text{VA}_{2\text{cPRC}_2})/\text{GDP}_{PRC}]) \\
- 0.1*[\ln(\text{VA}_{2\text{PRC}_2}/\text{VA}_{2\text{cPRC}_2})/\text{VA}_{1\text{cPRC}_2})] \\
\]

\[ VA_{1\text{cPRC}} = \text{Value Added from the Primary Sector},\text{ in } 1992Q1\text{ price} \]
\[ VA_{3\text{PRC}} = \text{Value Added from the Tertiary Sector} \]
\[ VA_{3\text{cPRC}} = \text{Value Added from the Tertiary Sector},\text{ in } 1992Q1\text{ price} \]
\[ VA_{1\text{PRC}} = \text{Value Added from the Primary Sector} \]
\[ VA_{2\text{PRC}} = \text{Value Added from the Secondary Sector} \]
\[ VA_{2\text{cPRC}} = \text{Value Added from the Secondary Sector},\text{ in } 1992Q1\text{ price} \]
\[ GDP_{PRC} = \text{Gross Domestic Product} \]
### 5.4 Value Added from the Secondary Sector via price deflator

\[
\begin{align*}
\Delta \ln(VA2c\ _{PRC}) &= \Delta \ln(VA2c\ _{PRC}) - 0.3762 \cdot \Delta \ln(VA2c\ _{PRC} \_1 / VA2c\ _{PRC} \_1) - 0.1087 \cdot 0.2796 \cdot S01 \cdot 0.00476 + 0.0070 \cdot 0.0101 \cdot 0.0579 \cdot 0.0521 \\
&+ 0.014 \cdot 0.0193 + 0.2339 \cdot \Delta \ln(VA1\ _{PRC} \_2 / VA1c\ _{PRC} \_2) + 1.6246 \cdot \Delta \ln(P\ #INV\ _{PRC}) \cdot 0.0256 \cdot 0.0825 \\
&- 0.2422 \cdot VA2cECM\ _{PRC} \_1 \\
\end{align*}
\]

\[
VA2cECM\ _{PRC} = \ln(VA2c\ _{PRC}) - 0.55 \cdot (K\ _{PRC} / P\ #INV\ _{PRC}) \cdot (VA2c\ _{PRC} / GDP\ _{PRC}) - 0.45 \cdot \ln(EMP2\ _{PRC}) - 0.25 \cdot (X\ _{PRC} + M\ _{PRC}) / GDP\ _{PRC}
\]

### 5.5 Value Added from the Secondary Sector, constant price (as mainly production function)

\[
\begin{align*}
\Delta \ln(VA2c\ _{PRC}) &= 1.05997 - 0.02258 \cdot S03 + 0.69845 \cdot \Delta \ln(VA3c\ _{PRC}) + 0.1373 \cdot \Delta \ln[(X\ _{PRC} + M\ _{PRC}) / GDP\ _{PRC}] \\
&+ 0.22867 \cdot \Delta \ln[K\ _{PRC} \_1 / P\ #INV\ _{PRC} \_1] \cdot (VA2c\ _{PRC} \_1 / GDP\ _{PRC} \_1)] \\
&- 0.4100 \cdot VA2cECM\ _{PRC} \_1 \\
\end{align*}
\]

\[
VA2cECM\ _{PRC} = \ln(VA2c\ _{PRC}) - 0.55 \cdot (K\ _{PRC} / P\ #INV\ _{PRC}) \cdot (VA2c\ _{PRC} / GDP\ _{PRC}) - 0.45 \cdot \ln(EMP2\ _{PRC}) - 0.25 \cdot (X\ _{PRC} + M\ _{PRC}) / GDP\ _{PRC}
\]
VA2c_PRC = Value Added from the Secondary Sector, in 1992Q1 Price
VA3c_PRC = Value Added from the Tertiary Sector, in 1992Q1 Price
X_PRC = Exports
I301
M_PRC = Imports
I302
GDP_PRC = Gross Domestic Product
I402
K_PRC = Stock of Fixed Investment Assets
I103
P#INV_PRC = Investment Price Index
B65
VA2_PRC = Value Added from the Secondary Sector
B53
EMP2_PRC = Employment in the Secondary Sector
B83

Residual Diagnostics

<table>
<thead>
<tr>
<th></th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>sigma</td>
<td>0.0210</td>
</tr>
<tr>
<td>R²</td>
<td>0.9917</td>
</tr>
</tbody>
</table>

No autocorrelation F(3,34) = 2.5543 [0.0716]
No ARCH F(3,31) = 2.7923 [0.0568]
Normality Chi²(2) = 0.9171 [0.6322]
Homoscedasticity F(9,27) = 2.9296 [0.0147]*
X-Homoscedasticity F(19,17) = 1.2091 [0.3494]
RESET F(1,36) = 3.6097 [0.0655]

Sample Period 1994(4) to 2004(3)

5.6 Value Added from the Tertiary Sector via Price Deflator

\[\ln(\text{VA3}_\text{PRC}) = \ln(\text{VA3}_\text{PRC}_4) + \Delta_4 \ln(\text{VA3c}_\text{PRC}) - 0.3250 - 0.0700 \times \text{SQ2} - 0.0631 \times \text{SQ3} \]
\[
+ 0.3242 \times \ln(P\#C\_\text{PRC}_1) + 0.0619 \times \Delta_3 \ln(P\#M\_\text{PRC}_2) - 0.0623 \times \Delta_4 \ln(WAGEu\_\text{PRC})
\]
\[
+ 0.1185 \times \Delta \ln(WAGEu\_\text{PRC}_3) + 0.00066 \times (\text{VA3}_\text{PRC}_3/\text{GDP}_\text{PRC}_3) - 0.3073 \times \text{VA3ECM}_\text{PRC}_4
\]
\[
+ 0.0269 \times (P\#C\_\text{PRC} - P\#M\_\text{PRC})
\]

VA3ECM_PRC = ln(VA3_PRC/VA3c_PRC) - 0.75*ln(P#C_PRC) - 0.15*ln(WAGEu_PRC) - 0.1*ln(P#M_PRC)

VA3_PRC = Value Added from the Tertiary Sector
VA3c_PRC = Value Added from the Tertiary Sector, in 1992Q1 Price
P#C_PRC = Consumer Price Index (1992Q1=1)
P#M_PRC = Import Price Index
WAGEu_PRC = Average Earnings of Urban Employed Persons
GDP_PRC = Gross Domestic Product

Residual Diagnostics

<table>
<thead>
<tr>
<th></th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>sigma</td>
<td>0.0075</td>
</tr>
<tr>
<td>R²</td>
<td>0.9675</td>
</tr>
</tbody>
</table>

No autocorrelation F(3,28) = 1.7362 [0.1824]
No ARCH F(3,25) = 0.5736 [0.6378]
Normality Chi²(2) = 1.1380 [0.5661]
Homoscedasticity F(14,16) = 0.4648 [0.9216]
RESET F(1,30) = 3.2889 [0.0798]
5.7 Value Added from the Tertiary Sector, constant price

\[ \Delta_4 \ln(VA3c_{PRC}) = 0.0330 - 0.0370 \ast DST030203 - 0.0450 \ast SQ1 + 0.0370 \ast SQ2 - 0.1110 \ast VA3cECM_{PRC} - 4 \\
(0.0133) \quad (0.0051) \quad (0.0106) \quad (0.0110) \quad (0.0230) \\
- 0.2100 \ast \Delta [\ln(VA2_{PRC} - 1) / VA2c_{PRC} - 1] / [VA3_{PRC} - 1] / VA3c_{PRC} - 1] \]

(0.0486)

+ 0.0300 \ast \Delta [\ln(PCINCu_{PRC} - 3 \ast POPr_{PRC} - 3 + PCINCu_{PRC} - 3 \ast POPu\%_{PRC} - 3 \ast 0.01)] / 

(0.0188)

(0.0486)

(VA3_{PRC} - 3 / VA3c_{PRC} - 3])

\[ VA3cECM_{PRC} = \ln(VA3c_{PRC}) - \ln([PCINCr_{PRC} \ast POPr_{PRC} + PCINCu_{PRC} \ast POPu\%_{PRC} \ast 0.01]) / 

(\text{VA3}_{PRC}/VA3c_{PRC}) + 0.35 \ast \ln([\text{VA1}_{PRC}/VA1c_{PRC}] / (VA3_{PRC}/VA3c_{PRC})) \]

VA3c_{PRC} = Value Added from the Tertiary Sector, in 1992Q1 Price
VA2_{PRC} = Value Added from the Secondary Sector
VA2c_{PRC} = Value Added from the Secondary Sector, in 1992Q1 Price
VA3_{PRC} = Value Added from the Tertiary Sector
VA1_{PRC} = Value Added from the Primary Sector
VA1c_{PRC} = Value Added from the Primary Sector, in 1992Q1 Price
PCINCr_{PRC} = Per Capita Income in Cash of Rural Household
POPr_{PRC} = Population, Rural
PCINCu_{PRC} = Per Capita Income of Urban Households
POPu\%_{PRC} = Urban Population over Total Population

Residual Diagnostics

sigma 0.0079
Joint Parameter constancy 1.5323

No autocorrelation F(3,30) = 1.1587 [0.3418]
No ARCH F(3,27) = 0.3660 [0.7781]
Normality Chi2^2(2) = 5.3315 [0.0695]
Homoscedasticity F(11,21) = 1.0275 [0.4577]
RESET F(1,32) = 4.0517 [0.0526]

Sample Period 1995(1) to 2004(4)

5.8 Gross National Product

\[ GNP_{PRC} = 1.0 \ast [1- SQ1 - SQ2 - SQ3] \ast [\text{GDP}_{PRC} + \text{GDP}_{PRC} - 1 + \text{GDP}_{PRC} - 2 + \text{GDP}_{PRC} - 3] + \text{NFIA}_{PRC} \]

GNP_{PRC} = Gross National Product
GDP_{PRC} = Gross Domestic Product
NFIA_{PRC} = Net Factor Income from Abroad

6. Price

6.1 Consumer Price Index

\[ \Delta \ln(P \# C_{PRC}) = -0.00197 + 0.00228 \ast SQ1 + 0.4096 \ast \Delta(P \# P_{PRC}) + 0.0523 \ast \Delta_2 \ln(WAGEu_{PRC}) \\
(0.00175) \quad (0.0030) \quad (0.0738) \quad (0.0050) \quad (0.0067) \\
+ 0.3128 \ast \Delta_2 \ln(P \# M_{PRC}) - 0.3128 \ast P \# EECM_{PRC} - 1 \]

(0.0127) \quad (0.0064) \quad (0.1052)
\[ P_{\text{CECM,PRC}} = \ln(P_{\text{C,PRC}}) - 0.85 \ln(P_{\text{P,PRC}}) - 0.15 \ln(P_{\text{M,PRC}}) + 0.2 \ln(GDPLR_{\text{PRC,2}}) \]

\[ P_{\text{C,PRC}} = \text{Consumer Price Index (1992Q1=1)} \]
\[ P_{\text{P,PRC}} = \text{Ex-Factory Price Index of Industrial Products (1992Q1=1)} \]
\[ WAGEu_{\text{PRC}} = \text{Average Earnings of Urban Employed Persons} \]
\[ P_{\text{M,PRC}} = \text{Import Price Index (1992Q1=1)} \]
\[ GDPLR_{\text{PRC}} = \text{Long-Run Supply Trend of GDP} \]
\[ GDP_{\text{PRC}} = \text{Gross Domestic Product} \]

\[ R^2 = 0.9280 \quad \text{joint parameter constancy} = 1.7284 \]

\[ \text{No autocorrelation} \quad F(3,34) = 1.2935 \quad [0.2924] \]
\[ \text{No ARCH} \quad F(3,31) = 0.2155 \quad [0.8849] \]
\[ \text{Normality} \quad \text{Chi}^2(2) = 5.9130 \quad [0.0520] \]
\[ \text{Homoscedasticity} \quad F(9,27) = 0.3486 \quad [0.9493] \]
\[ \text{X-Homoscedasticity} \quad F(19,17) = 0.6461 \quad [0.8216] \]
\[ \text{RESET} \quad F(1,36) = 3.3072 \quad [0.0773] \]

**Sample Period 1993(1) to 2003(3)**

### 6.2 Industrial Products Price Index

\[ \Delta \ln(P_{\text{P,PRC}}) = 0.5459 \ast \Delta \ln(P_{\text{P,PRC,1}}) + 0.02122 \ast \Delta \ln(P_{\text{INV,PRC}}) - 0.1178 \ast P_{\text{CECM,PRC,1}} \]

\[ R^2 = 0.569 \]

\[ \text{No autocorrelation} \quad F(3,28) = 1.11433 \quad [0.3488] \]
\[ \text{No ARCH} \quad F(3,25) = 0.1899 \quad [0.9023] \]
\[ \text{Normality} \quad \text{Chi}^2(2) = 0.5816 \quad [0.7477] \]
\[ \text{Homoscedasticity} \quad F(6,24) = 0.6822 \quad [0.6648] \]
\[ \text{RESET} \quad F(1,30) = 0.07782 \quad [0.7822] \]

**Sample Period 1995(2) to 2003(4)**
### 6.3 Export Price Index

\[ \Delta \ln(P_{#X_PRC}) = -0.0400 + 0.2379 \times \Delta \ln(P_{#M_PRC}) + 0.7550 \times \Delta \ln(P_{#P_PRC}) - 0.3498 \times \ln(P_{#XECM_PRC}) \]

\[
\begin{align*}
P_{#XECM_PRC} &= \ln(P_{#X_PRC}) - 0.7 \times \ln(P_{#M_PRC}) - 0.3 \times \ln(P_{#P_PRC}) - 0.45 \times DSH1998Q1 \\
P_{#X_PRC} &= \text{Export Price Index (1992Q1=1)} \\
P_{#M_PRC} &= \text{Import Price Index (1992Q1=1)} \\
P_{#P_PRC} &= \text{Ex-Factory Price Index of Industrial Products (1992Q1=1)}
\end{align*}
\]

#### Residual Diagnostics

<table>
<thead>
<tr>
<th>Name</th>
<th>Sigma</th>
<th>R²</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>No autocorrelation</td>
<td>F(3,35) = 0.6470 [0.5901]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No ARCH</td>
<td>F(3,32) = 0.6922 [0.5636]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normality</td>
<td>Chi^2(2) = 3.3971 [0.1829]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>F(6,31) = 0.5278 [0.7828]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-Homoscedasticity</td>
<td>F(9,28) = 1.4585 [0.2118]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESET</td>
<td>F(1,37) = 0.0819 [0.7763]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sample Period 1994(2) to 2004(3)

### 6.4 Import Price Index

\[ \Delta \ln(P_{#M_PRC}) = -0.4981 \times \Delta \ln(P_{#M_PRC}) - 0.0626 \times SQ1 + 0.0369 \times \Delta \ln(P_{#X_PRC}) + 0.6542 \times \Delta \ln(P_{#X_PRC}) \]

\[
\begin{align*}
P_{#XECM_PRC} &= \ln(P_{#X_PRC}) - 0.25 \times \ln(P_{#WX$*ER_PRC}) - 0.75 \times \ln(P_{#X_PRC}) + 0.2 \\
P_{#M_PRC} &= \text{Import Price Index (1992Q1=1)} \\
P_{#WXP} &= \text{Export Price Index (1992Q1=1)} \\
P_{#WX$} &= \text{World Export Price Index (1992Q1=1)}
\end{align*}
\]

#### Residual Diagnostics

<table>
<thead>
<tr>
<th>Name</th>
<th>Sigma</th>
<th>R²</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>No autocorrelation</td>
<td>F(3,31) = 1.7487 [0.1775]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No ARCH</td>
<td>F(3,28) = 0.7310 [0.5422]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normality</td>
<td>Chi^2(2) = 4.4354 [0.1089]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>F(11,22) = 2.0528 [0.0728]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESET</td>
<td>F(1,33) = 0.2997 [0.5878]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sample Period 1993(1) to 2002(4)
6.5 Investment Price Index

\[
\Delta^2 \ln[P#INV\_PRC] = 0.2308 \times \Delta^2 \ln[P#INV\_PRC] - 2 + 0.1522 + 0.0022 \times SQ1 \\
\times 0.03386 \\
0.02899 \\
0.0091 \\
0.0736 \\
0.0754 \\
+ 0.0043 \times \Delta^2 \ln(BINV\_PRC) - GINV\_PRC + 0.0606 \times [\Delta^2 (P#P\_PRC) - 1] - \Delta^2 (P#C\_PRC - 1) \\
\times 0.0020 \\
0.0383 \\
0.0115 \\
0.1235 \\
- 0.0032 \times \Delta^2 [IRL\%\_PRC] + 0.0465 \times \Delta[(BINV\_PRC - 1 + GINV\_PRC - 1) / GDP\_PRC - 1] \\
\times 0.0010 \\
0.0048 \\
0.1646 \\
0.0882 \\
+(BINVc\_PRC - 2 + GINV\_PRC - 2) / GDP\_PRC + (BINV\_PRC - 3 + GINV\_PRC - 3) / GDP\_PRC - 3 \\
+(BINV\_PRC - 4 + GINV\_PRC - 4) / GDP\_PRC - 4 - 0.4861 \times P#INVECM\_PRC - 2 \\
\times 0.0233 \\
0.0822 \\
\]

P#INVECM\_PRC = \ln(P#INV\_PRC) - 0.35 * \ln[0.25(VA2\_PRC/VA2c\_PRC + VA2\_PRC_1/VA2c\_PRC_1 + VA2\_PRC_2/VA2c\_PRC_2 + VA2\_PRC_3/VA2c\_PRC_3) - 0.05 * \ln(P#M\_PRC_1) + 0.003 * IRL\%\_PRC

P#INV\_PRC = Price index of investments in Fixed Assets (1992Q1=1)
P#M\_PRC = Import Price Index (1992Q1=1)
P#C\_PRC = Consumer Price Index (1992Q1=1)
BINV\_PRC = Business Sector Investment
GINV\_PRC = Government Budgetary Investment
P#P\_PRC = Ex-Factory Price index of Industrial Products (1992Q1=1)
P#C\_PRC = Consumer Price Index (1992Q1=1)
VA2\_PRC = Value Added from Secondary Sector
VA2c\_PRC = Value Added from Secondary Sector in 1992Q1 price
IRL\%\_PRC = One-year Interest Rate on Deposits (%)

Residual Diagnostics

\[\text{sigma} = 0.0029 \quad \quad \text{variance} = 0.1805 \quad \quad \text{R}^2 = 0.9915 \quad \quad \text{joint parameter constancy} = 1.2004\]

No autocorrelation \[F(3,31) = 2.0645 [0.1252]\]
No ARCH \[F(3,28) = 0.6056 [0.6169]\]
Normality test \[Chi^2(2) = 1.9081 [0.3852]\]
Homo.scedasticity \[F(13,20) = 0.48945 [0.9056]\]
RESET \[F(1,33) = 0.3151 [0.5783]\]
Sample Period 1993(3) to 2003(4)
6.6 GDP Deflator

\[ \Delta \ln (P \# GDP\_PRC) = -0.0027 + 0.0023 \cdot SQ2 + 1.01892 \cdot \Delta \ln \left( \frac{VA1\_PRC + VA2\_PRC + VA3\_PRC}{GDPc\_PRC} \right) \]

\[ \begin{bmatrix}
0.0004 & 0.0008 & 0.0065 \\
0.2530 & 0.0882 & 0.1008 \\
0.1357 & 0.5280 \\
\end{bmatrix} \]

\[ \begin{bmatrix}
0.16045 \\
\end{bmatrix} \]

\[ P\#GDPECM\_PRC = \ln (P\#GDP\_PRC) - \ln \left( \frac{VA1c\_PRC + VA2c\_PRC + VA3c\_PRC}{GDPc\_PRC} \right) \]

P\#GDPECM\_PRC = GDP Deflator (1992Q1=1)

VA1\_PRC = Value Added from the Primary Sector

VA2\_PRC = Value Added from the Secondary Sector

VA3\_PRC = Value Added from the Tertiary Sector

GDPc\_PRC = Gross Domestic Product in 1992Q1 Price

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>variance</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0017</td>
<td>0.2816</td>
<td>1.7739*</td>
</tr>
</tbody>
</table>

R\(^2\) = 0.9992

No autocorrelation

No ARCH

Normality test

Homoscedasticity

RESET

Sample Period 1994(4) to 2004(3)

6.7 Wages: Urban

\[ \Delta \ln (WAGEu\_PRC) = -0.3056 \cdot \Delta \ln (WAGEu\_PRC\_1) + 0.1130 - 0.5418 \cdot SQ1 - 0.4748 \cdot SQ2 - 0.3699 \cdot SQ3 \]

\[ \begin{bmatrix}
0.1364 & 0.0512 & 0.0613 & 0.0188 \\
0.2345 & 0.6877* & 0.2218 & 0.1821 \\
0.0124 & 0.0104 & 0.2717 & 0.2001 \\
\end{bmatrix} \]

\[ \begin{bmatrix}
0.0593 \cdot DST1999Q1 - 0.28266 \cdot WAGEuECM\_PRC\_1 \\
\end{bmatrix} \]

\[ WAGEuECM\_PRC = \ln (WAGEu\_PRC) - \ln \left( \frac{VA2\_PRC + VA3\_PRC}{EMP2\_PRC + EMP3\_PRC} \right) \]

WAGEu\_PRC = Average Earnings of Urban Employed Persons

VA2\_PRC = Value Added From the Secondary Sector

VA3\_PRC = Value Added From the Tertiary Sector

EMP2\_PRC = Number of Employed Persons in the Secondary Sector

EMP3\_PRC = Number of Employed Persons in the Tertiary Sector

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>variance</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0297</td>
<td>0.0433</td>
<td>1.6388</td>
</tr>
</tbody>
</table>

R\(^2\) = 0.9992

No autocorrelation

No ARCH

Normality

Homoscedasticity

RESET

Sample Period 1992(2) to 2003(3)
### 7. Monetary Sector

#### 7.1 M0

\[
\Delta \ln(M0_{PRC}) = 0.9593 \times \Delta \ln(M1_{PRC}) - 0.0866 \times SQ1 - 0.28425 \times M0ECM_{PRC,1} \\
(0.0828) \quad (0.0076) \quad (0.01718) 
\]

\[
M0ECM_{PRC} = \ln(M0_{PRC}) - \ln(0.59 - 0.08 \times \ln(TIME)) \times M1_{PRC,1} 
\]

- \( M0_{PRC} \) = Cash Issue
- \( M1_{PRC} \) = Narrow Money

#### 7.2 M1

\[
\Delta \ln(M1_{PRC}) = \Delta \ln(P\#GDP_{PRC}) + 0.20675 - 0.1900 \times SQ1 + 0.2300 \times SQ2 + 0.2689 \times \Delta \ln(GDPc_{PRC,1}) \\
(0.0622) \quad (0.0140) \quad (0.0365) \quad (0.0559) 
\]

\[
+ 0.1100 \times \Delta \left(\frac{MBS_{PRC,2}}{MB_{PRC,2}}\right) - 4.7700 \times \Delta \ln(P\#C_{PRC,1}) - 0.1634 \times M1ECM_{PRC,1} 
\]

\[
M1ECM_{PRC} = \ln(M1_{PRC}/P\#GDP_{PRC}) - \ln(GDPc_{PRC}) + 0.3 \times [IRDD\%_{PRC} - 100 \times \ln(P\#C_{PRC})] 
\]

- \( M1_{PRC} \) = Narrow Money
- \( P\#GDP_{PRC} \) = GDP Deflator
- \( GDPc_{PRC} \) = GDP, in 1992Q1 Price
- \( MBS_{PRC} \) = Base Money Supply
- \( MB_{PRC} \) = Base Money
- \( IRDD\%_{PRC} \) = Demand Deposit Interest Rate
- \( P\#C_{PRC} \) = Consumer Price Index (1992Q1=1)

#### Residual Diagnostics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residuals</td>
<td>Variance</td>
</tr>
<tr>
<td>Normality</td>
<td>Chi^2(2)</td>
</tr>
<tr>
<td>Homoskedasticity</td>
<td>F(10,26)</td>
</tr>
<tr>
<td>No autocorrelation</td>
<td>F(3,34)</td>
</tr>
<tr>
<td>No ARCH</td>
<td>F(3,31)</td>
</tr>
</tbody>
</table>

#### Stability

- Joint parameter constancy: 1.4399

Sample Period: 1994(1) to 2004(4)

#### 7.3 M2

\[
M2_{PRC} = M1_{PRC} + 2 \times M2_{PRC,1} - 2 \times M1_{PRC,1} - M2_{PRC,2} + M1_{PRC,2} - 172577 - 116978 \times SQ1 \\
24010 \quad 29520 
\]

\[
- 7541.42 \times \Delta^2(100 \times UEMP\%_{PRC,1}) - 173463 \times \Delta \ln(P\#C_{PRC,1}) + 26928.2 \times \Delta IRD\%_{PRC} \\
1585 \quad 759700 \quad 8229 
\]

\[
- 0.7933 \times M2ECM_{PRC,1} 
\]

- \( M2_{PRC} \) = M1_{PRC} + 2 \times M2_{PRC,1} - 2 \times M1_{PRC,1} - M2_{PRC,2} + M1_{PRC,2} - 172577 - 116978 \times SQ1
- \( M2_{PRC,1} \) = M1_{PRC,1} - M2_{PRC,1} + M1_{PRC,2} + M2_{PRC,2}
- \( M2ECM_{PRC,1} \) = M2_{PRC,1} - 172577 - 116978 \times SQ1
A SMALL MACROECONOMETRIC MODEL OF THE PEOPLE’S REPUBLIC OF CHINA
DUO QIN, MARIE ANNE CAGAS, GEOFFREY DUCANES, NEDELYN MAGTIBAY-RAMOS, XIN-HUA HE, RUI LIU, SHI-GUO LIU

\[ M2ECM\textsubscript{PRC} = \Delta(M2\textsubscript{PRC} - M1\textsubscript{PRC}) - 1.5*PSAV\textsubscript{PRC} - 13300*IRD\%\textsubscript{PRC} \]
\[ M2\textsubscript{PRC} = \text{Broad Money} \]
\[ M1\textsubscript{PRC} = \text{Narrow Money} \]
\[ UEMP\%\textsubscript{PRC} = \text{Unemployment Rate (\%)} \]
\[ P#C\textsubscript{PRC} = \text{Consumer Price Index (1992Q1=1)} \]
\[ IRD\%\textsubscript{PRC} = \text{One-Year Interest Rate on Deposits} \]
\[ PSAV\textsubscript{PRC} = \text{Potential Savings Deposit} \]

**Residual Diagnostics**

- **Sigma**: 79879.9
- **Variance**: 0.7482
- **R2**: 0.8503
- **Joint Parameter Constancy**: 1.9646
- **No Autocorrelation**: F(3,34) = 0.8149 [0.4946]
- **No ARCH**: F(3,31) = 0.7819 [0.5131]
- **Normality**: Chi^2(2) = 0.7778 [0.6778]
- **Homoscedasticity**: F(9,27) = 0.7238 [0.6833]
- **X-Homoscedasticity**: F(19,17) = 1.2210 [0.3419]
- **RESET**: F(1,36) = 1.4466 [0.2369]

**Sample Period**: 1993(3) to 2004(1)

### 7.4 Reserve Money

\[ RSV\textsubscript{PRC} = (M2\textsubscript{PRC} - M0\textsubscript{PRC}) * 0.01 * RR\%\textsubscript{PRC} + (RSV\textsubscript{PRC} - 1/(M2\textsubscript{PRC} - M0\textsubscript{PRC}) - 0.01 * RR\%\textsubscript{PRC}) + 0.172183 - 0.0226467*(SQ1 + SQ2 + SQ3) + 0.006276* \Delta\text{IRCB}%\textsubscript{PRC} - 0.719737* RSV\textsubscript{ECM} - 0.03 + 0.072183 - 0.000024 \]

- **RSVECM\textsubscript{PRC}**: \[ RSVECM\textsubscript{PRC} = [RSV\textsubscript{PRC}/(M2\textsubscript{PRC} - M0\textsubscript{PRC}) - 0.01*RR\%\textsubscript{PRC}] + 0.0055*IRL\%\textsubscript{PRC} + 0.074*(M1\textsubscript{PRC}/MB\textsubscript{PRC}) \]

**Residual Diagnostics**

- **Sigma**: 0.0066
- **Variance**: 0.1539
- **R2**: 0.8419
- **Joint Parameter Constancy**: 0.5285

**Sample Period**: 1993(3) to 2003(4)
7.5 Net Foreign Assets

\[ \Delta^2 \text{NFA}_\text{PRC} = -1189.50 \times 0.1 \times \Delta^2 Q2 + 0.725529 \times 0.001 \times \Delta (X_\text{PRC} - M_\text{PRC}) + 0.7990 \times 0.001 \times \Delta FDI_\text{PRC} \\
\begin{bmatrix}
249.10 & 0.3590 \\
0.2752 & 0.1724 \\
0.3921 & 0.0311 \\
\end{bmatrix}
\]

\[ -0.641666 \times \text{NFAECM}_\text{PRC}^2 \]

\[ \text{NFAECM}_\text{PRC} = r\text{NFA}_\text{PRC} - X_\text{PRC}/1000 + M_\text{PRC}/1000 - FDI_\text{PRC}/1000 - 250/10 \]

\[ \text{NFA}_\text{PRC} = \text{Net Foreign Assets} \]
\[ X_\text{PRC} = \text{Exports} \]
\[ M_\text{PRC} = \text{Imports} \]
\[ FDI_\text{PRC} = \text{Foreign Direct Investments} \]

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>612.84</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>—</td>
</tr>
</tbody>
</table>

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>0.0170</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.6260</td>
</tr>
</tbody>
</table>

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>0.0170</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.6260</td>
</tr>
</tbody>
</table>

7.6 Domestic Credit

\[ \Delta \ln(DC_\text{PRC}) = -0.029 + 0.6258 \times \Delta \ln(M2_\text{PRC}/1000 + NFA_\text{PRC} - FD_\text{PRC}) + 0.1462 \times DSH2002Q1 \\
\begin{bmatrix}
0.1337 \\
0.0201 \\
\end{bmatrix} \\
\]

\[ -0.1733 \times \text{DCECM}_\text{PRC} - 1 \]

\[ \text{DCECM}_\text{PRC} = \ln(DC_\text{PRC}) - \ln(M2_\text{PRC}/1000 + NFA_\text{PRC} - FD_\text{PRC}) \]

\[ \text{DC}_\text{PRC} = \text{Domestic Credit} \]
\[ M2_\text{PRC} = \text{Broad Money} \]
\[ \text{NFA}_\text{PRC} = \text{Net Foreign Assets} \]
\[ \text{FD}_\text{PRC} = \text{Foreign Debt} \]

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>0.0170</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.6260</td>
</tr>
</tbody>
</table>

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>0.0170</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.6260</td>
</tr>
</tbody>
</table>

Residual Diagnostics

<table>
<thead>
<tr>
<th>sigma</th>
<th>0.0170</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>0.6260</td>
</tr>
</tbody>
</table>

Sample Period 1993(2) to 2003(3)
7.7 Base Money Supply

\[
\text{MBS}_{PRC} = \text{MB}_{PRC} * \text{MSP}_{PRC} * \left[ 0.5573 \times \left( \frac{\text{MBS}_{PRC} - 1 - \text{MB}_{PRC} - 1}{\text{MB}_{PRC} - 1} \right) + 1.0965 \right] \\
\frac{0.1440}{0.1545} \times \frac{0.1628}{0.0760} - 0.2242 \times \Delta \ln(P\#C_{PRC} - 3)
\]

- Base Money Supply
- Base Money
- Money Supply Policy
- Consumer Price Index (1992Q1=1)

Residual Diagnostics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\sigma)</td>
<td>0.0266</td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.7660</td>
<td></td>
</tr>
<tr>
<td>No autocorrelation</td>
<td>(F(3,32) = 1.2208 [0.3181])</td>
<td></td>
</tr>
<tr>
<td>No ARCH</td>
<td>(F(3,29) = 0.1634 [0.9201])</td>
<td></td>
</tr>
<tr>
<td>Normality</td>
<td>(\text{Chi}^2(2) = 5.7741 [0.0557])</td>
<td></td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>(F(5,29) = 0.7931 [0.5634])</td>
<td></td>
</tr>
</tbody>
</table>

7.8 Interest Rate on Demand Deposits

\[
\Delta \text{IRDD}\%_{PRC} = 0.18515 - 1.1400 \times \Delta \ln((\text{M2}_{PRC} - 2 - \text{M1}_{PRC} - 2) / \text{M1}_{PRC} - 2) - 0.25826 \times \text{IRDD}\%_{ECM_{PRC}} - 0.05 \times \text{IRCB}\%_{PRC} - 9 \times r_1 \ln(P\#C_{PRC} - 2)
\]

- Interest Rate on Demand Deposits
- Central Bank Rediscount Rate
- Broad Money
- Narrow Money
- Consumer Price Index (1992Q1=1)

Residual Diagnostics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\sigma)</td>
<td>0.1022</td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.4951</td>
<td></td>
</tr>
<tr>
<td>No autocorrelation</td>
<td>(F(3,32) = 0.8551 [0.4743])</td>
<td></td>
</tr>
<tr>
<td>No ARCH</td>
<td>(F(3,29) = 0.0704 [0.9753])</td>
<td></td>
</tr>
<tr>
<td>Normality</td>
<td>(\text{Chi}^2(2) = 14.476 [0.0007]) **</td>
<td></td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>(F(4,30) = 1.0739 [0.3868])</td>
<td></td>
</tr>
<tr>
<td>X-Homoscedasticity</td>
<td>(F(5,29) = 0.9018 [0.4932])</td>
<td></td>
</tr>
<tr>
<td>RESET</td>
<td>(F(1,34) = 10.686 [0.0025]) **</td>
<td></td>
</tr>
</tbody>
</table>

Sample Period 1994(4) to 2004(1)
7.9 One-year Interest Rate on Deposits

\[
\Delta(\text{IRD\%}_\text{PRC}) = 0.5517 + 2.277 \cdot \Delta(\text{IRD\%}_\text{PRC}) + 1.0550 \cdot \Delta(\text{P}\#C\_\text{PRC}) + 0.0970 \cdot \Delta(\text{RR\%}_\text{PRC}_2) \\
- 0.2230 \cdot (\text{IRD\%}_\text{PRC}_1 / \text{IRD\%}_\text{PRC}_2)
\]

\[
\begin{bmatrix}
0.2216 \\
0.0288
\end{bmatrix}
\begin{bmatrix}
0.0679 \\
0.0534
\end{bmatrix}
\]

IRD\%\_PRC = One-Year Interest Rate on Deposits
IRD\%\_PRC = Interest Rate on Demand Deposits
P\#C\_PRC = Consumer Price Index (1992Q1=1)
M1\_PRC = Narrow Money

Residual Diagnostics

sigma 0.2225
R^2 0.7284
No autocorrelation F(3,32) = 2.3658 [0.0894]
No ARCH F(3,29) = 0.2731 [0.5686]
Normality Chi^2(2) = 12.602 [0.0018]**
Homoscedasticity F(3,29) = 2.0756 [0.0762]
RESET F(1,34) = 4.9420 [0.0330]*
Sample Period 1994(1) to 2003(4)

7.10 One-year Interest Rate on Lending

\[
\Delta(\text{IRL\%}_\text{PRC}) = 0.6200 \cdot \Delta(\text{IRD\%}_\text{PRC}) - 0.2510 \cdot \Delta(\text{ECM\_PRC}_1)
\]

\[
\begin{bmatrix}
0.0919 \\
0.0932
\end{bmatrix}
\begin{bmatrix}
0.0833 \\
0.1068
\end{bmatrix}
\]

IRL\%\_PRC = IRL\%\_PRC - 0.75*IRD\%\_PRC - 4
IRL\%\_PRC = One-Year Interest Rate on Lending
IRD\%\_PRC = Interest Rate on Deposits

Residual Diagnostics

sigma 0.2258
R^2 0.6507
No autocorrelation F(3,29) = 2.3658 [0.0894]
No ARCH F(3,29) = 0.2731 [0.5686]
Normality Chi^2(2) = 12.602 [0.0018]**
Homoscedasticity F(3,29) = 2.0756 [0.0762]
RESET F(1,34) = 4.9420 [0.0330]*
Sample Period 1995(1) to 2003(3)

8. Labour and Employment

8.1 Labour Force/Supply

\[
\Delta_4 \ln(\text{LF\_PRC}) = 0.5840 \cdot \Delta_4 \ln(\text{LF\_PRC}_1) + 0.263117 - 0.7800 \cdot \text{LFECM\_PRC}_4
\]

\[
\begin{bmatrix}
0.0707 \\
0.0886
\end{bmatrix}
\begin{bmatrix}
0.216 \\
0.2243
\end{bmatrix}
\]

\[
\begin{bmatrix}
0.0594 \\
0.1186
\end{bmatrix}
\begin{bmatrix}
0.2247 \\
0.2243
\end{bmatrix}
\]

LFECM\_PRC = ln(LF\_PRC) - 0.9*ln(Pop\_PRC) + 0.36*(Popr\_PRC/Pop\_PRC)
8.2 Employment

\[ \Delta \ln(\text{EMP}_{\text{PRC}}) = 0.6244 \times \Delta \ln(\text{EMP}_{\text{PRC}}) + 0.13817 - 0.035464 \times \text{EMP}_{\text{ECM,PRC}} \]

\[ \text{EMP}_{\text{ECM,PRC}} = \ln(\text{EMP}_{\text{PRC}}) - 0.2 \times \ln(\text{GDP}c_{\text{PRC}} + \text{GDP}c_{\text{PRC}} + \text{GDP}c_{\text{PRC}} + \text{GDP}c_{\text{PRC}}) + 0.043 \times \ln(\text{WAGEu}_{\text{PRC}} + \text{WAGEu}_{\text{PRC}} + \text{WAGEu}_{\text{PRC}} + \text{WAGEu}_{\text{PRC}}) \]

8.3 Secondary Sector Employment

\[ \Delta \ln(\text{EMP2}_{\text{PRC}}) = 0.8199 \times \Delta \ln(\text{EMP2}_{\text{PRC}}) + 0.1595 + 0.0096 \times \text{DSH2003Q1} - 0.01156 \times \Delta^2(\text{UEMP\%}_{\text{PRC}}) \]

\[ + \ln(\text{WAGE}_{\text{PRC}} - \text{VA}_2c_{\text{PRC}} - \text{VA}_2c_{\text{PRC}} - \text{VA}_2c_{\text{PRC}}) \]

\[ + \ln(\text{WAGE}_{\text{PRC}} - \text{VA}_2c_{\text{PRC}} - \text{VA}_2c_{\text{PRC}} - \text{VA}_2c_{\text{PRC}}) - 0.08836 \times \text{EMP2ECM}_{\text{PRC}} \]

\[ \text{EMP2ECM}_{\text{PRC}} = \ln(\text{EMP2}_{\text{PRC}}) - \ln(\text{VA}_2c_{\text{PRC}} + \text{VA}_2c_{\text{PRC}} + \text{VA}_2c_{\text{PRC}} + \text{VA}_2c_{\text{PRC}}) \]
Residual Diagnostics

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>sigma</td>
<td>0.0016</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.9148</td>
<td></td>
</tr>
<tr>
<td>No autocorrelation</td>
<td>F(3,29) = 0.0165 [0.9970]</td>
<td></td>
</tr>
<tr>
<td>No ARCH</td>
<td>F(3,26) = 0.4812 [0.6982]</td>
<td></td>
</tr>
<tr>
<td>Normality</td>
<td>C<strong>2(2) = 16.970 [0.0002]</strong></td>
<td></td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>F(9,22) = 1.2199 [0.3327]</td>
<td></td>
</tr>
<tr>
<td>RESET</td>
<td>F(1,31) = 0.2353 [0.6310]</td>
<td></td>
</tr>
</tbody>
</table>

Sample Period 1994(3) to 2003(4)

8.4 Tertiary Sector Employment

\[
\Delta \ln(EMP_{3\_PRC}) = 0.092887 + 0.0049^* DS{\text{H}}2002Q1 - 0.552527^* \Delta \ln(EMP_{1\_PRC} - 1 - EMP_{3\_PRC} - 1)
\]

\[
+ 0.01778^* \Delta^2 \ln(\frac{VA_{3\_PRC}/VA_{3c\_PRC}}{VA_{2\_PRC}/VA_{2c\_PRC}}) - 0.0294^* EMP_{3ECM\_PRC} - 1
\]

\[
B84
\]

\[
EMP_{3ECM\_PRC} = \ln(EMP_{3\_PRC}) - \ln(\frac{VA_{3\_PRC}/VA_{3c\_PRC}}{VA_{2\_PRC}/VA_{2c\_PRC}}) + 0.15^* \ln(VA_{3c\_PRC} + VA_{3c\_PRC_2} + VA_{3c\_PRC_3} + VA_{3c\_PRC_4})
\]

\[
EMP_{3\_PRC} = \text{Number of Employed Persons in the Tertiary Sector}
\]

\[
EMP_{1\_PRC} = \text{Number of Employed Persons in the Primary Sector}
\]

\[
VA_{3\_PRC} = \text{Value Added from the Tertiary Sector}
\]

\[
VA_{3c\_PRC} = \text{Value Added from the Tertiary Sector in 1992Q1 Price}
\]

\[
VA_{2\_PRC} = \text{Value Added from the Secondary Sector}
\]

\[
VA_{2c\_PRC} = \text{Value Added from the Secondary Sector in 1992Q1 Price}
\]

Residual Diagnostics

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>sigma</td>
<td>0.0011</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.9732</td>
<td></td>
</tr>
<tr>
<td>No autocorrelation</td>
<td>F(3,32) = 0.9338 [0.4357]</td>
<td></td>
</tr>
<tr>
<td>No ARCH</td>
<td>F(3,29) = 0.1876 [0.9041]</td>
<td></td>
</tr>
<tr>
<td>Normality</td>
<td>C**2(2) = 5.0918 [0.0784]</td>
<td></td>
</tr>
<tr>
<td>Homoscedasticity</td>
<td>F(7,27) = 1.7163 [0.1473]</td>
<td></td>
</tr>
<tr>
<td>X-Homoscedasticity</td>
<td>F(10,24) = 1.4165 [0.2322]</td>
<td></td>
</tr>
<tr>
<td>RESET</td>
<td>F(1,34) = 0.3040 [0.5850]</td>
<td></td>
</tr>
</tbody>
</table>

Sample Period 1994(1) to 2003(4)

Note: All variables are named by their English abbreviation. Special letters and characters used and added to variable names denote the following: $ - US$; c - at constant price; PC as the first 2 letters of a variable means per capita; u means urban; r means rural. When the variable name is Y, ln(Y) means the logarithm of Y, Y_1 means the first lag of Y, \( \Delta Y \) means the first difference of Y, i.e., \( \Delta Y = Y - Y_1 \), \( \Delta \ln(Y) \) means first take the logarithm and then take the first difference, i.e., \( \Delta \ln(Y) = \ln(Y) - \ln(Y_1) \); YECM means the long run equilibrium in the behavior equation, where Y is the explained variable. SQ1, SQ2, and SQ3 are seasonal dummies. DS{\text{H}}YYYYQX denotes a one-off (shock) dummy in quarter (Q) X of year YYYY. DS{\text{T}}YYYYQX denotes a one-step dummy from quarter (Q) X of year YYYY onwards. DS{\text{T}}YYYYQX denotes a one-step dummy from quarter (Q) X of year YYYY onwards.
**APPENDIX 2B
IDENTITIES**

### Investment

<table>
<thead>
<tr>
<th>Equation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$INVc_{PRC} = \frac{INV_{PRC}}{P#INV_{PRC}}$</td>
<td>$INVc_{PRC} = \text{Fixed Capital Formation, in 1992Q1 price}$; $INV_{PRC} = \text{Gross Fixed Capital Formation}$; $P#INV_{PRC} = \text{Fixed Investment Price Index (1992Q1=1)}$</td>
</tr>
<tr>
<td>$UCC%<em>{PRC} = \frac{(P#INV</em>{PRC}/P#GDP_{PRC})<em>[IRL%_{PRC}/4 - 100</em>(P#INV_{PRC}/P#INV_{PRC}_4 - 1) + DEPK%<em>{PRC}]*/(1 - TAX%</em>{PRC}/100)}{(1 - TAX%_{PRC}/100)}$</td>
<td>$UCC%<em>{PRC} = \text{User Cost of Capital}$; $P#INV</em>{PRC} = \text{Price Index of Investment in Fixed Assets (1992Q1=1)}$; $P#GDP_{PRC} = \text{GDP Deflator}$; $IRL%<em>{PRC} = \text{One Year Interest Rate of Lending}$; $DEPK%</em>{PRC} = \text{Annual Depreciation Rate of Fixed Assets (%)}$; $TAX%_{PRC} = \text{Tax Rate}$</td>
</tr>
<tr>
<td>$K_{PRC} = K_{PRC}(–1)*(1–DEPK_{PRC}/400)+INV_{PRC}$</td>
<td>$K_{PRC} = \text{Stock of Fixed Investment Assets}$; $DEPK_{PRC} = \text{Annual Depreciation Rate of Fixed Assets (%)}$; $INV_{PRC} = \text{Gross Fixed Capital Formation}$</td>
</tr>
<tr>
<td>$BINV_{PRC} = BINVc_{PRC}*P#INV_{PRC}$</td>
<td>$BINV_{PRC} = \text{Business Sector Investment}$; $BINVc_{PRC} = \text{Business Sector Investment, 1992Q1 price}$; $P#INV_{PRC} = \text{Price Index of Investment in Fixed Assets (1992Q1=1)}$</td>
</tr>
<tr>
<td>$GINV_{PRC} = GINVc_{PRC}*P#INV_{PRC}$</td>
<td>$GINV_{PRC} = \text{Government Budgetary Investment}$; $GINVc_{PRC} = \text{Government Investment}$; $P#INV_{PRC} = \text{Price Index of Investment in Fixed Assets (1992Q1=1)}$</td>
</tr>
<tr>
<td>$FDI_{PRC} = FDIS_{PRC}*ER_{PRC}$</td>
<td>$FDI_{PRC} = \text{Foreign Direct Investments}$; $FDIS_{PRC} = \text{Foreign Direct Investments (100 million US$)}$; $ER_{PRC} = \text{Exchange Rate}$</td>
</tr>
<tr>
<td>$INVc_{PRC} = \frac{INV_{PRC}}{P#INV_{PRC}}$</td>
<td>$INVc_{PRC} = \text{Fixed Capital Formation, in 1992Q1 price}$; $INV_{PRC} = \text{Gross Fixed Capital Formation}$; $P#INV_{PRC} = \text{Price Index of Investment in Fixed Assets (1992Q1=1)}$</td>
</tr>
</tbody>
</table>

### Government Sector

<table>
<thead>
<tr>
<th>Equation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$GDEF_{PRC} = GREV_{PRC} - GEXP_{PRC}$</td>
<td>$GDEF_{PRC} = \text{Government Deficit}$; $GREV_{PRC} = \text{Government Revenue}$; $GEXP_{PRC} = \text{Government Expenditure}$</td>
</tr>
</tbody>
</table>
### Exports and Imports

\[
X_{PRC} = X$_{PRC}$*$ER_{PRC} \tag{I301}
\]
\[
X_{PRC} = \text{Export} \\
X$_{PRC} = \text{Export} \tag{B41} \\
ER_{PRC} = \text{Exchange Rate} \\
ER_{PRC} = \text{Exchange Rate Exogenous}
\]

\[
M_{PRC} = M$_{PRC}$*$ER_{PRC} \tag{I302}
\]
\[
M_{PRC} = \text{Imports} \\
M$_{PRC} = \text{Imports} \tag{B42} \\
ER_{PRC} = \text{Exchange Rate} \\
ER_{PRC} = \text{Exchange Rate Exogenous}
\]

### The GDPs

\[
\text{GDPc}_{PRC} = \text{VA1c}_{PRC} + \text{VA2c}_{PRC} + \text{VA3c}_{PRC} \tag{I401}
\]
\[
\text{GDPc}_{PRC} = \text{Gross Domestic Product, in 1992Q1 price} \\
\text{VA1c}_{PRC} = \text{Value Added from the Primary Sector, in 1992Q1 price} \tag{B52} \\
\text{VA2c}_{PRC} = \text{Value Added from the Secondary Sector, in 1992Q1 price} \tag{B54} \\
\text{VA3c}_{PRC} = \text{Value Added from the Tertiary Sector, in 1992Q1 price} \tag{B56}
\]

\[
\text{GDP}_{PRC} = \text{GDPc}_{PRC}$*$P#GDP_{PRC} \tag{I402}
\]
\[
\text{GDP}_{PRC} = \text{Gross Domestic Product} \\
\text{VA1}_{PRC} = \text{Value Added from the Primary Sector} \tag{B51} \\
\text{VA2}_{PRC} = \text{Value Added from the Secondary Sector} \tag{B53} \\
\text{VA3}_{PRC} = \text{Value Added from the Tertiary Sector} \tag{B55}
\]

\[
\text{GDPe}_{PRC} = \text{PCON}_{PRC} + \text{INV}_{PRC} + \text{GCON}_{PRC} + X_{PRC} – M_{PRC} \tag{I403}
\]
\[
\text{GDPe}_{PRC} = \text{Effective Domestic Demand} \\
\text{PCON}_{PRC} = \text{Private Consumption} \tag{T11} \\
\text{INV}_{PRC} = \text{Investment in Fixed Assets} \tag{T21} \\
\text{GCON}_{PRC} = \text{Government Consumption} \tag{B32} \\
X_{PRC} = \text{Exports} \tag{I301} \\
M_{PRC} = \text{Imports} \tag{I302}
\]

\[
\text{GDP$_{PRC}$} = \text{GDP}_{PRC}$*$ER_{PRC} \tag{I404}
\]
\[
\text{GDP$_{PRC}$} = \text{Gross Domestic Product} \\
\text{GDP}_{PRC} = \text{Gross Domestic Product} \tag{I402} \\
ER_{PRC} = \text{Exchange Rate} \\
ER_{PRC} = \text{Exchange Rate Exogenous}
\]

\[
\text{PCGDP}_{PRC} = \text{GDP}_{PRC}/\text{POP}_{PRC} \tag{I405}
\]
\[
\text{PCGDP}_{PRC} = \text{Per Capita Gross Domestic Product} \\
\text{GDP}_{PRC} = \text{GDP}_{PRC} \tag{I402} \\
\text{POP}_{PRC} = \text{Total Population} \\
\text{POP}_{PRC} = \text{Total Population} \tag{Exogenous}
\]

\[
\text{PCONc}_{PRC} = \text{PCON}_{PRC}/P#C_{PRC} \tag{I406}
\]
\[
\text{PCONc}_{PRC} = \text{Private Consumption, in 1992Q1 price} \tag{T11} \\
\text{GCONc}_{PRC} = \text{Government Consumption, in 1992Q1 price} \tag{B32} \\
P#C_{PRC} = \text{Consumer Price Index (1992Q1=1)} \tag{B61}
\[ \text{GCONc\textsubscript{PRC}} = \frac{\text{GCON\textsubscript{PRC}}}{P\#C\textsubscript{PRC}} \quad (\text{I407}) \]

\text{GCONc\textsubscript{PRC}} = Government Consumption, in 1992Q1 price
\text{GCON\textsubscript{PRC}} = Government Consumption (B32)
P\#C\textsubscript{PRC} = Consumer Price Index (1992Q1=1) (B61)

\[ \text{Xc\textsubscript{PRC}} = \frac{\text{X\textsubscript{PRC}}}{P\#C\textsubscript{PRC}} \quad (\text{I408}) \]

\text{Xc\textsubscript{PRC}} = Exports, in 1992Q1 price
\text{X\textsubscript{PRC}} = Exports (I301)
P\#C\textsubscript{PRC} = Consumer Price Index (1992Q1=1) (B61)

\[ \text{Mc\textsubscript{PRC}} = \frac{\text{M\textsubscript{PRC}}}{P\#C\textsubscript{PRC}} \quad (\text{I409}) \]

\text{Mc\textsubscript{PRC}} = Imports, in 1992Q1 price
\text{M\textsubscript{PRC}} = Imports (I302)
P\#C\textsubscript{PRC} = Consumer Price Index (1992Q1=1) (B61)

\[ \text{STK\textsubscript{PRC}} = \text{GDP\textsubscript{PRC}} - \text{GDPe\textsubscript{PRC}} \quad (\text{I410}) \]

\text{STK\textsubscript{PRC}} = Inventories
\text{GDP\textsubscript{PRC}} = Gross Domestic Product (I402)
\text{GDPe\textsubscript{PRC}} = Effective Domestic Demand (I403)

\[ \text{STKc\textsubscript{PRC}} = \text{GDPc\textsubscript{PRC}} - (\text{PCONc\textsubscript{PRC}} + \text{INVc\textsubscript{PRC}} + \text{GCONc\textsubscript{PRC}} + \text{Xc\textsubscript{PRC}} - \text{Mc\textsubscript{PRC}}) \quad (\text{I411}) \]

\text{STKc\textsubscript{PRC}} = Inventories, in 1992Q1 price
\text{GDPc\textsubscript{PRC}} = Gross Domestic Product, in 1992Q1 Price (I401)
\text{PCONc\textsubscript{PRC}} = Private Consumption, in 1992Q1 Price (T11)
\text{INVc\textsubscript{PRC}} = Investment in Fixed Assets, in 1992Q1 Price (I406)
\text{GCONc\textsubscript{PRC}} = Government Consumption, in 1992Q1 Price (I101)
\text{Xc\textsubscript{PRC}} = Exports, in 1992Q1 Price (I408)
\text{Mc\textsubscript{PRC}} = Imports, in 1992Q1 Price (I409)

\[ \text{PSAV\textsubscript{PRC}} = (\text{PCINCu\textsubscript{PRC}} - \text{PCCONu\textsubscript{PRC}})\times \frac{\text{POPu\textsubscript{PRC}}}{10000} + (\text{PCINCr\textsubscript{PRC}} - \text{PCCONr\textsubscript{PRC}})\times \frac{\text{POPr\textsubscript{PRC}}}{10000} \quad (\text{I601}) \]

\text{PSAV\textsubscript{PRC}} = Potential Savings Deposit
\text{PCINCu\textsubscript{PRC}} = Per Capita Income of Urban Households (B12)
\text{PCCONu\textsubscript{PRC}} = Per Capita Living Expenditure of Urban Households in Cash (B14)
\text{POPu\textsubscript{PRC}} = Population, Urban (I801)
\text{PCINCr\textsubscript{PRC}} = Per Capita Income in Cash of Rural Household (B13)
\text{POPr\textsubscript{PRC}} = Population, Rural (I802)

\[ \text{MB\textsubscript{PRC}} = \text{MO\textsubscript{PRC}} + \text{RSV\textsubscript{PRC}} \quad (\text{I602}) \]

\text{MB\textsubscript{PRC}} = Base Money
\text{MO\textsubscript{PRC}} = Currency in Issue (T71)
\text{RSV\textsubscript{PRC}} = Foreign Reserves (B73)
Labor/Employment

\[
\text{UEMP\%}_{\text{PRC}} = 100 \times \left(1 - \frac{\text{EMP\_PRC}}{\text{LF\_PRC}}\right) \quad (\text{I701})
\]

- **UEMP\%_{\text{PRC}}** = Unemployment Rate
- **EMP\_PRC** = Total Number of Employed Persons
- **LF\_PRC** = Labor Force

\[
\text{EMP1\_PRC} = \text{EMP\_PRC} - (\text{EMP2\_PRC} + \text{EMP3\_PRC}) \quad (\text{I702})
\]

- **EMP1\_PRC** = Total Number of Employed Persons in the Primary Sector
- **EMP\_PRC** = Total Number of Employed Persons
- **EMP2\_PRC** = Total Number of Employed Persons in the Secondary Sector
- **EMP3\_PRC** = Total Number of Employed Persons in the Tertiary Sector
REFERENCES


Polak, J. J. 1957. Monetary Analysis of Income Formation and Payments Problems. IMF Staff Papers 6, International Monetary Fund, Washington, DC.


PUBLICATIONS FROM THE ECONOMICS AND RESEARCH DEPARTMENT

ERD WORKING PAPER SERIES (WPS)
(Published in-house; Available through ADB Office of External Relations; Free of Charge)

No. 1 Capitalizing on Globalization
—Barry Eichengreen, January 2002

No. 2 Policy-based Lending and Poverty Reduction: An Overview of Processes, Assessment and Options
—Richard Bolt and Manabu Fujimura, January 2002

No. 3 The Automotive Supply Chain: Global Trends and Asian Perspectives
—Francisco Veloso and Rajiv Kumar, January 2002

No. 4 Internationalization of Asian Firms: An Analytical Framework
—Rajiv Kumar and Doren Chadee, February 2002

No. 5 The International Competitiveness of Asian Economies in the Apparel Commodity Chain
—Gary Gereffi, February 2002

No. 6 Monetary and Financial Cooperation in East Asia—The Chiang Mai Initiative and Beyond
—Pradumna B. Rana, February 2002

No. 7 Probing Beneath Cross-national Averages: Poverty, Inequality, and Growth in the Philippines
—Arsenio M. Balisacan and Ernesto M. Pernia, March 2002

No. 8 Poverty, Growth, and Inequality in Thailand
—Anil B. Deolalikar, April 2002

No. 9 Microfinance in Northeast Thailand: Who Benefits and How Much?
—Brett E. Coleman, April 2002

No. 10 Poverty Reduction and the Role of Institutions in Developing Asia
—Anil B. Deolalikar, Alex B. Brillantes, Jr., Raghav Gaiha, Ernesto M. Pernia, and Abuzar Asra, May 2002

No. 11 The European Social Model: Lessons for Developing Countries
—Assar Lindbeck, May 2002

No. 12 Costs and Benefits of a Common Currency for ASEAN
—Srinivasa Madhur, May 2002

No. 13 Monetary Cooperation in East Asia: A Survey
—Raul Fabela, May 2002

No. 14 Toward A Political Economy Approach to Policy-based Lending
—George Abonyi, May 2002

No. 15 A Framework for Establishing Priorities in a Country Poverty Reduction Strategy
—Ron Duncan and Steve Pollard, June 2002

No. 16 The Role of Infrastructure in Land-use Dynamics and Rice Production in Viet Nam’s Mekong River Delta
—Christopher Edmonds, July 2002

No. 17 Effect of Decentralization Strategy on Macroeconomic Stability in Thailand
—Kanokpan Lao-Araya, August 2002

No. 18 Poverty and Patterns of Growth
—Rana Hasan and M. G. Quibria, August 2002

No. 19 Why are Some Countries Richer than Others? A Reassessment of Mankiw-Romer-Weil’s Test of the Neoclassical Growth Model
—Jesus Felipe and John McCombie, August 2002

No. 20 Modernization and Son Preference in People’s Republic of China
—Robin Burgess and Juzhong Zhuang, September 2002

No. 21 The Doha Agenda and Development: A View from the Uruguay Round
—J. Michael Finger, September 2002

No. 22 Conceptual Issues in the Role of Education Decentralization in Promoting Effective Schooling in Asian Developing Countries
—Jere R. Behrman, Anil B. Deolalikar, and Lee-Ying Son, September 2002

No. 23 Promoting Effective Schooling through Education Decentralization in Bangladesh, Indonesia, and Philippines
—Jere R. Behrman, Anil B. Deolalikar, and Lee-Ying Son, September 2002

No. 24 Financial Opening under the WTO Agreement in Selected Asian Countries: Progress and Issues
—Yun-Hwan Kim, September 2002

No. 25 Revisiting Growth and Poverty Reduction in Indonesia: What Do Subnational Data Show?
—Arsenio M. Balisacan, Ernesto M. Pernia, and Abuzar Asra, October 2002

No. 26 Causes of the 1997 Asian Financial Crisis: What Can an Early Warning System Model Tell Us?
—Juzhong Zhuang and J. Malcolm Dowling, October 2002

No. 27 Digital Divide: Determinants and Policies with Special Reference to Asia

No. 28 Regional Cooperation in Asia: Long-term Progress, Recent Retrogression, and the Way Forward
—Rangopal Agarwala and Brahm Prakash, October 2002

No. 29 How can Cambodia, Lao PDR, Myanmar, and Viet Nam Cope with Revenue Lost Due to AFTA Tariff Reductions?
—Kanokpan Lao-Araya, November 2002

No. 30 Asian Regionalism and Its Effects on Trade in the 1980s and 1990s
—Ramon Clarete, Christopher Edmonds, and Jessica Seddon Wallack, November 2002

No. 31 New Economy and the Effects of Industrial Structures on International Equity Market Correlations
—Cyn-Young Park and Juzhong Zhuang, December 2002

No. 32 Leading Indicators of Business Cycles in Malaysia and the Philippines
—Wenda Zhang and Juzhong Zhuang, December 2002

No. 33 Technological Spillovers from Foreign Direct Investment—A Survey
—Emma Xiaogin Fan, December 2002
No. 74  Growth and Trade Horizons for Asia: Long-term Forecasts for Regional Integration
—David Roland-Holst, Jean-Pierre Verbiest, and Fan Zhai, November 2005

No. 75  Macroeconomic Impact of HIV/AIDS in the Asian and Pacific Region
—Ajay Tendulkar, November 2005

No. 76  Policy Reform in Indonesia and the Asian Development Bank’s Financial Sector Governance Reforms Program Loan
—George Abonyi, December 2005

No. 77  Dynamics of Manufacturing Competitiveness in South Asia: Analysis through Export Data
—Hans-Peter Brunner and Massimiliano Calì, December 2005

No. 78  Trade Facilitation
—Teruo Ujiie, January 2006

No. 79  An Assessment of Cross-country Fiscal Consolidation
—Bruno Carrasco and Seung Mo Choi, February 2006

No. 80  Central Asia: Mapping Future Prospects to 2015
—Malcolm Dowling and Ganeshan Wignaraja, April 2006

No. 81  A Small Macroeconometric Model of the People’s Republic of China
—Duo Qin, Marie Anne Cagas, Geoffrey Ducanes, Neldyn Magtibay-Ramos, Pilipinas Quising, Xin-Hua He, Rui Liu, and Shi-Guo Liu, May 2006
ERD POLICY BRIEF SERIES (PBS)
(Published in-house; Available through ADB Office of External Relations; Free of charge)

No. 1 Is Growth Good Enough for the Poor?
—Ernesto M. Pernia, October 2001

No. 2 India’s Economic Reforms
What Has Been Accomplished?
What Remains to Be Done?
—Arvind Panagariya, November 2001

No. 3 Unequal Benefits of Growth in Viet Nam
—Indu Bhushan, Erik Bloom, and Nguyen Minh Thang, January 2002

No. 4 Is Volatility Built into Today’s World Economy?
—J. Malcolm Dowling and J.P. Verbiest, February 2002

No. 5 What Else Besides Growth Matters to Poverty Reduction? Philippines
—Arsenio M. Balisacan and Ernesto M. Pernia, February 2002

No. 6 Achieving the Twin Objectives of Efficiency and Equity: Contracting Health Services in Cambodia
—Indu Bhushan, Sheryl Keller, and Brad Schwartz, March 2002

No. 7 Causes of the 1997 Asian Financial Crisis: What Can an Early Warning System Model Tell Us?
—Juzhong Zhuang and Malcolm Dowling, June 2002

No. 8 The Role of Preferential Trading Arrangements in Asia
—Christopher Edmonds and Jean-Pierre Verbiest, July 2002

No. 9 The Doha Round: A Development Perspective
—Jean-Pierre Verbiest, Jeffrey Liang, and Lea Sumulong, July 2002

No. 10 Is Economic Openness Good for Regional Development and Poverty Reduction? The Philippines
—E. M. Pernia and Filipinas Quising, October 2002

No. 11 Implications of a US Dollar Depreciation for Asian Developing Countries
—Emma Fan, July 2002

No. 12 Dangers of Deflation
—D. Brooks and Filipinas Quising, December 2002

No. 13 Infrastructure and Poverty Reduction: What is the Connection?
—Izfal Ali and Ernesto Pernia, January 2003

No. 14 Infrastructure and Poverty Reduction: Making Markets Work for the Poor
—Xianbin Yao, May 2003

No. 15 SARS: Economic Impacts and Implications
—Emma Xiaoqin Fan, May 2003

No. 16 Emerging Tax Issues: Implications of Globalization and Technology
—Kanokpan Lao Araya, May 2003

No. 17 Pro-Poor Growth: What is It and Why is It Important?
—Ernesto M. Pernia, May 2003

No. 18 Public-Private Partnership for Competitiveness
—Jesus Felipe, June 2003

No. 19 Reviving Asian Economic Growth Requires Further Reforms
—Izfal Ali, June 2003

No. 20 The Millennium Development Goals and Poverty: Are We Counting the World’s Poor Right?
—M. G. Quibria, July 2003

No. 21 Trade and Poverty: What are the Connections?
—Douglas H. Brooks, July 2003

No. 22 Adapting Education to the Global Economy
—Olivier Dupriez, September 2003

No. 23 Avian Flu: An Economic Assessment for Selected Developing Countries in Asia

No. 24 Is Volatility Built into Today’s World Economy?
—J. Malcolm Dowling and J.P. Verbiest, February 2002

No. 25 Purchasing Power Parities and the International Comparison Program in a Globalized World
—Bishnu Pant, March 2004

No. 26 A Note on Dual/Multiple Exchange Rates
—Emma Xiaoqin Fan, May 2004

No. 27 Inclusive Growth for Sustainable Poverty Reduction in Developing Asia: The Enabling Role of Infrastructure Development
—Izfal Ali and Xianbin Yao, May 2004

No. 28 Higher Oil Prices: Asian Perspectives and Implications for 2004-2005
—Cyn-Young Park, June 2004

No. 29 Accelerating Agriculture and Rural Development for Inclusive Growth: Policy Implications for Developing Asia
—Richard Bolt, July 2004

No. 30 Living with Higher Interest Rates: Is Asia Ready?
—Cyn-Young Park, August 2004

No. 31 Reserve Accumulation, Sterilization, and Policy Dilemma
—Akiko Terada-Hagiwara, October 2004

No. 32 The Primacy of Reforms in the Emergence of People's Republic of China and India
—Izfal Ali and Emma Xiaoqin Fan, November 2004

No. 33 Population Health and Foreign Direct Investment: Does Poor Health Signal Poor Government Effectiveness?
—Ajay Tandon, January 2005

No. 34 Financing Infrastructure Development: Asian Developing Countries Need to Tap Bond Markets More Rigorously
—Yun-Hwan Kim, February 2005

No. 35 Attaining Millennium Development Goals in Health: Isn’t Economic Growth Enough?
—Ajay Tandon, March 2005

No. 36 Instilling Credit Culture in State-owned Banks—Experience from Lao PDR
—Robert Bumphrey, Paul Dickie, and Samiu ela Tukuafu, April 2005

No. 37 Coping with Global Imbalances and Asian Currencies
—Cyn-Young Park, May 2005

No. 38 Asia’s Long-term Growth and Integration: Reaching beyond Trade Policy Barriers
—Douglas H. Brooks, David Roland-Holst, and Fan Zhai, September 2005

No. 39 Competition Policy and Development
—Douglas H. Brooks, October 2005

No. 40 Highlighting Poverty as Vulnerability: The 2005 Earthquake in Pakistan
—Rana Hasan and Ajay Tandon, October 2005

No. 41 Conceptualizing and Measuring Poverty as Vulnerability: Does It Make a Difference?
—Ajay Tandon and Rana Hasan, October 2005

No. 42 Potential Economic Impact of an Avian Flu Pandemic on Asia
—Erik Bloom, Vincent de Wit, and Mary Jane Carangal-San Jose, November 2005

No. 43 Creating Better and More Jobs in Indonesia: A Blueprint for Policy Action
—Guntur Sugiyarto, December 2005

No. 44 The Challenge of Job Creation in Asia
—Jesus Felipe and Rana Hasan, April 2006

No. 45 International Payments Imbalances
—Jesus Felipe, Frank Harrigan, and Ashish Mehta, April 2006
SPECIAL STUDIES, COMPLIMENTARY
(Available through ADB Office of External Relations)

1. Improving Domestic Resource Mobilization Through Financial Development: Overview September 1985
5. Financing Public Sector Development Expenditure in Selected Countries: Overview January 1988
7. Financing Public Sector Development Expenditure in Selected Countries: Bangladesh June 1988
8. Financing Public Sector Development Expenditure in Selected Countries: India June 1988
11. Financing Public Sector Development Expenditure in Selected Countries: Pakistan June 1988
12. Financing Public Sector Development Expenditure in Selected Countries: Philippines June 1988
13. Financing Public Sector Development Expenditure in Selected Countries: Thailand June 1988
17. Foreign Trade Barriers and Export Growth September 1988
18. The Role of Small and Medium-Scale Industries in the Industrial Development of the Philippines April 1989
19. The Role of Small and Medium-Scale Manufacturing Industries in Industrial Development: The Experience of Selected Asian Countries January 1990
23. Export Finance: Some Asian Examples September 1990
27. Investing in Asia 1997 (Co-published with OECD)
28. The Future of Asia in the World Economy 1998 (Co-published with OECD)
29. Financial Liberalisation in Asia: Analysis and Prospects 1999 (Co-published with OECD)
30. Sustainable Recovery in Asia: Mobilizing Resources for Development 2000 (Co-published with OECD)
31. Technology and Poverty Reduction in Asia and the Pacific 2001 (Co-published with OECD)
32. Asia and Europe 2002 (Co-published with OECD)
33. Economic Analysis: Retrospective 2003
34. Economic Analysis: Retrospective: 2003 Update 2004
36. Investment Climate and Productivity Studies Philippines: Moving Toward a Better Investment Climate 2005
The Road to Recovery: Improving the Investment Climate in Indonesia 2005
Sri Lanka: Improving the Rural and Urban Investment Climate 2005

OLD MONOGRAPH SERIES
(Available through ADB Office of External Relations; Free of charge)

EDRC REPORT SERIES (ER)

No. 1 ASEAN and the Asian Development Bank —Seiji Naya, April 1982
No. 2 Development Issues for the Developing East and Southeast Asian Countries and International Cooperation —Seiji Naya and Graham Abbott, April 1982
No. 3 Aid, Savings, and Growth in the Asian Region —J. Malcolm Doucing and Ulrich Hiemenz, April 1982
No. 4 Development-oriented Foreign Investment and the Role of ADB —Kiyoshi Kojima, April 1982
No. 5 The Multilateral Development Banks and the International Economy’s Missing Public Sector —John Lewis, June 1982
No. 6 Notes on External Debt of DMCs —Evelyn Go, July 1982
No. 7 Grant Element in Bank Loans —Dal Hyun Kim, July 1982
No. 8 Shadow Exchange Rates and Standard Conversion Factors in Project Evaluation —Peter Warr, September 1982
No. 9 Small and Medium-Scale Manufacturing Establishments in ASEAN Countries: Perspectives and Policy Issues —Mathias Bruch and Ulrich Hiemenz, January 1983
No. 10 A Note on the Third Ministerial Meeting of GATT —Jungsoo Lee, January 1983
No. 11 Macroeconomic Forecasts for the Republic of China, Hong Kong, and Republic of Korea —J.M. Douling, January 1983
No. 12 ASEAN: Economic Situation and Prospects —Seiji Naya, March 1983
No. 13 The Future Prospects for the Developing Countries of Asia —Seiji Naya, March 1983
No. 14 Energy and Structural Change in the Asia-Pacific Region, Summary of the Thirteenth Pacific Trade and Development Conference —Seiji Naya, March 1983
No. 15 A Survey of Empirical Studies on Demand for Electricity with Special Emphasis on Price

47
Elasticity of Demand—Wisarn Pupphavesa, June 1983


No. 19 Relative External Debt Situation of Asian Developing Countries: An Application of Ranking Method—Jungsoo Lee, June 1983

No. 20 New Evidence on Yields, Fertilizer Application, and Prices in Asian Rice Production—William Jones and Teresa Ramirez, July 1983

No. 21 Inflationary Effects of Exchange Rate Changes in Nine Asian LDCs—Pradunna B. Rana and J. Malcolm Douling, Jr., December 1983

No. 22 Effects of External Shocks on the Balance of Payments, Policy Responses, and Debt Problems of Asian Developing Countries—Seiji Naya, December 1983

No. 23 Changing Trade Patterns and Policy Issues: The Prospects for East and Southeast Asian Developing Countries—Seiji Naya and Ulrich Hiemenz, February 1984

No. 24 Small-Scale Industries in Asian Economic Development: Problems and Prospects—Seiji Naya, February 1984

No. 25 A Study on the External Debt Indicators Applying Logit Analysis—Jungsoo Lee and Clarita Barretto, February 1984

No. 26 Alternatives to Institutional Credit Programs in the Agricultural Sector of Low-Income Countries—Jennifer Sour, March 1984

No. 27 Economic Scene in Asia and Its Special Features—Kedar N. Kohli, November 1984

No. 28 The Effect of Terms of Trade Changes on the Balance of Payments and Real National Income of Asian Developing Countries—Jungsoo Lee and Latgarda Labios, January 1985


No. 30 Sources of Balance of Payments Problem in the 1970s: The Asian Experience—Pradunna Rana, February 1985

No. 31 India’s Manufactured Exports: An Analysis of Supply Sectors—Ifzal Ali, February 1985

No. 32 Meeting Basic Human Needs in Asian Developing Countries—Jungsoo Lee and Emma Banaria, March 1985

No. 33 The Impact of Foreign Capital Inflow on Investment and Economic Growth in Developing Asia—Evelyn Go, May 1985

No. 34 The Climate for Energy Development in the Pacific and Asian Region: Priorities and Perspectives—V.V. Desai, April 1986

No. 35 Impact of Appreciation of the Yen on Developing Member Countries of the Bank—Jungsoo Lee, Pradunna Rana, and Ifzal Ali, May 1986

No. 36 Smuggling and Domestic Economic Policies in Developing Countries—A.H.M.N. Choudhury, October 1986

No. 37 Public Investment Criteria: Economic Internal Rate of Return and Equalizing Discount Rate—Ifzal Ali, November 1986

No. 38 Review of the Theory of Neoclassical Political Economy: An Application to Trade Policies—M.G. Quibria, December 1986

No. 39 Factors Influencing the Choice of Location: Local and Foreign Firms in the Philippines—E.M. Pernia and A.N. Herrin, February 1987

No. 40 A Demographic Perspective on Developing Asia and Its Relevance to the Bank—E.M. Pernia, May 1987


No. 42 Shifting Revealed Comparative Advantage: Experiences of Asian and Pacific Developing Countries—P.B. Rana, November 1988

No. 43 Agricultural Price Policy in Asia: Issues and Areas of Reforms—I. Ali, November 1988

No. 44 Service Trade and Asian Developing Economies—M.G. Quibria, October 1989

No. 45 A Review of the Economic Analysis of Power Projects in Asia and Identification of Areas of Improvement—I. Ali, November 1989


No. 48 Economic Growth Performance of Indonesia, the Philippines, and Thailand: The Human Resource Dimension—E.M. Pernia, January 1990


No. 50 Public Investment Criteria: Financial and Economic Internal Rates of Return—I. Ali, April 1990


No. 53 Issues in Assessing the Impact of Project and Sector Adjustment Lending—I. Ali, December 1990

No. 54 Some Aspects of Urbanization and the Environment in Southeast Asia—Ernesto M. Pernia, January 1991


No. 56 A Framework for Justifying Bank-Assisted Education Projects in Asia: A Review of the Socioeconomic Analysis and Identification of Areas of Improvement—Etienne Van De Walle, February 1992

No. 57 Medium-term Growth-Stabilization Relationship in Asian Developing Countries and Some Policy Considerations—Yun-Huan Kim, February 1993


No. 59 The Need for Fiscal Consolidation in Nepal—Ernesto M. Pernia, February 1993
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Author(s)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>International Reserves: Factors Determining Needs and Adequacy</td>
<td>Evelyn Go</td>
<td>May 1981</td>
</tr>
<tr>
<td>2</td>
<td>Domestic Savings in Selected Developing Asian Countries</td>
<td>Basil Moore, assisted by A.H.M. Nuruddin Chaudhury</td>
<td>September 1981</td>
</tr>
<tr>
<td>4</td>
<td>By-Passed Areas, Regional Inequalities, and Development Policies in Selected Southeast Asian Countries</td>
<td>William James</td>
<td>October 1981</td>
</tr>
<tr>
<td>5</td>
<td>Asian Agriculture and Economic Development</td>
<td>William James</td>
<td>March 1982</td>
</tr>
<tr>
<td>6</td>
<td>Inflation in Developing Member Countries: An Analysis of Recent Trends</td>
<td>A.H.M. Nuruddin Chaudhury and J. Malcolm Dowling</td>
<td>March 1982</td>
</tr>
<tr>
<td>7</td>
<td>Industrial Growth and Employment in Developing Asian Countries: Issues and Perspectives for the Coming Decade</td>
<td>Ulrich Hiemenz</td>
<td>March 1982</td>
</tr>
<tr>
<td>9</td>
<td>Developing Asia: The Importance of Domestic Policies</td>
<td>Seiji Noya</td>
<td>May 1982</td>
</tr>
<tr>
<td>11</td>
<td>Industrial Development: Role of Specialized Financial Institutions</td>
<td>Kedar N. Kohli</td>
<td>August 1982</td>
</tr>
<tr>
<td>13</td>
<td>Credit Rationing, Rural Savings, and Financial Policy in Developing Countries</td>
<td>William James</td>
<td>September 1982</td>
</tr>
<tr>
<td>14</td>
<td>Small and Medium-Scale Manufacturing Establishments in ASEAN Countries: Perspectives and Policy Issues</td>
<td>Mathias Bruch and Ulrich Hiemenz</td>
<td>March 1983</td>
</tr>
<tr>
<td>15</td>
<td>Income Distribution and Economic</td>
<td>Mike Shows</td>
<td>May 1985</td>
</tr>
</tbody>
</table>

**ECONOMIC STAFF PAPERS (ES)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Author(s)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Long-Run Debt-Servicing Capacity of Asian Developing Countries: An Application of Critical Interest Rate Approach</td>
<td>Jungsoo Lee</td>
<td>June 1983</td>
</tr>
<tr>
<td>18</td>
<td>The Impact of the Current Exchange Rate System on Trade and Inflation of Selected Developing Member Countries</td>
<td>Pradumna Rana</td>
<td>September 1983</td>
</tr>
<tr>
<td>19</td>
<td>Asian Agriculture in Transition: Key Policy Issues</td>
<td>William James</td>
<td>September 1983</td>
</tr>
<tr>
<td>20</td>
<td>The Transition to an Industrial Economy in Monsoon Asia</td>
<td>Harry T. Oshima</td>
<td>October 1983</td>
</tr>
<tr>
<td>21</td>
<td>The Significance of Off-Farm Employment and Incomes in Post-War East Asian Growth</td>
<td>Harry T. Oshima</td>
<td>January 1984</td>
</tr>
<tr>
<td>23</td>
<td>ASEAN Economies and ASEAN Economic Cooperation</td>
<td>Narongchai Akrasanee</td>
<td>November 1984</td>
</tr>
<tr>
<td>24</td>
<td>Economic Analysis of Power Projects</td>
<td>Nitin Desai</td>
<td>January 1985</td>
</tr>
<tr>
<td>25</td>
<td>Exports and Economic Growth in the Asian Region</td>
<td>Pradumna Rana</td>
<td>February 1985</td>
</tr>
<tr>
<td>26</td>
<td>Patterns of External Financing of DMCs</td>
<td>E. Go</td>
<td>May 1985</td>
</tr>
<tr>
<td>27</td>
<td>Industrial Technology Development the Republic of Korea</td>
<td>S. Y. Lo</td>
<td>July 1985</td>
</tr>
<tr>
<td>29</td>
<td>Rice in Indonesia: Price Policy and Comparative Advantage</td>
<td>J. K. Johnson</td>
<td>August 1985</td>
</tr>
<tr>
<td>30</td>
<td>Effects of Foreign Capital Inflows on Developing Countries of Asia</td>
<td>Jungsoo Lee, Pradunna B. Rana and Yoshihiro Iwasaki</td>
<td>April 1986</td>
</tr>
<tr>
<td>31</td>
<td>Economic Analysis of the Environmental Impacts of Development Projects</td>
<td>John A. Dixon et al., EAPI, East-West Center</td>
<td>August 1986</td>
</tr>
<tr>
<td>32</td>
<td>Science and Technology for Development: Role of the Bank</td>
<td>Kedar N. Kohli and Ifzal Ali</td>
<td>November 1986</td>
</tr>
</tbody>
</table>
No. 33 Satellite Remote Sensing in the Asian and Pacific Region
—Mohan Sundara Rajan, December 1986

No. 34 Changes in the Export Patterns of Asian and Pacific Developing Countries: An Empirical Overview
—Pradumna B. Rana, January 1987

No. 35 Agricultural Price Policy in Nepal
—Gerald C. Nelson, March 1987

No. 36 Implications of Falling Primary Commodity Prices for Agricultural Strategy in the Philippines
—Ifzal Ali, September 1987

No. 37 Determining Irrigation Charges: A Framework
—Prabakhar B. Ghate, October 1987

No. 38 The Role of Fertilizer Subsidies in Agricultural Production: A Review of Select Issues
—M.G. Quibria, October 1987

No. 39 Domestic Adjustment to External Shocks in Developing Asia
—Jungsoo Lee, October 1987

No. 40 Improving Domestic Resource Mobilization through Financial Development: Indonesia
—Philip Erquiaga, November 1987

No. 41 Recent Trends and Issues on Foreign Direct Investment in Asian and Pacific Developing Countries
—P.B. Rana, March 1988

No. 42 Manufactured Exports from the Philippines: A Sector Profile and an Agenda for Reform
—I. Ali, September 1988

No. 43 A Framework for Evaluating the Economic Benefits of Power Projects
—I. Ali, August 1989

No. 44 Promotion of Manufactured Exports in Pakistan
—Jungsoo Lee and Yoshihiro Iwasaki, September 1989

No. 45 Education and Labor Markets in Indonesia: A Sector Survey
—Ernesto M. Pernia and David N. Wilson, September 1989

No. 46 Industrial Technology Capabilities and Policies in Selected ADCs
—Hiroshi Kakazu, June 1990

No. 47 Designing Strategies and Policies for Managing Structural Change in Asia
—Ifzal Ali, June 1990

No. 48 The Completion of the Single European Community Market in 1992: A Tentative Assessment of its Impact on Asian Developing Countries
—J.P. Verbiest and Min Tang, June 1991

No. 49 Economic Analysis of Investment in Power Systems
—Ifzal Ali, June 1991

No. 50 External Finance and the Role of Multilateral Financial Institutions in South Asia: Changing Patterns, Prospects, and Challenges
—Jungsoo Lee, November 1991

No. 51 The Gender and Poverty Nexus: Issues and Policies
—M.G. Quibria, November 1993

No. 52 The Role of the State in Economic Development: Theory, the East Asian Experience, and the Malaysian Case
—Jason Brown, December 1993

No. 53 The Economic Benefits of Potable Water Supply Projects to Households in Developing Countries
—Dale Whittington and Venkateswarlu Swarna, January 1994

No. 54 Growth Triangles: Conceptual Issues and Operational Problems
—Min Tang and Myo Thant, February 1994

No. 55 The Emerging Global Trading Environment and Developing Asia
—Arcind Panagariya, M.G. Quibria, and Narhari Rao, July 1996

No. 56 Aspects of Urban Water and Sanitation in the Context of Rapid Urbanization in Developing Asia
—Ernesto M. Pernia and Stella LF. Alabastro, September 1997

No. 57 Challenges for Asia’s Trade and Environment

No. 58 Economic Analysis of Health Sector Projects—A Review of Issues, Methods, and Approaches
—Ramesh Adhikari, Paul Gertler, and Anneli Lagman, March 1999

No. 59 The Asian Crisis: An Alternate View
—Raju Kumar and Bibek Debroy, July 1999

No. 60 Social Consequences of the Financial Crisis in Asia
—James C. Knowles, Ernesto M. Pernia, and Mary Ruelas, November 1999

OCCASIONAL PAPERS (OP)

No. 1 Poverty in the People’s Republic of China: Recent Developments and Scope for Bank Assistance
—K.H. Moinuddin, November 1992

No. 2 The Eastern Islands of Indonesia: An Overview of Development Needs and Potential
—Brien K. Parkinson, January 1993

No. 3 Rural Institutional Finance in Bangladesh and Nepal: Review and Agenda for Reforms
—A.H.M.N. Chowdhury and Marcella C. Garcia, November 1993

No. 4 Fiscal Deficits and Current Account Imbalances of the South Pacific Countries: A Case Study of Vanuatu
—T.K. Jayaraman, December 1993

No. 5 Reforms in the Transitional Economies of Asia
—Pradumna B. Rana, December 1993

No. 6 Environmental Challenges in the People’s Republic of China and Scope for Bank Assistance
—Elisabetta Capannelli and Omkar L. Shrestha, December 1993

No. 7 Sustainable Development Environment and Poverty Nexus
—Ifzal Ali, December 1993

No. 8 Intermediate Services and Economic Development: The Malaysian Example
—Sutanu Behuria and Rahul Khullar, May 1994

No. 9 Interest Rate Deregulation: A Brief Survey of the Policy Issues and the Asian Experience
—Carlos J. Glower, July 1994

No. 10 Some Aspects of Land Administration in Indonesia: Implications for Bank Operations
—Sutanu Behuria, July 1994

No. 11 Demographic and Socioeconomic Determinants of Contraceptive Use among Urban Women in the Melanesian Countries in the South Pacific: A Case Study of Port Vila Town in Vanuatu
—T.K. Jayaraman, February 1995

No. 12 Managing Development through Institution Building
—Hilton L. Root, October 1995

No. 13 Growth, Structural Change, and Optimal Poverty Interventions
—Shibalida Chatterjee, November 1995

No. 14 Private Investment and Macroeconomic Environment in the South Pacific Island
SERIALS
(Available commercially through ADB Office of External Relations)

1. Asian Development Outlook (ADO; annual)
   $36.00 (paperback)
2. Key Indicators of Developing Asian and Pacific Countries (KI; annual)
   $35.00 (paperback)
3. Asian Development Review (ADR; semiannual)
   $5.00 per issue; $10.00 per year (2 issues)

SERIALS
(Available commercially through ADB Office of External Relations)

1. Asian Development Outlook (ADO; annual)
   $36.00 (paperback)
2. Key Indicators of Developing Asian and Pacific Countries (KI; annual)
   $35.00 (paperback)
3. Asian Development Review (ADR; semiannual)
   $5.00 per issue; $10.00 per year (2 issues)

STATISTICAL REPORT SERIES (SR)

No. 1 Estimates of the Total External Debt of the Developing Member Countries of ADB: 1981-1983
   —I.P. David, September 1984
No. 2 Multivariate Statistical and Graphical Classification Techniques Applied to the Problem of Grouping Countries
   —I.P. David and D.S. Maligalig, March 1985
No. 3 Gross National Product (GNP) Measurement Issues in South Pacific Developing Member Countries of ADB
   —S.G. Tiwari, September 1985
No. 4 Estimates of Comparable Savings in Selected DMCs
   —Hananto Sigit, December 1985
No. 5 Keeping Sample Survey Design and Analysis Simple
   —I.P. David, December 1985
No. 6 External Debt Situation in Asian Developing Countries
   —I.P. David and Jungsoo Lee, March 1986
No. 7 Study of GNP Measurement Issues in the South Pacific Developing Member Countries
   Part I: Existing National Accounts of SPDMCs—Analysis of Methodology and Application of SNA Concepts
   —P. Hodgkinson, October 1986
No. 8 Study of GNP Measurement Issues in the South Pacific Developing Member Countries
   Part II: Factors Affecting Intercountry Comparability of Per Capita GNP
   —P. Hodgkinson, October 1986
No. 9 Survey of the External Debt Situation in Asian Developing Countries, 1985
   —Jungsoo Lee and I.P. David, April 1987
No. 10 A Survey of the External Debt Situation in Asian Developing Countries, 1986
   —Jungsoo Lee and I.P. David, April 1988
No. 11 Changing Pattern of Financial Flows to Asian and Pacific Developing Countries
   —Jungsoo Lee and I.P. David, March 1989
No. 12 The State of Agricultural Statistics in Southeast Asia
   —I.P. David, March 1989
   —Jungsoo Lee and I.P. David, July 1989
No. 14 A Survey of the External Debt Situation in Asian and Pacific Developing Countries: 1988-1989
   —Jungsoo Lee, May 1990
No. 15 A Survey of the External Debt Situation in Asian and Pacific Developing Countries: 1989-1992
   —Min Tang, June 1991
No. 16 Recent Trends and Prospects of External Debt Situation and Financial Flows to Asian and Pacific Developing Countries
   —Min Tang and Aludia Pardo, June 1992
No. 17 Purchasing Power Parity in Asian Developing Countries: A Co-Integration Test
   —Min Tang and Ronald Q. Butiong, December 1992
No. 18 Surges and Volatility of Private Capital Flows to Asian Developing Countries: Implications for Multilateral Development Banks
   —Pradumna B. Rana, December 1998
No. 19 The Millennium Round and the Asian Economies: An Introduction
   —Dilip K. Das, October 1999
No. 20 Occupational Segregation and the Gender Earnings Gap
   —Joseph E. Zveglich, Jr. and Yana van der Meulen Rodgers, December 1999
No. 21 Information Technology: Next Locomotive of Growth?
   —Dilip K. Das, June 2000

No. 19 Surges and Volatility of Private Capital Flows to Asian Developing Countries: Implications for Multilateral Development Banks
   —Pradumna B. Rana, December 1998
No. 20 The Millennium Round and the Asian Economies: An Introduction
   —Dilip K. Das, October 1999
No. 21 Occupational Segregation and the Gender Earnings Gap
   —Joseph E. Zveglich, Jr. and Yana van der Meulen Rodgers, December 1999
No. 22 Information Technology: Next Locomotive of Growth?
   —Dilip K. Das, June 2000
FROM OXFORD UNIVERSITY PRESS:
Oxford University Press (China) Ltd
18th Floor, Warwick House East
Tai Kok Place, 979 King's Road
Quarry Bay, Hong Kong
Tel (852) 2516 3222
Fax (852) 2565 8491
E-mail: webmaster@oupchina.com.hk
Web: www.oupchina.com.hk

1. Informal Finance: Some Findings from Asia
   Prabhu Ghate et. al., 1992
   $15.00 (paperback)

2. Mongolia: A Centrally Planned Economy
   in Transition
   Asian Development Bank, 1992
   $15.00 (paperback)

3. Rural Poverty in Asia, Priority Issues and Policy
   Options
   Edited by M.G. Quibria, 1994
   $25.00 (paperback)

4. Growth Triangles in Asia: A New Approach to
   Regional Economic Cooperation
   Edited by Myo Thant, Min Tang, and Hiroshi Kakazu
   1st ed., 1994   $36.00 (hardbound)
   Revised ed., 1998 $55.00 (hardbound)

5. Urban Poverty in Asia: A Survey of Critical Issues
   Edited by Ernesto Pernia, 1994
   $18.00 (paperback)

6. Critical Issues in Asian Development:
   Theories, Experiences, and Policies
   Edited by M.G. Quibria, 1995
   $15.00 (paperback)
   $36.00 (hardbound)

7. Financial Sector Development in Asia
   Edited by Shahid N. Zahid, 1995
   $50.00 (hardbound)

8. Financial Sector Development in Asia: Country Studies
   Edited by Shahid N. Zahid, 1995
   $55.00 (hardbound)

   in the People's Republic of China
   Christine P.W. Wong, Christopher Heady, and Wing T. Woo, 1995
   $15.00 (paperback)

10. From Centrally Planned to Market Economies:
    The Asian Approach
    Edited by Pradumna B. Rana and Naved Hamid, 1995
    Vol. 1: Overview
    $36.00 (hardbound)
    Vol. 2: People's Republic of China and Mongolia
    $50.00 (hardbound)
    Vol. 3: Lao PDR, Myanmar, and Viet Nam
    $50.00 (hardbound)

11. Current Issues in Economic Development:
    An Asian Perspective
    Edited by M.G. Quibria and J. Malcolm Dowling, 1996
    $50.00 (hardbound)

12. The Bangladesh Economy in Transition
    Edited by M.G. Quibria, 1997
    $20.00 (hardbound)

13. The Global Trading System and Developing Asia
    Edited by Arvind Panagariya, M.G. Quibria,
    and Narhari Rao, 1997
    $55.00 (hardbound)

14. Social Sector Issues in Transitional Economies of Asia
    Edited by Douglas H. Brooks and Myo Thant, 1998
    $25.00 (paperback)
    $55.00 (hardbound)

FROM EDWARD ELGAR:
Marston Book Services Limited
PO Box 269, Abingdon
Oxon OX14 4YN, United Kingdom
Tel +44 1235 465500
Fax: +44 1235 465555
Email: direct.order@marston.co.uk
Web: www.marston.co.uk

1. Reducing Poverty in Asia: Emerging Issues in Growth,
   Targeting, and Measurement
   Edited by Christopher M. Edmonds, 2003

FROM PALGRAVE MACMILLAN:
Palgrave Macmillan Ltd
Houndmills, Basingstoke
Hampshire RG21 6XS, United Kingdom
Tel: +44 (0)1256 329242
Fax: +44 (0)1256 479476
Email: orders@palgrave.com
Web: www.palgrave.com/home/

1. Labor Markets in Asia: Issues and Perspectives
   Edited by Jesus Felipe and Rana Hwaen, 2006

2. Competition Policy and Development in Asia
   Edited by Douglas H. Brooks and Simon Evenett, 2005

3. Managing FDI in a Globalizing Economy
   Asian Experiences
   Edited by Douglas H. Brooks and Hal Hill, 2004

4. Poverty, Growth, and Institutions in Developing Asia
   Edited by Ernesto M. Pernia and Anil B. Deolalikar, 2003

SPECIAL STUDIES, CO-PUBLISHED
SPECIAL STUDIES, IN-HOUSE
(Available commercially through ADB Office of External Relations)

1. Rural Poverty in Developing Asia
   Edited by M.G. Quibria
   Vol. 1: Bangladesh, India, and Sri Lanka, 1994
     $35.00 (paperback)
   Vol. 2: Indonesia, Republic of Korea, Philippines, and Thailand, 1996
     $35.00 (paperback)

2. Gender Indicators of Developing Asian and Pacific Countries
   Asian Development Bank, 1993
     $25.00 (paperback)

3. External Shocks and Policy Adjustments: Lessons from the Gulf Crisis
   Edited by Naved Hamid and Shahid N. Zahid, 1995
     $15.00 (paperback)

4. Indonesia-Malaysia-Thailand Growth Triangle: Theory to Practice
   Edited by Myo Thant and Min Tong, 1996
     $15.00 (paperback)

5. Emerging Asia: Changes and Challenges
   Asian Development Bank, 1997
     $30.00 (paperback)

6. Asian Exports
   Edited by Dilip Das, 1999
     $35.00 (paperback)
     $55.00 (hardback)

7. Development of Environment Statistics in Developing Asian and Pacific Countries
   Asian Development Bank, 1997
     $30.00 (paperback)

8. Mortgage-Backed Securities Markets in Asia
   Edited by S.Ghon Rhee & Yutaka Shimomoto, 1999
     $35.00 (paperback)

9. Rising to the Challenge in Asia: A Study of Financial Markets
   Asian Development Bank
   Vol. 1: An Overview, 2000 $20.00 (paperback)
   Vol. 2: Special Issues, 1999 $15.00 (paperback)
   Vol. 3: Sound Practices, 2000 $25.00 (paperback)
   Vol. 4: People’s Republic of China, 1999 $20.00 (paperback)
   Vol. 5: India, 1999 $30.00 (paperback)
   Vol. 6: Indonesia, 1999 $30.00 (paperback)
   Vol. 7: Republic of Korea, 1999 $30.00 (paperback)
   Vol. 8: Malaysia, 1999 $20.00 (paperback)
   Vol. 9: Pakistan, 1999 $30.00 (paperback)
   Vol. 10: Philippines, 1999 $30.00 (paperback)
   Vol. 11: Thailand, 1999 $30.00 (paperback)
   Vol. 12: Socialist Republic of Viet Nam, 1999 $30.00 (paperback)

10. Corporate Governance and Finance in East Asia: A Study of Indonesia, Republic of Korea, Philippines and Thailand
    Vol. 1: A Consolidated Report, 2000 $10.00 (paperback)
    Vol. 2: Country Studies, 2001 $15.00 (paperback)

11. Financial Management and Governance Issues
    Asian Development Bank, 2000
    Cambodia $10.00 (paperback)
    People’s Republic of China $10.00 (paperback)
    Mongolia $10.00 (paperback)
    Pakistan $10.00 (paperback)
    Papua New Guinea $10.00 (paperback)
    Uzbekistan $10.00 (paperback)
    Viet Nam $10.00 (paperback)
    Selected Developing Member Countries $10.00 (paperback)

12. Government Bond Market Development in Asia
    Edited by Yun-Hwan Kim, 2001
     $25.00 (paperback)

13. Intergovernmental Fiscal Transfers in Asia: Current Practice and Challenges for the Future
    Edited by Paul Smoke and Yun-Hwan Kim, 2002
     $15.00 (paperback)

14. Guidelines for the Economic Analysis of Projects
    Asian Development Bank, 1997
     $10.00 (paperback)

15. Guidelines for the Economic Analysis of Telecommunications Projects
    Asian Development Bank, 1997
     $10.00 (paperback)

    Asian Development Bank, 1999
     $10.00 (paperback)

    Asian Development Bank, 2000
     $10.00 (paperback)

    Asian Development Bank, 2001
     $10.00 (paperback)

    Asian Development Bank, 2002
     $10.00 (paperback)

    Asian Development Bank, 2002
     $10.00 (hardback)

21. Defining an Agenda for Poverty Reduction, Volume 1
    Edited by Christopher Edmonds and Sara Medina, 2002
     $15.00 (paperback)

22. Defining an Agenda for Poverty Reduction, Volume 2
    Edited by Isabel Ortiz, 2002
     $15.00 (paperback)

23. Economic Analysis of Policy-based Operations: Key Dimensions
    Asian Development Bank, 2003
     $10.00 (paperback)