

Education and structural change in four Asian countries

Introduction

Education is widely acknowledged to facilitate improvements in health outcomes, family planning, gender equality, and political empowerment. And since employers usually reward education well, access to decent education is also critical for ensuring equality of opportunity.

Rather than revisiting these issues (World Bank 2006 surveys them well), this chapter of *Asian Development Outlook 2007 (ADO 2007)* examines the role of education as a contributor to change in the structure of the macroeconomy. Education can facilitate economic transformation in at least two ways. First, education can be an important input into production, raising worker productivity in any given activity. Thus, higher levels of education should make it easier for an economy to engage in new activities. Second, it can act as a catalyst to change—empowering entrepreneurs to develop or adopt new technologies, or to introduce new economic activities.

This chapter looks at the first of these two roles of education in facilitating change. It uses large microeconomic datasets (see *Bibliography and References*) designed to capture the aggregate employment structure from four countries—India, Indonesia, Philippines, and Thailand. It documents what workers of different education levels do for a living, what they are paid for doing it, and how these have changed over the past decade or so. One object of the enquiry is to establish whether the numbers of workers recently trained in each country's schools and colleges are adequate to meet the demands of a changing economy. Another objective is to see whether rising education levels in these countries can be linked to the changing structure of employment, trade liberalization, and technological changes. A third is to see whether the more educated countries transformed their employment structures faster.

The results show that the four countries are creating educated workers faster than they are creating jobs in the sectors that historically hired them. This may be a positive development if countries have managed with too little educated labor in the past. But, as an empirical fact, it is leading to rising education levels across the board, including in some sectors and jobs that do not pay a premium for education, that cannot be required to compete with foreign workers, or that have not seen big changes in technology. As a consequence of this (and of historical conditions), in every job examined, education levels rank the same way across the four countries: Filipino workers are always the most educated, followed by Indonesians, Thais, and then Indians. These results suggest that in many

situations, education is being acquired for reasons independent of the “requirements” of the jobs currently available.

Generalizing a little across the four countries, the economywide wage returns to basic education (the percentage increase in wages associated with completing an extra year of schooling) have fallen in every country at almost every level of the primary and secondary school system. This is, of course, consistent with the increase in enrollment and graduation rates over time. In contrast, and despite a growing supply of college-educated workers, the returns to tertiary education are rising. This implies a polarizing wage distribution. Worryingly, with the returns to basic education falling, the power of existing basic education systems to combat wage inequality has been reduced.

The results suggest that these shifts in returns are rooted in the emerging pattern of employment—a point reinforced by the analysis in the chapter *Growth amid change*, in Part 3 of *ADO 2007*. While the output of the much vaunted “knowledge economy” steams ahead (particularly in India), the employment shares of these nontraditional services are growing slowly, if at all, and from a low base. Thus the bulk of newly educated workers continue to find employment in traditional services, agriculture, construction, and where possible, manufacturing. Such workers are increasingly unemployed as well, and with greater frequency at higher education levels.

Unfortunately, the returns to basic education in agriculture (which outside the Philippines employs the majority of workers) and industry are generally only modest. In fact the returns to education in industry have fallen in all four countries, in some cases to very low levels. *Growth amid change* argues that industrialization is a prerequisite for growth that cannot be bypassed. The results from the current chapter suggest that industrial expansion is not being held back by a limited supply of basic education. On a more positive note, the returns to education in the aggregate services sector remain high.

Generalization, however, is fraught with difficulty, as some trends vary by country. The supply of secondary-educated workers is increasing very slowly in India, but racing ahead in the other three countries. Industry’s employment share has grown recently in India and Thailand, but fallen in Indonesia and the Philippines. Manufacturing labor productivity has been stagnant since the 1970s in the Philippines (see Part 3), but only stalled in the aftermath of the Asian crisis in Indonesia. In India and Thailand, industrial labor productivity has been rising. With so many important differences, it is not obvious that returns are falling for the same reason in each country. Rigorously explaining trends and drawing general lessons is therefore very difficult. Furthermore, India and Thailand, where more jobs are being created that pay a high premium for education, will secure greater benefits from additional educated workers than will the Philippines.

Regardless of what may (or may not) be driving them, the trends themselves have implications. Falling returns to education indicate that if a lack of educated workers constrained productivity initially, then this constraint has loosened. And it has loosened most obviously in agriculture, industry, and lower-status services. Also, the results show quite clearly that as the supply of basic education expanded, jobs did

not grow organically to absorb the educated. Moreover, employment structures have clearly transformed fastest in the less-educated countries - India and Thailand. Of course the reasons for this could be legion, and cannot be ascertained with a sample of only four countries. But whatever the reasons, there is little evidence from these four examples that higher basic education levels bring structural change in their wake.

The leap from these results to policy is a long one. For one thing, education is obviously intended to do much more than raise wages and facilitate new economic activities. The results of this chapter also show that the wage premiums are sensitive to a wide variety of conditions that can change rapidly for reasons independent of the school system, so long-term state and individual education investment decisions should not be based entirely on current economic conditions. Nevertheless, a realistic sense of what the current employment structure is, and how it has been changing, are important for grounding education policy planning empirically.

Conclusive empirical research in education economics is always difficult, principally because crucial variables are always unmeasured, and some may be unmeasurable. The data used in this chapter do not capture school quality or skills. Datasets measuring skills and school quality exist, but were not designed to capture employment structure, and so cannot be used in a study of structural change. Therefore, while better education probably has a major role to play in facilitating change, the issue cannot be analyzed using the data available.

Given that increasing the quantity of educated workers is not a priority for facilitating transformation, but that improving the quality of education might be, it is vital that governments and development agencies working in the field focus on systematically measuring education quality to work out whether interventions have the desired results. Similarly, labor force surveys need to collect data on school attributes so that the labor market outcomes of differently educated workers can be more fully analyzed.

Education and economic growth

Models of education and growth can be divided roughly into two (Aghion and Howitt 1998). The first type of model considers education to be an input into production, much like equipment or labor (e.g., Mankiw, Romer, and Weil 1992). In this view, economies with greater numbers of educated workers should produce more output. Subject to certain technical assumptions, economies that accumulated more education should have grown faster and obtained higher income levels, other things being equal. Treating education as an input, and by introducing various market failures that could lead to underinvestment in education, numerous growth theorists have attempted to explain divergences in the growth paths of economies in terms of the growth of their education stock. Such market failures derive from spillovers of productivity between workers (Lucas 1988) and the difficulties with financing education given that it cannot be used as collateral for borrowing (Ljungqvist 1993; Galor and Zeira 1993; Azariadis and Drazen 1990).

None of these education-as-input models pay much attention to *why* education influences productivity, *what* workers might produce, *who*

should be educated, or *what types* of education to invest in. The central issues are the amount of human capital and output, not their composition or application. They are therefore fairly blunt in their policy implications. Most of them imply that subsidizing education can stimulate growth.

The second type of model considers education to be integral to an economy's capacity for technological innovation and adaptation. Thus, an economy that is far from some global technological frontier but that has a reasonable supply of educated scientists and managers will be able to catch up more quickly in technological terms, generating higher growth en route.

Nelson and Phelps (1966) are explicit that what matters for growth is not a high level of universal education, but having crucial personnel with the necessary education. According to these writers, to be crucial to transformation, a worker must be engaged in a nonroutine task, face new technological choices, and be in an organizational position to innovate. Presumably this implies the ability to redirect capital to new activities. In this view, productivity increases because education enables well-placed personnel to introduce new technologies, activities, and outputs.

Romer (1990) takes a more inclusive view of the role of education in transformation. In his model, the more education that is applied to research and development (R&D), the faster new activities are generated, and the higher the rate of growth. As educated labor could be attracted to pursuits other than R&D, countries with higher levels of universal education can engage in more R&D and grow faster. Romer's work on R&D is widely thought to describe conditions in advanced economies relatively well, while Nelson and Phelps' model of technology adoption and adaptation is a more apt description of developing economies' experiences.

Turning from models to data, there is substantial microeconomic evidence in favor of the view that the value of education in development depends on the scope for technology adoption. Studies of technology adoption are littered with evidence that more-educated workers have adopted new profitable technologies more readily. One particularly arresting and relevant example concerns the Green Revolution period in India. Foster and Rosenzweig (1996) observed that: more-educated households turned to high-yielding crop varieties (HYVs) more rapidly; those states that adopted HYVs experienced faster agricultural growth; returns to primary education expanded significantly during this time; and these returns increased faster in areas that grew faster. These results, and others like them (see also evidence presented in Rosenzweig 1995), point to a two-way causal relationship between education and growth, conditional on the availability of new and better technology.

As argued above, most of the education-as-input models predict that, other things being equal, output growth rates should correlate positively with the human capital *growth rate*. In contrast, Nelson and Phelps, and Romer predict that higher initial *levels* of education capital would drive subsequent output growth. So what do the data suggest? Notwithstanding some serious econometric problems with cross-country growth regressions, it is worth reviewing the evidence—limited and hotly debated as it is.

First, surprisingly, growth rates of education attainment are often

found to be *negatively* correlated with growth in GDP per worker. This regularity was reported by Pritchett (1996), Benhabib and Spiegel (1994), and Islam (1995). Given that models linking education to productivity growth are motivated by microeconomic evidence that employers are willing to pay more for educated workers, and that this willingness has been shown to reflect the greater cognitive skills of the educated (Glewwe 2002) this result appears paradoxical. For if education renders individual workers more productive, then surely across-the-board increases in education should render the aggregate labor force more productive as well? As these expected aggregate productivity improvements did not materialize, then “Where has all the education gone?” asks Pritchett. This extraordinarily important and startling paradox has sparked intense debate on how to measure education-growth relationships.

Nelson and Phelps, and Romer’s views appear to survive empirical scrutiny. Several studies have found positive relationships between initial education levels and subsequent output growth. Benhabib and Spiegel (1994) show that even after correcting for income levels and education levels, those countries that were further from the world technological frontier, grew faster. Moreover, this rate of arguably technology-driven convergence is more rapid in countries with higher education levels. Bils and Klenow (2000) calibrate a growth model to see if it can explain the education–growth linkage. Critically, they find that most of the causality from education to growth must be explained by education’s influence on technology.

Nevertheless, econometric problems preclude a neat conclusion of this debate. For example, Krueger and Lindahl (2001) have argued that the lack of a measurable relationship between education expansion and growth may simply reflect a failure to measure human capital stocks accurately. Hanushek and Woessmann (2007) review studies with more refined data, and conclude that both the level and growth rate of education attainment matter for growth. Moreover, they develop a dataset drawn by pooling the results of several international standardized tests of skills, and using it, find that growth is robustly related to the quality of education.

One important caveat on these results, entered quite convincingly by Bils and Klenow, is that the association between education and growth could be explained by reverse causality, as richer countries—or those anticipating more investment, higher returns to education, and faster growth—invest in more schooling. To date though, no microeconomic evidence on this question of reverse causality has been drawn from the developing world.

A rather different view of the role of education in growth comes from Lewis (2004), who argues that “public debate on education is confused” (p. 243), essentially because the role of education in development is misunderstood. He defines education as “the means through which societies acquire political philosophies based on individual rights.” Any impact of such education on growth is likely to be long term. On the other hand, trainability, Lewis feels, or the capacity to learn to use new production technologies, is what matters for rapid labor productivity growth. In short, therefore, he argues, education is not a constraint on the ability of current workforces to be trained in operations with much higher productivity levels.

A brief overview of education outcomes and policy in four countries

Of the four countries studied in this chapter, India is the least educated. Thais are slightly less educated than Indonesians, and Filipinos are the most highly educated (Figure 3.2.1). Three of the four countries have aggressively pursued increases in education levels, especially at the secondary level, during the period under consideration. Around 9% of Thai secondary education is privately provided. The corresponding figure is 20% for the Philippines, down from 32% in the mid-1990s, and roughly 40% for India and Indonesia (Table 3.2.1).

3.2.1 Private school enrollment as percentage of total

	Secondary				Tertiary		
	India	Indonesia	Philippines	Thailand	Indonesia	Philippines	Thailand
1994	-	42.4	32.0	6.9	-	-	-
1995	-	-	30.8	6.2	-	-	-
1996	-	-	29.5	6.0	-	-	-
1997	-	-	-	-	-	-	-
1998	-	-	28.0	-	-	-	-
1999	-	-	26.3	-	-	73.1	-
2000	42.4	-	-	-	-	-	19.5
2001	42.6	42.7	22.7	6.7	62.8	68.7	18.9
2002	42.0	42.7	21.5	-	62.7	67.2	18.8
2003	41.9	42.9	20.5	8.2	61.1	66.4	-
2004	-	42.9	19.7	8.8	65.2	65.7	18.5
2005	-	-	-	12.9	-	-	16.9

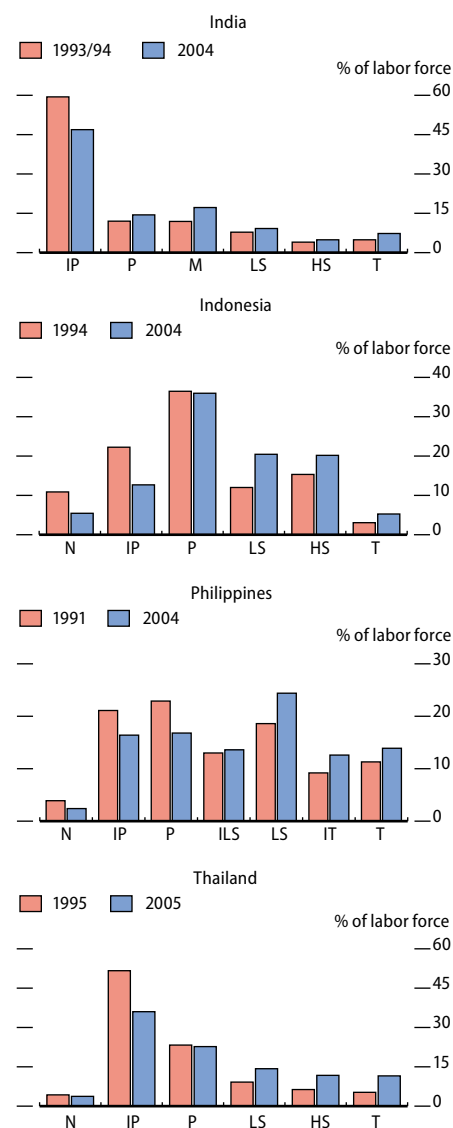
- = data not available.

Source: World Bank, available: <http://genderstats.worldbank.org/edstats/query/default.htm>, downloaded 17 January 2007.

Indonesia's Government undertook a sharp increase in primary school building in the mid-1970s, backed by oil revenues. This included the abolition of fees for grades 1–3 in 1976 and grades 4–6 in 1978. This led to a substantial increase in enrollment rates (Duflo 2001). Notwithstanding these gains in primary attendance, lower and upper secondary enrollment rates actually contracted during the fifth Five-Year Plan (1989–1994), reflecting perceptions of low returns to secondary education and high out-of-pocket costs (Booth 1999). Lower secondary education was therefore declared compulsory in the mid-1990s, though 10 years on, schools are still being created to accommodate the increased attendance (Sugiyarto, Oey-Gardiner, and Triaswati 2006). Around 40% of secondary education in Indonesia therefore remains privately provided. For tertiary education, the figure rises to 65% (Table 3.2.1).

Similarly, the constitution of the Philippines (1987) committed the state to providing quality affordable education at all levels to all people, and Republic Act 6655 (1988) followed this up with a concrete policy of free secondary education. These changes do not appear to have led to an acceleration in graduation rates, which were already high. However, private secondary school attendance has fallen (Table 3.2.1). The 1974 Bilingual (English-Tagalog Program) Education Policy and its renewal in 1987 permitted the use of the “local vernaculars....as auxiliary to the media of instruction, but only when necessary to facilitate understanding

3.2.1 Education profile of the labor force



N = none; IP = incomplete primary; P = primary; ILS = incomplete lower secondary; LS = lower secondary; HS = higher secondary; IT = incomplete tertiary; T = tertiary.

Note: Labor force refers to employed and unemployed persons 15 years old and above.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 1994, 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

of concepts being taught in English and Filipino” (Quisumbing 1989, p.311). The policy has resulted in a sharp decline in English proficiency across cohorts.

Education policy in the Philippines since the late 1970s has been driven by an explicit government policy to promote international migration as a solution to the local job creation problem, and a source of income (recorded transfers from migrants are as high as 10% of GDP) (Felipe and Lanzona 2006). Private vocational colleges, many of which operate as little more than “diploma mills,” often connected to overseas employment agencies, have mushroomed. In combination with a trend toward opening state colleges (there were 19 in 1987, but 111 in 2006), this private-education expansion has led to a sharp rise in tertiary education, 66% of which is privately provided, and a polarization in quality. Moreover, the cost of the expansion into secondary and tertiary education, exacerbated by population pressure, has added to huge strains on education budgets and has drawn resources away from basic education (Maglen and Manasan 1998). Nevertheless, in the context of high unemployment, successive generations of Filipinos have continued to acquire increasing levels of education.

Thailand has historically had a difficult time expanding access to education, especially in rural areas. In the early 1990s, as low-skill industry boomed and as companies attempted to move up the value chain, limited availability of (especially) secondary graduates was viewed as a serious problem, and returns to education in the industry sector were high (Booth 1999; and Table 3.2.7 below). The Government responded. The 1997 constitution created a right to 12 years of free, quality basic education. The Education Act (1999) then extended mandatory schooling levels from 6 to 9 years. Together with rising income levels, which may have driven demand for secondary education, as well as tightening urban-rural linkages, such legislation led to significant expansions in secondary graduation rates in the 1990s and early 2000s. Education in Thailand remains mostly a public undertaking (Table 3.2.1).

Education policy in India has followed a different route. While by law education is free and compulsory up to the age of 14, in reality, only 53% of the labor force had completed primary school in 2004. The chief cause appears to be the abysmal quality of the primary education system (PROBE 1999, Pratham 2005). Primary enrollment rates have been extraordinarily low, particularly in rural areas, and among socially marginalized communities in both rural and urban settings. A sharp quality divide has emerged between public and private education, and a boom in urban working class incomes during the last decade has led to even tighter bottlenecks in admission to private education. Attempts to circumvent the quality problems in mainstream basic education through the promotion of vocational training also seem to have failed (Anant et al. 2006).

Meanwhile, India has cultivated a specialty in high-quality tertiary education. Graduates from elite, publicly supported science and technology institutes command impressive salaries, and aspirations to enter these institutions are high. Good private schools and colleges are also—increasingly—oversubscribed, as evidenced by the soaring “donations” for admissions through the 1990s. Given overwhelming evidence that

the small number of high-quality tertiary institutions is becoming a bottleneck, the Government is under increasing pressure to liberalize tertiary education—particularly rules governing foreign participation. Instead, it has responded with an ambitious plan to double the number of places at central government universities in order to accommodate further expansions in affirmative action for disadvantaged groups (Hasan and Mehta 2006). Notwithstanding the importance of tertiary institutions for Indian output, enrollment rates are currently around 14%, and only around 7% of the Indian labor force is college educated.

Changes in employment structure and education intensity

Figure 3.2.2 shows the education profiles of workers in agriculture, industry, and services. They very clearly show that agriculture hires the least-educated workers, and services the most-educated. Industry employs the modestly schooled.

With these trends in mind, it is useful to examine how the rise in education levels relates to changes in the structure of employment. Table 3.2.2 depicts the first, most aggregate pass at this for each of the four countries. The labor force is split into those working in the three major sectors of the economy and the unemployed. (Later on in this section a more disaggregated approach is taken, but with little change in the results.) Each country's employment profile was observed at two points in time between 10 and 13 years apart.

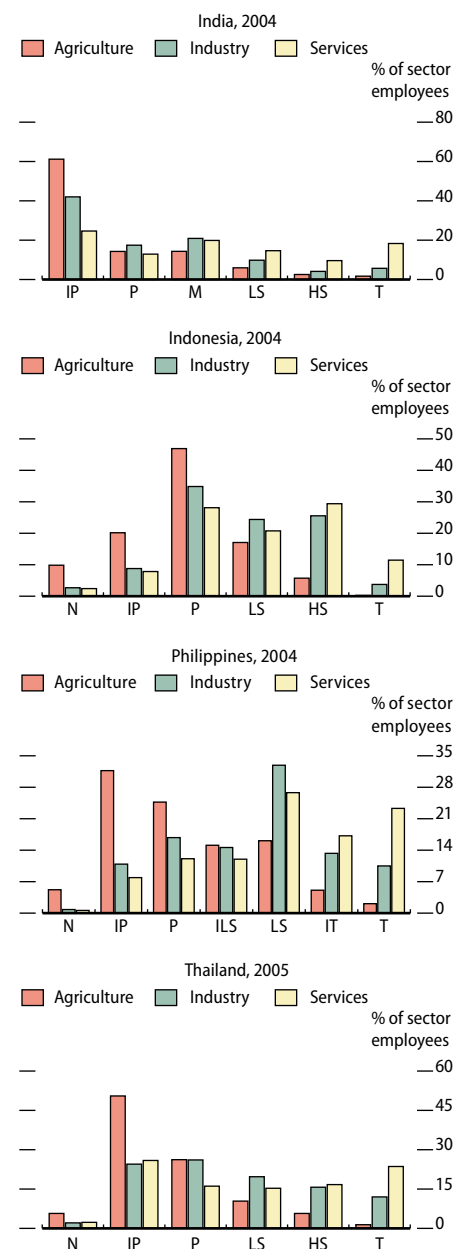
The first three columns depict the proportions of each country's labor force in each activity in the initial and final years, and how they have changed. (Note that unemployment rates are comparable over time but not across countries.) The table shows unemployment rising rapidly in every country. Trends in agricultural, industrial, and services employment shares, however, are country specific.

Agriculture's employment share has been declining very rapidly in those countries that reached their land frontiers before the 1990s. The Philippines ran out of new arable land in the 1970s. Thailand did so by 1980, as did most regions of India. In contrast, Indonesia, which is still clearing forests for agriculture, experienced only a small decline in agriculture's employment share. The Indonesian figures also reflect a return of low-skilled labor to agricultural activity in the wake of the Asian crisis of 1997–98. Thailand, with its more sophisticated arrangements for reallocating capital, has come back from the crisis sooner than Indonesia, and agricultural employment has continued to contract.

Industrially, India has had some recent success, while Thailand has been industrializing for some time now. Industrial employment in Indonesia and the Philippines has been shrinking. *Growth amid change* (Part 3) shows that this deindustrialization is occurring at very low levels of industrial development, which raises alarm bells, especially in the Philippines, where deindustrialization cannot be explained in terms of the crisis alone.

Services employment is rising everywhere, though most in the

3.2.2 Education distribution by sectors



N = none; IP = incomplete primary; M = middle; P = primary; ILS = incomplete lower secondary; LS = lower secondary; HS = higher secondary; IT = incomplete tertiary; T = tertiary.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Round 60, January–June 2004; Indonesia SAKERNAS 2004; Philippine Labor Force Survey, October 2004; Thailand Labor Force Survey, October 2005.

[Click here for figure data](#)

3.2.2 Education intensification and structural change, lower secondary

India	Employment share (%)			Education intensity (%)			Between sector	Within sector	Contribution by sector	Contribution by sector (%)
	1993/94	2004	Change	1993/94	2004	Change				
Aggregate	100.0	100.0	0.0	16.7	21.5	4.8	1.8	3.0	4.8	100.0
Agriculture	59.3	51.3	-8.0	6.8	10.2	3.4	-0.5	1.7	1.2	24.6
Industry	15.1	19.0	3.9	18.4	19.6	1.2	0.7	0.2	0.9	19.8
Services	21.9	24.7	2.8	38.0	42.6	4.6	1.1	1.1	2.2	46.1
Unemployed	3.8	5.1	1.3	41.2	39.3	-1.9	0.5	-0.1	0.5	9.5
Percentage of intensification due to between- and within-sector effects							37.3	62.7		
Indonesia	Employment share (%)			Education intensity (%)			Between sector	Within sector	Contribution by sector	Contribution by sector (%)
	1994	2004	Change	1994	2004	Change				
Aggregate	100.0	100.0	0.0	30.4	45.9	15.5	1.5	14.0	15.5	100.0
Agriculture	42.9	40.5	-2.4	12.1	23.1	11.0	-0.3	4.5	4.2	26.9
Industry	18.2	16.8	-1.3	34.1	53.7	19.6	-0.5	3.3	2.8	18.3
Services	34.3	36.2	1.8	45.5	61.6	16.1	0.8	5.8	6.7	42.9
Unemployed	4.6	6.5	1.9	74.4	81.4	7.0	1.4	0.5	1.8	11.9
Percentage of intensification due to between- and within-sector effects							9.6	90.4		
Philippines	Employment share (%)			Education intensity (%)			Between sector	Within sector	Contribution by sector	Contribution by sector (%)
	1991	2004	Change	1991	2004	Change				
Aggregate	100.0	100.0	0.0	39.1	50.9	11.7	3.4	8.3	11.7	100.0
Agriculture	41.3	33.1	-8.2	17.1	23.2	6.2	-1.4	2.0	0.6	5.4
Industry	14.6	13.7	-0.9	46.5	56.7	10.3	-0.4	1.4	1.0	8.3
Services	35.1	42.3	7.2	57.5	67.3	9.8	4.1	4.2	8.3	70.6
Unemployed	9.0	10.9	1.9	56.7	63.5	6.8	1.1	0.7	1.8	15.7
Percentage of intensification due to between- and within-sector effects							29.0	71.0		
Thailand	Employment share (%)			Education intensity (%)			Between sector	Within sector	Contribution by sector	Contribution by sector (%)
	1995	2005	Change	1995	2005	Change				
Aggregate	100.0	100.0	0.0	20.2	36.5	16.3	2.8	13.6	16.3	100.0
Agriculture	51.4	42.0	-9.4	6.7	17.5	10.7	-0.6	4.5	3.9	23.7
Industry	19.5	21.6	2.2	28.4	46.6	18.3	0.6	4.0	4.6	27.9
Services	28.0	35.0	7.0	38.8	51.9	13.1	2.7	4.6	7.3	44.8
Unemployed	1.1	1.4	0.2	27.6	65.4	37.9	0.1	0.5	0.6	3.5
Percentage of intensification due to between- and within-sector effects							17.0	83.0		

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 1994, 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

Philippines and Thailand. In India, where industrial employment surged, services employment rose only slightly, challenging the view from value-added data that India is becoming a services economy. Low net exit from agriculture in Indonesia has been associated with limited services growth.

The next three columns of the table depict measures of education intensity—the share of workers in each sector holding at least a lower secondary (LS) certificate—and how they have shifted. Consistent with Figure 3.2.2, services are always the most intensive users of LS graduates, followed by industry, and then agriculture. Also, the unemployed are more likely to have completed LS than the employed.

In Indonesia, Philippines, and Thailand, LS intensities are rising rapidly economywide. India is focusing on raising primary completion rates and LS prevalence has grown much less. Not having many primary graduates to push up the ladder further, limits scope for LS expansion in India. Perhaps most important, education intensity has risen in every section of the labor force.

The seventh column asks what increase in the labor force share of LS educated workers would be required algebraically to support the observed

change in employment structure, without raising LS prevalence within sectors. In India, for example, with 38% of service workers having LS education initially, 2.8% growth in the services employment share would have required a further 1.1% of the labor force to pass LS ($1.1\% = 38\% \times 2.8\% \times 100$). Adding this 1.1% to the corresponding projected changes in the other three sectors implies that to accommodate its employment shift between these four sectors without increasing LS-intensity within sectors, India would have required only a 1.8% increase in LS graduates. The remaining 3% increase in graduates' share in the labor force (or 62.7% of the 4.8 point intensity increase between 1993/94 and 2004) is accounted for by increases in intensity *within* each sector.

The penultimate column shows that, of the 4.8 point increase in LS graduates, 2.2% of the labor force (or 46.1% of the increase in graduates) were absorbed in services. Given that the sector employs only 24.7% of the labor force, services disproportionately absorbed the increase in LS educated workers. So did unemployment.

This last trend, whereby services and unemployment disproportionately absorb LS graduates, is common to all countries. Industry also absorbs its fair share of LS graduates in India and Thailand.

Country experiences differ. In rapidly educating and glacially transforming Indonesia, structural change accounts for less than a tenth of the increase in education. That figure rises to 17% in Thailand, where rapidly rising employment in industry and services helped absorb some of the educated entrants. The extraordinarily large increase in education among Thailand's unemployed is also noteworthy. In the Philippines, nearly 30% of the observed intensification can be algebraically attributed to structural change, as workers shifted out of both (education unintensive) agriculture and industry, and into services and unemployment. As the country deindustrialized, services absorbed 70% of new graduates.

These differences notwithstanding, what remains remarkable is the much larger portion of the education expansion that is *not* attributable to structural change at the four-sector level. A possible explanation is that four sectors is not enough, and this analysis masks subsectoral shifts in the composition of economic activity. Perhaps education-intensive *subsectors* have been growing. Therefore, a more disaggregated look at the data is warranted. (Unfortunately, incompatibility of sector classifications

3.2.3 Contribution of structural change to Education intensification in the services sector, lower secondary, Philippines

	Employment share (%)			Education intensity (%)		
	1991	2004	Change	1991	2004	Change
Retail trade	32.7	33.5	0.7	45.5	61.0	15.4
Transportation and storage	12.2	15.4	3.1	49.1	57.2	8.1
Personal and household services	17.8	14.2	-3.6	34.2	48.1	13.9
Public administration and defense	11.1	9.6	-1.5	84.7	84.0	-0.7
Education	8.1	6.4	-1.7	96.8	98.3	1.6
Hotels and restaurants	3.7	5.3	1.6	59.6	76.6	17.0
Business services	2.5	4.0	1.5	83.5	92.7	9.2
Health, social work, and other social and community services	3.4	3.1	-0.3	83.6	87.9	4.3
Wholesale trade	3.0	2.9	-0.1	55.9	60.5	4.7
Recreational and cultural services	1.9	2.0	0.1	55.8	65.6	9.9
Communications	0.6	0.9	0.3	94.8	96.4	1.6
Banking institutions	1.2	0.8	-0.3	95.4	97.5	2.1
Nonbank financial intermediation	0.3	0.8	0.6	90.4	95.1	4.7
Real estate	0.6	0.7	0.1	79.6	90.8	11.1
Insurance	0.6	0.3	-0.3	96.2	93.5	-2.7
Sanitary and similar services	0.1	0.2	0.0	70.0	22.4	-47.6
Extraterritorial organizations and bodies	0.2	0.0	-0.2	82.9	100.0	17.1
Services sector as a whole	100.0	100.0		57.3	67.3	10.0
Increase in lower secondary intensity necessary to accommodate shifting labor force shares between sectors						-0.2
As percentage of observed increase in intensification						-1.9
Increase in lower secondary intensity due to rising intensity within sectors						10.2
As percentage of observed increase in intensification						101.9

Source: Philippine Labor Force Survey, 1991, 2004, October rounds.

between survey years precludes a much more detailed analysis of the Indonesian experience.)

Noting that an 86% of the increase in educated Filipino workers was absorbed into services and unemployment, Table 3.2.3 disaggregates services to shed light on why 10% more service workers now have LS degrees. The results are stark. If education intensities in the 17 services subsectors remained unchanged, while employment shares moved as they have, the share of service workers with LS education would have *fallen* by 0.2 percentage points. This happens for two reasons. First, the changes in employment shares (third column) are not large, indicating very little structural change within services. Second, while employment shares in a few LS-intensive subsectors (e.g., “business services,” “hotels and restaurants”) have increased, unintensive sectors (e.g., “transportation”) have grown as well. Thus *the entire* increase in education intensity in services is algebraically attributable to intensification *within* these 17 subsectors.

Together with Table 3.2.2, these results show that, other than a push out of agriculture into services and unemployment, there have been precious few changes in the structure of the Philippine economy that could absorb the surge in educated workers.

In Thailand and India, all sectors absorbed significant numbers of the educated, so it is more useful to disaggregate their entire employment structure, not just the services sector. Table 3.2.4 shows that in Thailand, even after disaggregating the labor force into 23 subsectors, transformation only explains 21% of the proliferation of LS graduates. Although some education intensive subsectors of the economy (e.g., “manufacturing and repair,” “hotels and restaurants”) grew, they were initially not sufficiently large or education intensive to absorb the increase in educated workers. Similarly in India, a 25 subsector decomposition (Table 3.2.5) only raises the fraction of intensification explained by structural change from 37% to 39%. Thus, education levels rose in almost every subsector in both countries.

Indian and Thai employment data share other important features. Manufacturing’s employment share is growing. Construction is booming, at least in India, while the apparent construction slowdown in Thailand is relative to the pre-Asian crisis building

3.2.4 Decomposing Education intensification into 23 subsectors, lower secondary, Thailand

	Employment share (%)			Education intensity (%)		
	1995	2005	Change	1995	2005	Change
Agriculture, hunting, and forestry	50.3	40.8	-9.5	6.6	17.4	10.8
Fishing	1.1	1.2	0.1	12.7	20.3	7.6
Mining and quarrying	0.1	0.1	0.0	26.6	39.8	13.3
Manufacturing and repair	13.3	16.2	2.9	31.0	51.7	20.7
Electricity, gas, and water supply	0.5	0.3	-0.2	77.2	74.9	-2.3
Construction	5.6	5.0	-0.6	18.2	29.0	10.9
Retail trade	9.9	10.3	0.3	31.4	47.8	16.4
Transportation	2.8	2.6	-0.2	27.5	44.7	17.2
Personal and household services	1.8	1.8	0.0	15.2	32.8	17.5
Public administration and defense	3.0	3.1	0.1	69.2	81.3	12.1
Education, science, and research	2.7	3.2	0.5	37.5	38.6	1.1
Hotels and restaurants	3.2	6.3	3.1	32.1	39.9	7.8
Health and medical services	0.9	1.4	0.5	79.5	86.1	6.6
Social work, and other social and community services	0.1	0.3	0.3	37.4	71.4	34.0
Wholesale trade	1.6	2.5	0.9	31.8	48.7	16.9
Recreational, cultural, and sporting activities	0.3	0.6	0.3	36.8	64.7	27.9
Warehousing	0.0	0.1	0.1	46.0	65.7	19.7
Communication	0.2	0.2	0.1	89.7	89.1	-0.6
Financial intermediation	0.6	0.7	0.1	85.5	93.5	8.0
Real estate	0.1	0.3	0.1	73.9	58.9	-14.9
Business activities including renting	0.6	1.4	0.8	61.3	68.5	7.3
Insurance	0.2	0.3	0.1	78.4	85.4	7.1
Sanitary and similar activities	0.1	0.2	0.1	14.5	30.4	15.9
Unemployed	1.1	1.4	0.3	27.6	65.4	37.9
Aggregate	100.0	100.0	0.0	20.1	36.5	16.3
Increase in lower secondary intensity necessary to accommodate shifting labor force shares between sectors						3.4
As percentage of observed increase in intensification						21.1
Increase in lower secondary intensity due to rising intensity within sectors						12.9
As percentage of observed increase in intensification						78.9

Source: Thailand Labor Force Survey, 1995, 2005, October rounds.

boom. Wholesale trade is on the rise. Growth of India's transport sector in this context probably reflects demand-side factors, rather than just growing labor supply (as it does in the Philippines). Even in Thailand, where transport's employment share fell slightly, crudely disaggregating the employment data shows a falling share of taxi drivers, and a rising share of truck drivers.

Furthermore, there is credible evidence of falling education intensity within some large subsectors in India. One positive sign is the 2.5 point reduction in the proportion of workers in household and personal services with LS degrees. This subsector, which includes most of the traditional trades—hair-dressing, house cleaning, child care, etc.—is probably a residual category housing many of the disguised unemployed. De-intensification in this sector might indicate that secondary graduates are finding more remunerative employment.

Perhaps the most surprising result in India is the de-intensification of business services and IT-enabled services. The sector contains a large and diverse set of services besides IT, and has doubled its employment in absolute terms. Indeed, one common feature of transformation is that firms outsource a number of activities, leading to growth in separate low-skill business services such as photocopying, renting of equipment, filing, etc. If growth of low-skill complementary services indeed explains the de-intensification of business services, this puts the promise of job growth led by the high-tech business services sector into perspective. This sector must have employed far less than 0.9% of India's labor force in 2004.

Also in contrast to the hype about India's high-end service economy, labor force *shares* in most "knowledge economy" subsectors (including education, science, and research; financial intermediation; business services; insurance) are much larger in Thailand than in India. On recent trends, this is unlikely to change.

Finally, the above tables help to examine the role of increased international competition between workers in driving demand for education. This role is often championed by the media. From the disaggregated analyses of each country, it can be seen that the majority of additional educated workers are absorbed in the nontraded services sector

3.2.5 Decomposing Education intensification into 25 subsectors, lower secondary, India

	Employment share (%)			Education intensity (%)		
	1993/94	2004	Change	1993/94	2004	Change
Agriculture, hunting, and forestry	58.8	50.9	-8.0	6.9	10.2	3.3
Fishing	0.5	0.4	0.0	3.7	8.1	4.4
Mining and quarrying	0.8	0.9	0.1	14.5	15.2	0.7
Manufacturing	10.4	11.7	1.3	20.3	23.1	2.8
Utilities	0.4	0.3	-0.1	47.5	51.0	3.5
Construction	3.5	6.1	2.6	10.5	12.1	1.6
Retail	5.9	5.2	-0.6	26.0	31.7	5.7
Transportation	2.7	3.8	1.0	22.6	24.4	1.8
Household and personal services	2.7	2.1	-0.6	11.3	8.7	-2.5
Public administration and defense	3.2	2.1	-1.1	60.8	65.5	4.7
Education, science, and research	1.8	2.4	0.6	83.8	86.3	2.5
Hotels and restaurants	0.9	1.3	0.5	13.8	20.2	6.4
Health and medical	0.5	0.7	0.2	69.6	77.7	8.1
Social work and other community services	0.3	0.4	0.1	30.7	39.7	9.0
Wholesale trade	1.2	2.8	1.7	38.3	42.7	4.5
Recreational and cultural services	0.2	0.2	0.0	37.8	39.9	2.1
Warehousing	0.0	0.0	0.0	28.3	49.0	20.8
Communications	0.2	0.4	0.2	71.9	76.5	4.6
Financial intermediation	0.5	0.5	0.0	87.1	82.8	-4.4
Real estate	0.0	0.1	0.0	56.1	64.3	8.2
Business services	0.3	0.9	0.6	75.3	70.1	-5.2
Insurance	0.1	0.1	0.1	86.9	91.9	5.0
Sanitary and similar services	0.1	0.1	0.0	11.6	12.4	0.8
Extraterritorial organizations and bodies	0.0	0.0	0.0	62.9	35.6	-27.3
Repair	1.0	1.3	0.3	23.7	29.3	5.6
Unemployment	3.8	5.1	1.3	41.2	39.3	-1.9
Aggregate	100.0	100.0	0.0	16.7	21.5	4.8
Increase in lower secondary intensity necessary to accommodate shifting labor force shares between sectors						1.9
As percentage of observed increase in intensification						39.4
Increase in lower secondary intensity due to rising intensity within sectors						2.9
As percentage of observed increase in intensification						60.6

Source: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004.

and in unemployment—i.e., they are not in competition with foreign workers. Further, even in India and Thailand, where industry is absorbing educated workers, this is not sufficient to posit a link between trade and education. Specifically, in India, industrial workers have become less educated than the labor force at large during the very time when trade has been liberalized and industrial exports have been growing. And, as the next section shows, returns to education in Indian and Thai industry have also been falling during this time.

Returns to education

The above results are insufficient for drawing economic conclusions regarding the need for educated workers. True, education levels are rising in almost every subsector of the economy. But this could simply reflect a shortage of educated workers in the first place. To understand whether educated workers are over- or undersupplied, the discussion now turns to an analysis of the relative prices (wages) of workers of different education levels.

To do so, Box 3.2.1 introduces two important terms—the Mincerian and full rate of return—and explains how each of them could be interpreted to assess whether the labor force is “overeducated” relative to the job opportunities available.

Table 3.2.7 presents Mincerian returns to years of different levels of schooling for workers in two experience brackets—those who left school 10–15 years before the sample was drawn (“midcareer workers”), and those who did so 20–25 years before (“senior workers”). These returns are calculated from median wages paid to employees in each education category. Returns to education for all employees are presented first, followed by the returns among agricultural, industrial, and services sector workers. Returns for each experience bracket are provided from the initial survey year (10–13 years before) and the final survey year (2004 or 2005). There are several gaps in the table corresponding to returns that could not be estimated because there were too few sector workers with the necessary education and experience levels in the sample.

Several trends are apparent in the Mincerian returns. They are lower at lower levels of the school system, probably because private costs of basic education are lower as well. Moreover, returns to basic education (primary, middle, and sometimes LS school) have fallen in most sectors. Nowhere is this clearer than in the industry sector, where the returns to basic education are now moderately low. The immediate implication of falling returns is that if the supply of educated workers has been a constraint on industrial growth, this bottleneck is easing. One interpretation of this result is that the expansion of supply of suitably educated workers for industrial jobs has reduced scarcity. A possible complementary explanation is that, consistent with the writings of Harry Braverman (1974), industrialization and the splitting of the industrial supply chain across ever-more workers have led to tasks being fragmented to an extent where mental acuity and flexibility no longer matter as much.

In contrast with basic education, tertiary returns have risen. This is consistent with many studies documenting a polarizing income distribution in Asia.

3.2.1 Mincerian returns vs. full returns to education

The Mincerian return (Mincer 1958) to a particular education qualification is the percentage difference in wages earned by two workers who differ only in that one has the qualification and the other does not. The full (private) rate of return captures this wage premium, aggregated over the workers' careers, but also factors in the direct costs (fees, uniforms, books, etc.) of obtaining the qualification. Given that wages rise slowly over a worker's career, and that schooling is relatively expensive, the full rate of return is usually lower than the Mincerian return (for illustration, see Psacharopoulos and Ng 1994; for emphasis, see McEwan 1999).

Thus, if Mincerian returns are zero, full rates of return are usually negative. Or, if the Mincerian return is smaller than the return to other forgone investments in the economy, the full rate of return is likely to be below the opportunity cost of investment as well. In such a circumstance, the workforce may be said to be "overeducated" (Harberger 1965). Whereas a growing body of work on overeducation provides several other, generally weaker definitions of the phenomenon (McGuinness 2006), given the variety of other roles served by education in development, this chapter uses the definition least likely to take issue with investments in schooling economically.

This brief overview of the relationship between Mincerian and full returns was necessary, because while the results in the previous section imply that it will be useful to ask whether investments in education are paying off, good estimates of the direct cost of schooling are lacking. In the following section, any situation wherein the Mincerian return is less than the real cost of funds

is taken to be indicative of "overeducation." The return on a 10-year bond, corrected for expected inflation (box table) is taken as an estimate of the economywide real cost of funds. The economic cost of funds for education investment would certainly be higher than these rates, as sovereign loans carry lower rates of interest than private ones, especially private loans to finance education. Using these rates therefore deliberately biases the study against finding evidence of overeducation.

A cautionary word: overeducation may be short term, while investments in schooling are not, so the distance from such results to education policy should not be traversed in a single bound. Further, several benefits of education are not captured in wages, implying that private returns underestimate the social returns. Conversely, if talent is not observable, academic credentials may be used to dispense better jobs or promotions, in which case the private returns overstate the true social returns of education.

While the evidence from a very limited set of developing countries suggests that this type of "credentialism" is not empirically important for determining wages (Glewwe 2002), the issue could well be important in extreme environments where unemployment is high and education levels are rising fast. Thus, the following analysis of wage returns should only be taken as

a crude indicator of where overeducation is occurring.

Rather than drawing education policy conclusions from this, it is hoped that the results will draw attention to other distortions that may be preventing the full benefits of schooling from being realized.

Estimated cost of funds, %

	Period bond rate observed	Annual inflation in year of observation	10-year bond rate	Minimum real cost of funds
India	June 2004	6.4	5.9	-0.5
Indonesia	August 2004	6.1	6.1	0.0
Philippines	October 2004	6.0	13.5	7.0
Thailand	October 2005	4.5	6.1	1.5

Sources: Asian Development Outlook database; CEIC Data Company Ltd.; Money Market Association of the Philippines, available: <http://www.mart.com.ph>; Bloomberg; all downloaded 26 February 2007.

Returns in services are higher than in industry and agriculture. This suggests that the concentration of more-educated workers in services is not entirely residual. In contrast, comparing the returns between agriculture and industry does not yield obvious trends.

Finally, returns to higher secondary and tertiary education, and in the Philippines, LS education, have mostly held up much better for senior workers than their midcareer counterparts. These effects are most pronounced in industry and services (except in Thailand). Combined with falling returns to basic education and rising returns to tertiary, this yields a picture highly evocative of Nelson and Phelps' view of the links between education and structural change. Highly skilled workers in senior positions who can introduce new ideas and technologies are rewarded well for their education, while more junior workers are not.

3.2.7 Returns to education by sector, cohort, and country

	All sectors				Agriculture				Industry				Services			
	Initial		Subsequent		Initial		Subsequent		Initial		Subsequent		Initial		Subsequent	
	MC	S	MC	S	MC	S	MC	S	MC	S	MC	S	MC	S	MC	S
India	1993/94		2004		1993/94		2004		1993/94		2004		1993/94		2004	
Middle	9.1	10.1	6.3	12.3	0.0	2.3	3.4	0.0	11.1	11.9	7.3	3.6	5.2	13.1	8.7	14.5
Secondary	14.5	26.4	10.1	23.3	0.0	10.1	3.6	0.0	11.2	20.3	2.8	14.5	16.7	12.8	10.3	18.6
Higher secondary	22.5	7.3	14.6	16.0			0.0		12.8	3.3	8.0	6.9	16.3	5.9	18.4	13.1
Postsecondary	15.9	15.4	29.6	20.1					18.6	17.4	28.9	23.3	13.9	15.2	20.5	20.5
Indonesia	1994		2004		1994		2004		1994		2004		1994		2004	
Primary school	3.1	12.2		5.8		6.0		6.6		5.3				17.4		
Junior high school	11.6	14.0	11.2	18.6	12.0	26.6	10.1	21.6	7.4	11.9	7.7	6.8	11.6	9.1	14.1	21.1
Senior high school	11.9	14.9	10.9	19.7	10.1		14.5	10.1	10.8	18.6	10.1	12.6	11.7	13.5	13.0	14.5
Tertiary	9.3	10.3	12.5	5.7					24.8	25.7	17.0	18.9	8.4	9.0	12.5	5.7
Philippines	1991		2004		1991		2004		1991		2004		1991		2004	
Elementary graduate	3.7		7.0	12.2												
High school graduate	16.1	10.4	7.5	9.8	5.7	0.0	4.7	2.0	9.3	2.6	3.6	5.7	24.3	17.2	10.1	10.9
College graduate	12.6	11.6	18.9	22.2					11.0	17.0	11.1	18.9	16.0	10.4	19.6	21.3
Thailand	1995		2005		1995		2005		1995		2005		1995		2005	
Elementary	7.4	10.6	11.0	6.2		7.0		3.1		10.0	3.8	4.2	7.6	11.4	11.3	5.8
Lower secondary	7.7	26.8	5.3	13.4	5.3		-1.4	12.6	5.4	21.3	3.7	7.1	11.1	25.0	8.4	15.5
Upper secondary	13.8	8.7	9.5	17.0			8.1	9.0	15.9	36.5	5.3	14.5	9.6	8.7	8.5	16.5
Postsecondary	16.1	15.6	19.4	28.7					13.6	7.4	23.3	36.1	16.7	14.7	17.2	24.6

- = insufficient sample size for calculation of returns.

MC = midcareer workers; S = senior workers.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 1994, 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

Turning next to country specifics, consider India, where returns to basic education in agriculture, which employs a large majority of the primary educated, are very low. Indeed, given the low Mincerian returns, the full returns to education in India's agricultural sector are probably negative (the direct costs of schooling in India are reported to be high relative to the incomes of the poor)—a certain indicator of overeducation. Overeducation in the context of rampant illiteracy implies only that the problem originates outside the education system. While India's public schools are in a sorry state, especially in rural areas, these startling results cannot be ascribed to school quality. Economywide returns to basic education in India were much higher in 1993/94, but have fallen since then. Problems detailed in PROBE (1999) indicate that quality has been a problem for a lot longer. It is therefore more likely that the low returns in agriculture reflect the well-documented stagnation of agricultural productivity. Reasons for this stagnation, and what to do about it, are presented in the chapter on India in Part 2 of *ADO 2007*.

As in other countries, India's returns to basic education in industry have fallen (as well as in agriculture), further dragging down the overall returns. Economywide, only returns to college and, for older workers,

higher secondary education, have grown. However, returns at some levels of education and experience are rising in the services sector.

The Indonesian story is complicated by reverse migration. Less-educated workers in Indonesia were disproportionately pushed out of industry into lower-productivity agricultural jobs, driving up the returns to schooling. This was probably especially relevant for senior workers, among whom job stability would be positively correlated with education. This exemplifies the idea that if job security is tied to education, high returns in a turbulent environment do not necessarily reflect a real scarcity of educated workers. Conversely, education expansion may have exerted pressure in the other direction, driving returns down. The inability to track changes in Indonesian employment structure at a more disaggregate level precludes a more detailed interpretation of these results.

Returns to LS schooling fell sharply in the Philippines, albeit from a high base. In contrast, tertiary education has become more valued over time. Certainly, falling returns to LS schooling are consistent with the increased supply of educated workers, deindustrialization, and structural stagnation in services described in the previous section. Moreover, the next section shows that in some of the faster growing services occupations, returns to education are approximately zero.

It is also useful to note that in the Philippines there has been a substantial increase in education requirements for access to jobs. A survey compiled by the Bureau of Labor and Employment Statistics shows that LS or college degrees are now required for entry to every formal sector job in the country. An obvious interpretation is that as education levels rose, education criteria for the same old jobs became tighter, and the returns (probably associated with rank in the company hierarchy) simply migrated up the education ladder. This view sits well with the findings of the Philippine Presidential Commission on Educational Reform 2000 Report, which lamented that: "The country has too long suffered the imbalance of an overly credential-conscious society, which puts a premium more on diplomas than knowledge or skills, and values prestige institutions granting degrees more than the competence that the degree itself embodies."

It is important to note that according to the Commission on Higher Education, 66% of college education in the Philippines in 2003/04 was privately provided, and therefore unsubsidized. This may help to explain why wage returns to college have not been driven down by supply.

The real cost of funds in the Philippines in 2004 was roughly equal to the LS Mincerian returns in 2004, so overeducation is likely, especially in agriculture and industry. Having said this, the high cost of funds at that time was due to the Philippine Government's poor external debt position, which is now on the mend. Thus overeducation could be temporary. However, unless long-term stagnation within and outside agriculture is reversed, returns could fall well below the cost of funds.

Finally, in Thailand, where secondary education was made free of charge in the period considered, the supply of LS graduates has boomed and returns have fallen. While midcareer workers are too old to have taken advantage of these public subsidies, they are probably more readily replaceable by younger workers than the older cohorts. Thus it seems

reasonable that the entry of large numbers of new graduates would have driven down their returns on LS schooling. However, most college schooling is still not subsidized in Thailand, and returns to college are therefore still rising, particularly as the services sector takes off. There is also no apparent bottleneck in the supply of industrial workers with basic education. The somewhat low returns to basic education are compensated for by a low cost of funds, so it is not clear whether Thai workers are overeducated.

A look at some telling occupations

An earlier section (*Changes in employment structure and education intensity*) showed that the availability of secondary-educated workers has expanded far faster than structural change would require algebraically, so that education levels within almost every subsector of the economy have risen. It also finds many of the newly educated employed in sectors that are shown to have very low returns. The previous section (*Returns to education*) went on to show many bottlenecks due to the limited availability of workers with basic education easing. However, it is premature to conclude that more education is not necessary. It remains possible that rising education levels within subsectors result from technological changes.

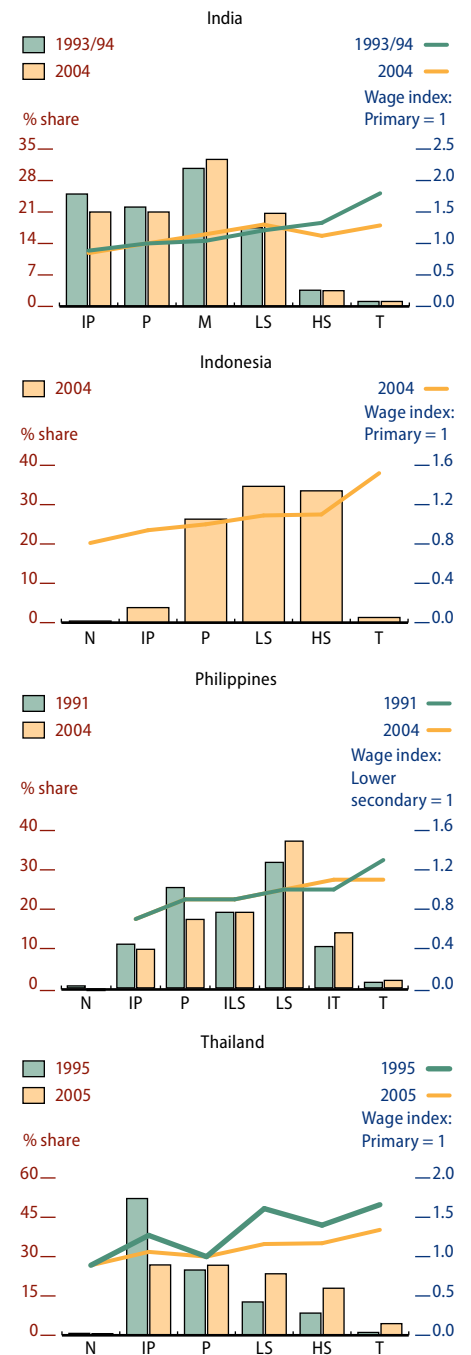
Figures 3.2.3–9 show how the distribution of education and the wage returns have altered among employees within several occupations in the four countries. Table 3.2.8 provides estimates of the relative importance of these activities over time.

While much could be said about the details of these figures, three points stand out. First, within any given occupation, education levels differ tremendously across countries. Consider drivers (Figure 3.2.3), the median among whom have around 6 years of education in Thailand, 7 years in India, 9 in Indonesia, and 10 in the Philippines. Similar discrepancies are observed in all occupations, with Indian and Thai workers always having the lowest education levels, Indonesians occupying the middle, and Filipinos always being the most educated. Given the broad similarity of technologies utilized by drivers and household helpers across countries, it is difficult to conceive of good reasons why demand for education in these activities should vary so much. It seems likely that these are residual categories into which workers of any education category may fall, rather than face unemployment. The detailed examination of wages in these jobs, below, reinforces this interpretation.

Second, the wage returns align with the more aggregate results from the previous section. Education wage premiums in most of these services sector occupations have fallen in the Philippines and Thailand, but appear to have held firm in India.

Third, the first four occupations in Table 3.2.8 are clearly not what one has in mind when one speaks of the “knowledge economy.” Yet to be sure, they account for a substantial, and in the Philippines and India—a growing—share of nonagricultural employment. The case that transformation requires more education across the board must hinge on some notion that these rather significant sources of employment will be phased out soon.

3.2.3 Education profile and wage indexes of male drivers



N = none; IP = incomplete primary; M = middle; P = primary; ILS = incomplete lower secondary; LS = lower secondary; HS = higher secondary; IT = incomplete tertiary; T = tertiary.

Note: Limited to commercial drivers and to those reporting wages.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 1994, 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

3.2.8 Prevalence of selected occupations

Occupation	India		Indonesia	Philippines		Thailand	
	1993/94	2004	2004	1991	2004	1995	2005
Male drivers ^a	2.6	4.1	3.0	14.4	17.5	13.2	10.9
Female household servants ^b	6.5	9.9	4.7	10.3	11.6	2.7	1.8
Male security guards ^a	1.3	1.2	1.4	-	-	1.6	1.2
Retail sales staff	2.1	2.8	-	2.6	3.4	2.4	7.4
Directors and managers, financial ^c	0.3	0.3	-	-	-	-	-
Bookkeepers and cashiers ^c	0.8	0.6	1.4	-	-	3.3	1.9
Clerical workers ^c	4.3	3.5	-	3.8	4.4	0.3	0.6
Engineers and engineering technicians ^c	0.9	0.9	-	-	-	0.4	1.0

- = no directly comparable data available.

^a % of total male nonagricultural employment. ^b % of total female nonagricultural employment. ^c % of total nonagricultural employment.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

With regard to the details of jobs, it can be seen that drivers (Figure 3.2.3 above) account for an arrestingly high percentage of nonagricultural male employment in both the Philippines and Thailand. For this large portion of the Southeast Asian male labor force, technology is not propelling rising education levels, as it simply has not changed. Jeepneys, buses, motorized tricycles, and taxis have not evolved much, if at all, over the sample period. Further, the returns to education among drivers are extremely low. Indeed, when one considers that less-educated drivers reside disproportionately in rural areas with lower costs of living, the real return to education for drivers in India, Philippines, and Thailand could be around zero. In other words, these men did not acquire their education in the aspiration of becoming drivers. Yet in these three countries, drivers are significantly more educated now than they used to be. Furthermore, if it is presumed that productivity differentials between drivers will be reflected in wage differences, then the zero premium on schooling indicates that there is nothing intrinsic to the technologies operated by drivers that requires education.

Female household helpers are considered next (Figure 3.2.4). Filipino maids earned essentially no wage premium on schooling in 1991 or in 2004, while returns to LS education and below for Indian maids have also flattened to zero. Yet education levels among maids of both nationalities have risen—especially in the Philippines. The interpretation is exactly the same as for drivers.

In Thailand too, the wage premium for education among maids has fallen to nearly zero. Yet in contrast with the Philippine case, the education level of Thai maids has fallen, suggesting that the more-educated maids are finding better-paid employment.

Some tasks that underwent technological change are examined next, including retail sales, bookkeeping, and secretarial work. In each of these, economists would predict a return to education, because more-educated workers can negotiate new technologies more easily. As expected, in each of these professions, the wage premiums on secondary school are higher than those earned by drivers, maids, and security guards.

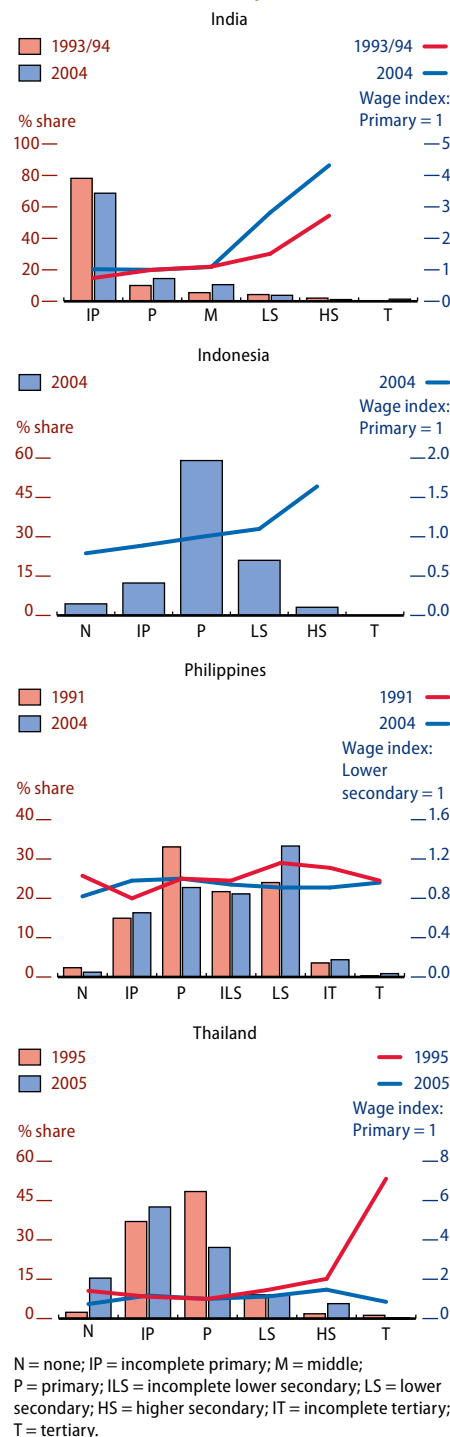
The above analysis suggests that workers of different education levels can be easily interchanged with each other, as education profiles of occupations vary greatly across countries. Countries with higher education levels in aggregate ended up with more-educated workers in

every occupation. Some of these jobs, which are large employers, have not experienced technological change, and others do not even pay a premium for more-educated workers, implying that workers did not obtain their education in order to get these jobs. Finally, education indeed reaps a higher premium in those occupations that have encountered technological change.

Some will argue, rightly, that the analysis focuses disproportionately on lower-status or mechanical jobs, to the exclusion of more “cerebral” professions. One argument for looking at these professions is that the flowering of supply chains and just-in-time inventory management may have increased the cognitive complexity of management jobs. Casual empiricism also confirms that the value of education in these professions is climbing. However, the focus of the analysis was determined by a noteworthy statistical constraint. For most of the cerebral occupations scrutinized (e.g., bank managers, software technicians, pure engineers, and retail sales managers) the samples were too thin to be statistically useful for estimating education profiles or wage premiums. There is nothing intrinsic to the sampling schemes employed by the labor force surveys that would cause these professions to be undersampled. There are simply very few people employed in such activities in the four sample countries.

A further feature of many of the cerebral professions is that education requirements are mandated by law or regulations (doctors, lawyers, nurses, engineers, bureaucrats, etc.). In this context there is very little scope for examining education intensification or changes in wage profiles within these groups, as Figure 3.2.9 shows clearly.

3.2.4 Education profile and wage indexes of female household helpers

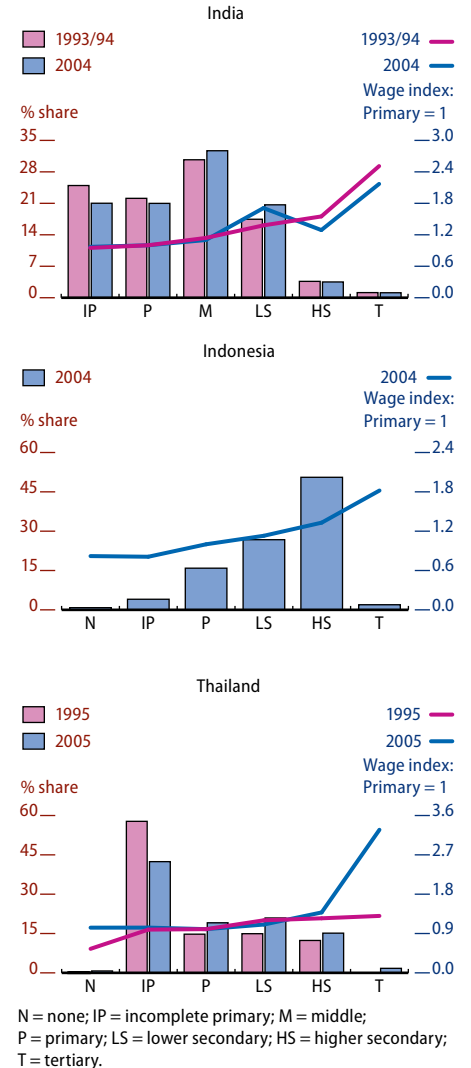


Note: Limited to those reporting wages.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 1994, 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

3.2.5 Education profile and wage indexes of male security guards



Note: Limited to those reporting wages.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 1994, 2004; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

Conclusions

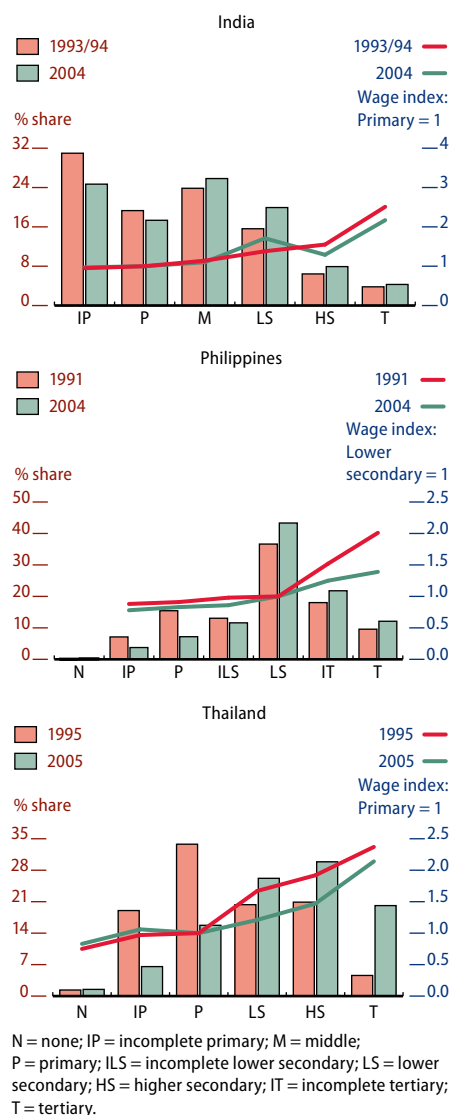
This chapter has examined the evolving distribution of education, wages, and employment in four Asian countries. It found education levels running ahead of employment growth in sectors that have traditionally hired the educated. Education levels rose in almost all sectors and occupations. This result is normatively ambiguous. Education levels may have risen within activities because they were too low from a productivity perspective to begin with. In this view, rising education levels should have increased productivity. Alternatively, education levels may have risen simply because education has become cheaper, unemployment is high, incomes are rising—or any number of other reasons unrelated to the productivity benefits of education.

It was therefore important to distinguish between two sets of explanations of education intensification: that it has been driven by productivity imperatives; or by something other than productivity imperatives. Under the assumption that worker productivity is reflected in wages, wage returns to education in specific sectors and occupations were therefore examined.

The returns to basic education have fallen, and now lie below the cost of funds in several sectors and occupations. Moreover, the sector this occurs in varies by economy. There is evidence that Filipino and Indian agricultural workers are overeducated, as are Filipino and (perhaps) Thai industrial workers. Furthermore, there are particular groups of workers, including Indian agricultural laborers, and drivers and maids everywhere, who receive a negligible return on their schooling. In the Philippines, where job creation has been anemic, the education levels and employment shares of drivers and maids are increasing. This is a sure sign that marginal educated workers reap no rewards for their schooling.

However, the point of this discussion is not that education subsidies need to be scaled back. Overeducation can be resolved relatively quickly through declines in the cost of funds, and more occasionally by dramatic technological shifts. Rather, the point is that severe distortions must

3.2.6 Education profile and wage indexes of retail sales staff

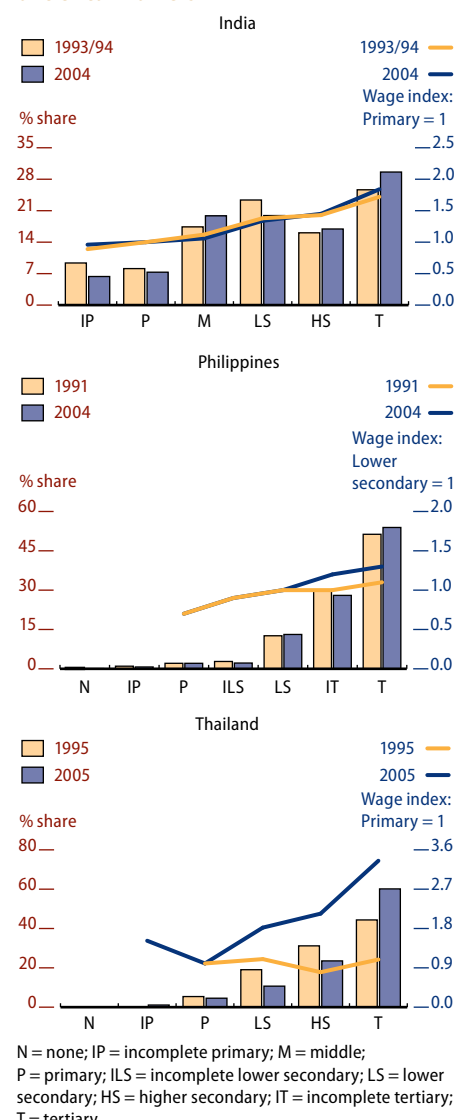


Note: Limited to those reporting wages.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

3.2.7 Education profile and wage indexes of clerical workers



Note: Limited to those reporting wages.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Philippine Labor Force Survey, 1991, 2004, October rounds; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

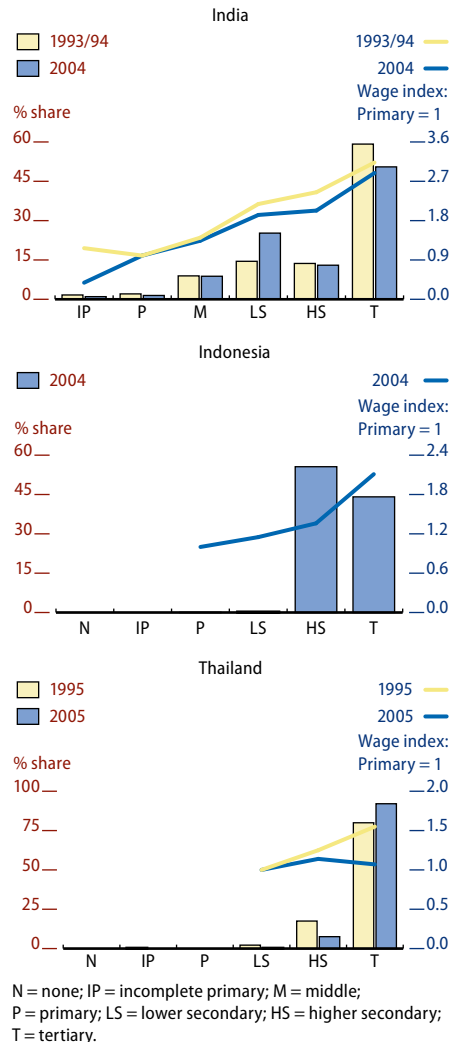
be hindering job creation and economic dynamism, thereby muting the pecuniary benefits of schooling.

It is often argued that it is in fact the limited supply of educated workers itself that is the constraint on economic dynamism. Surely growth of Filipino call centers and of IT-enabled services in India is hindered by a shortage of suitably educated workers? After all, call center managers informally interviewed for this work believe the employment opportunities in the sector to be substantial, if education bottlenecks can be overcome. This is certainly possible, and job creation in the sector would indeed bring benefits. However, there are at least three reasons against forging education policy based on the conclusion that raising target schooling levels will unleash transformation through high-end services.

First, as shown in this chapter, the employment shares of these sectors are extremely small, so projecting their capacity to create a large number of jobs involves tremendous out-of-sample extrapolation. Magtibay-Ramos et al. (2007) argue that to meet the forecast of the business process outsourcing (BPO) industry (and subsequently the Government) of 1 million BPO jobs in the Philippines by 2010, over one quarter of all new jobs would have to be in the industry—a historically unusual figure. Furthermore, other constraints, lurking just out of sight, may become apparent as the sectors expand. This is indeed one of the key lessons of the young literature on binding constraints to growth.

Second, the economic cost of bottlenecks should be considered. Certainly in India's high-end services, salaries have sky-rocketed to industrial-economy levels, and job retention is becoming harder as workers leave one job in the sector for more remunerative options elsewhere in the sector. In the Philippines call center business, the impact of education bottlenecks on productivity growth is much less clear. Call center salaries for college graduates range from \$250 to \$400 a month—or around two or three times GDP per capita—an attractive number, but perhaps less so for graduates of the nations' top universities.

3.2.8 Education profile and wage indexes of bookkeepers/cashiers

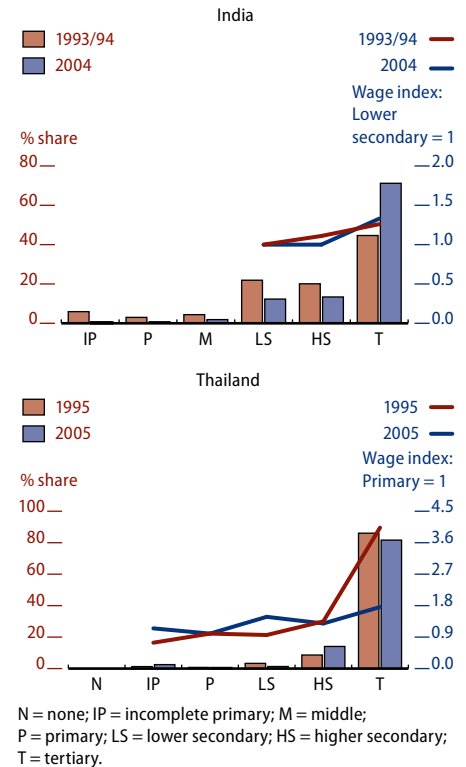


Note: Limited to those reporting wages.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Indonesia SAKERNAS 1994, 2004; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

3.2.9 Education profile and wage indexes of engineers and engineering technicians



Note: Limited to those reporting wages.

Sources: India National Sample Survey Organisation, Socio-economic Survey, Schedule 10, 1993/94, 2004; Thailand Labor Force Survey, 1995, 2005, October rounds.

[Click here for figure data](#)

As constraints on growth go, this is not particularly expensive. Moreover, employers report rising rates of absenteeism and that worker retention is becoming a problem. Anecdotally speaking, employees frequently leave the profession in favor of less remunerative jobs that do not require them to work the “graveyard shift.” Thus, the wages paid by the sector overstate the welfare improvement for workers.

Third, it is not obvious that the skills required in all of these professions are best obtained through general education. Several call center managers have expressed the view that their employees probably learned their English outside the classroom. Reports are starting to trickle in that firms in both countries are entertaining reasonable alternatives to college-educated workers. Some are establishing in-house training programs and report being satisfied with the results, while others are seeking high school graduates with the requisite skills. Despite the sector’s growth potential, these trends cast doubt on the relevance of this potential for education policy.

This chapter has therefore argued that policy advisers should price constraints to growth via the return to education before forging conclusions on education policy. This being done, it takes no issue with the view that some select groups of educated workers are in short supply and that this is a constraint to growth.

One final issue concerns the quality of education. Results from the labor force surveys are only representative of the quality of education typically available in each country. Certainly, raising the quality of education might increase the returns to schooling and probably would be helpful for igniting growth. Lacking data on school quality, this chapter cannot speculate on these issues. It is certainly possible—even likely—that higher-quality education will precipitate higher rates of investment and job creation, particularly in industry and services. This point made, and given that returns to the types of basic education available have fallen fast, this chapter concludes that it is mainly by measuring and credibly delivering improvements in quality that basic education projects could contribute directly to structural change and growth.

These caveats notwithstanding, the employment numbers provided are quite sobering, and caution against mechanically raising general education targets in the hope of generating growth. Certainly other reasons exist for raising education levels. But expectations of the contribution of education to structural change must be rooted firmly in a thoughtful, empirical understanding of what workers are likely to do with their education. The evidence provided suggests that when economies or sectors stagnate, the availability of jobs and new technologies may do more for many than more time in the classroom.

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Datasets used and sources

Country	Source	Date
India	Socio-Economic Survey, Schedule 10, National Sample Survey Organisation, India	1993/94 (Round 50), 2004 (Round 60)
Indonesia	SAKERNAS, Badan Pusat Statistik, Indonesia	1994, 2004
Philippines	Labor Force Survey, National Statistics Office, Philippines	1991, 2004 October rounds
Thailand	Labor Force Survey, National Statistics Office, Thailand	1995, 2005 October rounds

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