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Education in Southeast Asia: Investments, Achievements, and Returns

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Education In Southeast Asia: Investments, Achievements, And Returns[1]

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Abstract

Education and economic growth are highly complementary, especially in middle-income economies. In this chapter we review the performance and prospects for education in developing Southeast Asian countries. The prior Northeast Asian experience underlines the importance of investing in human capital ahead of growth in demand. Other than in Singapore, Southeast Asia's record is much less bright in this regard. In most of the region, shortages of qualified skilled workers threaten to impede transitions through middle income. The one exception is the Philippines, a remittance-oriented economy where growth in the supply of skills has long exceeded expansion of domestic demand.

We begin with a brief summary of basic data on educational achievement, public funding and access. We then present more detailed discussions on two contemporary issues: the influence of rapidly changing economic conditions on returns to educational investments, especially as the region's economy becomes more closely integrated in Asian and global production systems; and the potential impediments to human capital accumulation posed by limited demand for education. Demand is constrained by opportunity cost, and in some cases by distortions in the market for capital, a factor complementary with skills. We conclude with a brief assessment of the regional outlook for human capital growth and implications for economic development and policy.

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1. Introduction

Human capital investments have played a crucial role in the early economic success of East Asian economies. In *The East Asian Miracle*, an important early investigation into the sources of the region's rapid economic growth,[2] the World Bank (1993) stated that

> "The growth and transformation of systems of education and training … has been dramatic … the HPAEs' enrollment rates have tended to be higher than predicted for their level of income … By 1987, East Asia's superior education systems were evident at the secondary level … Primary education is by far the largest single contributor to HPAEs' predicted growth rates … Physical investment comes second … followed by secondary school enrollment."

Given Southeast Asia's rapid growth, the claim has often been made that these countries too have benefited from high rates of human capital investment. This claim, however, is less robust for Southeast Asia, and even for the Southeast Asian "Miracle" economies, than for Northeast Asia. In an important region-wide survey, Anne Booth (2003) described the claim that the Southeast Asian economies invested heavily in education at an early stage and in an equitable manner as "gross over-generalisation." Even among the eight "Miracle" economies, she points out significant differences in the timing and extent of human capital investments between those in Northeast Asia (Japan, South Korea, and Taiwan) and those in Southeast Asia (Singapore, Malaysia, Indonesia, and Thailand). In fact, human capital investments in Southeast Asia started late and have generally not achieved as much as in Northeast Asia: educational attainment has been lower while inequality in access to education has been severe (Booth 2003; Khoman 2005).

Taiwan and South Korea are among the world's most successful growth stories. Both countries quickly climbed up the production ladder toward the most technology-intensive production processes and by the late 1990s had achieved high-income status. In both countries, rapid expansion of their human capital helps explain their successful transition from middle to high-income (Eichengreen et al. 2013). Within East Asia, Japan, Hong Kong, Singapore, Taiwan, and South Korea are the technological leaders, with Japan the most advanced. South Korea most closely approximates Japan's manufacturing capacity, followed by Taiwan. Singapore is the only Southeast Asian country that has joined this group, but

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[2] The "Miracle" economies were identified as Japan, Hong Kong, South Korea, Singapore, Taiwan, Indonesia, Malaysia, and Thailand.

together with Hong Kong, it is the furthest behind Japan (World Bank 2012:11).

Thailand, Malaysia, and Indonesia have made impressive progress in economic growth and poverty reduction, but their movement up the production quality ladder slowed after the Asian Financial Crisis. They still occupy predominantly low-value-added niches of manufacturing such as assembly and processing. They are still some years, or in the case of Indonesia perhaps decades, away from becoming leading industrial nations (World Bank 2012: 11). Eichengreen et al. 2013 have presented evidence that growth slowdown or the middle-income trap is less likely in countries where the population has a relatively high level of secondary and tertiary education and where high-technology products account for a relatively large share of exports. If this is so then it seems clear that for Thailand, Malaysia and Indonesia, the lack of high quality human capital helps to explain their growth slowdowns.

It is against this background that we consider human capital in the growth and development of Southeast Asian economies. Human capital includes both health and education, but due to space limitations we will discuss only education (for more on health see the chapter by Nobles in this volume). The chapter has three primary goals. We first review recent educational data for Southeast Asia. By the early 1990s, most governments in the region had conceded that their human capital investments had fallen short of what is required to sustain a high growth rate. Most emphasized the need to prioritize education (especially higher education), to sustain growth. Did this translate into policy changes, and has Southeast Asia been successful in catching up with Northeast Asia? We also expand the analysis to include the poorer Southeast Asian economies. Some of these, such as the Philippines, were not classed as HPAEs by the authors of the *East Asian Miracle* study. Others, including Vietnam, Laos and Cambodia, started to grow and integrate with the global economy at least a decade later than their neighbors, in the early 1990s. Their delayed entry to the global economy has had significant implications for their growth strategies and for their efforts to increase the supply of human capital.

Second, we note that conditions in the world economy have changed significantly since the HPAEs underwent their growth accelerations. What are the implications of new global trading arrangements and configurations, including the rise of China as a key player in regional trade, for human capital incentives and policies in Southeast Asia?

Third, with these insights in hand, we examine human capital policies using examples from

the Philippines, Vietnam and Indonesia. A short concluding section brings the chapter to a close.

2. The supply of education and human capital

In this section, we examine changes in educational achievements in Southeast Asian countries, focusing most closely on developments in the early years of the twenty-first century.

2a. Quantity of education

In aggregate data, the primary school net enrollment rate (NER), which measures the population's basic education level, is one of the most important widely accessible indicators of educational achievement. Increasing primary NER is a general trend observed in most developing countries. By the late 2000s, near-universal primary school enrollment has been achieved in most countries of East and Southeast Asia and Latin America, though other regions still lag behind (UNESCO 2010, Table 2.2). Except for the Philippines and Laos, most Southeast Asian countries' primary NERs were at least 90% by 2008 (see Figure 1).

Figure 1: Primary School Net Enrollment Rates (%)

The NER, however, does not tell us whether children actually complete primary school. Nor does it indicate where children are in the cycle, or whether they dropped out and returned. Table 1 shows the rate of survival to grade 5. Malaysia and Singapore are the only countries with rates close to 100%. Other Southeast Asian countries, including Cambodia, Laos, Myanmar, the Philippines, and to a lesser extent Indonesia, are lagging on this measure. In Laos, less than 70% of children reach grade 5. These data suggest that the simple NER overstates the success of Southeast Asian countries in providing basic education. There is much more work to be done to keep children in school and help them complete primary education.

Table 1: Survival rate to grade 5

Another widely accessible indicator, the mean years of schooling, tells us a little more about the extent of basic education. Figure 2a shows that in the 1950s and 1960s, Southeast Asian countries and Northeast Asian countries started out with similarly low levels of education (about three to four years per person, on average, for most countries in both regions). Twenty years later, average schooling in South Korea and Taiwan had leaped significantly ahead, creating a major gap in educational levels between Northeast Asia and Southeast Asia.

Figure 2a: Mean years of schooling for population age 15+

We re-examine data on mean years of schooling in Figure 2b, taking into account the fact that in any given year, countries were at different levels of development. Using data on gross national income per capita (constant international prices of 2005), we choose comparable base years for countries. Lao PDR and Cambodia in 1995 were comparable, in per capita incomes, to Vietnam in 1990, Indonesia in 1970, Thailand in 1965, China in 1985, the Philippines in 1960, and Malaysia, Singapore, and South Korea in 1955. Figure 2b shows a similar story as in Figure 2a. Even after taking into account countries' levels of development, South Korea's human capital development was ahead of that of most Southeast Asian countries. It's interesting to note that within Southeast Asia, only Vietnam's human capital development seems more in line with that of South Korea when this country was at similar stages of development.

Figure 2b: Mean years of schooling for population age 15+ for comparable stage of development (based on GNI per capita)

During the 1980s and 1990s most Southeast Asian governments made major efforts to broaden and deepen the supply of educational opportunities. In Indonesia and Thailand, for example, governments pledged in the early 1990s to achieve the goal of nine-year education for all. Region-wide, these efforts led to increased expenditures on teacher training, construction of new classrooms and upgrading of existing school facilities. The results can be seen in a rapid increase in average years of schooling of almost all countries in the region between 1980 and 2000. Despite such improvements, however, by 2000 average years of schooling in Southeast Asian countries were still well below those attained by South Korea and Taiwan two decades earlier. Korea, for example, attained a secondary net enrolment rate of 60% in 1978, but this level was not reached by the Philippines, Thailand, or Indonesia until well into the 2000s, and as of 2010 had yet to be attained in Myanmar, Lao, Cambodia, and Vietnam.[3] Moreover, the growth rate of educational achievements in the decade to 2010 has often been slow or uneven, making it even harder to close the gap with Northeast Asia. In Thailand, for example, public education expenditure as a share of GDP declined from its peak of 5.4% in 2000 to 3.8% in 2010, in spite of robust GDP growth during most of those years. Similar slippage in educational investment rates has been noted in several regional countries

[3] Source of data: World Development Indicators Online, accessed 10 July 2013.

at various points in the past 20 years (Booth 2003).

The lower average schooling rate of Southeast Asian countries is a result of lagging enrollment rates in both secondary schools and tertiary education. As can be seen in Figure 3, by 2000 secondary school net enrollment rates in South Korea's and Taiwan were approaching 100%, significantly higher than Southeast Asia and other middle-income countries and even higher than the average for OECD countries. In Southeast Asia, Singapore is the only country that has attained universal secondary school enrollment.[4]

Figure 3: Secondary School Net Enrollment Rates (%)

The importance of higher education cannot be overemphasized. It delivers skills and research for productivity and innovation, both of which are critical for long-run economic growth. The gap in tertiary education between Northeast Asia and Southeast Asia (and China) is even more staggering than the gap in secondary education. Figure 4 shows that in 1973, South Korea's gross enrollment rate (GER) in tertiary education was just as low as in Southeast Asia or in a typical middle-income economy. Yet by 2001, this rate had shot up to well over 80%, leaving all the Southeast Asian countries behind. Moreover, there was almost no gap in schooling attainment between urban and rural areas: access was relatively equal (Zhang et al., 2012). By 2010, South Korea's tertiary GER reached over 100%—one of the highest in the world, surpassing even the other OECD countries. Similarly, Taiwan started out in 1973 with a higher tertiary GER than most other countries in Asia except the Philippines. The rate of increase was slower in Taiwan than in South Korea, so by 2001 and 2010, Taiwan's tertiary GERs were below South Korea's. Even so, the expansion of Taiwan's tertiary education was significantly faster than in most Southeast Asian countries. Even in Singapore where educational achievement is the highest in Southeast Asia, the rate of enrollment in tertiary education is well below that of Taiwan.[5]

While there have been notable recent increases in tertiary GER in Southeast Asia (notably Malaysia and Singapore) and in China, the growth rate has not been high enough to allow for

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[4]Data on Singapore's secondary school enrollment rate are seldom available in international datasets, but according to that country's Ministry of Education, Singapore has achieved near universal education at primary and secondary levels (http://www.moe.gov.sg/initiatives/compulsory-education/ accessed March 19th).

[5]According to ILO data, it was 34% in 2002. http://www.ilo.org/public/english/region/asro/bangkok/skills-ap/skills/singapore_tertiary_education.htm.

catch-up.

Figure 4: Tertiary Gross Enrollment Rate (%)

The slow improvement in tertiary education is exacerbating skill shortages in many Southeast Asian countries, although the situation does vary by country. According to a recent World Bank report (2012), there are clear quantity gaps; that is, there are simply not enough skilled workers to fill the needs of the labor market, in Vietnam and Cambodia. These quantity gaps are revealed by a number of indicators: high and rapidly increasing education premium across sectors, high tertiary professionalization rate, low unemployment rate, significant time required to fill professional vacancies, low ratios of tertiary educated workers, and low tertiary GER. Hence a supply push is strongly needed in both Vietnam and Cambodia to increase the number of graduates. In Thailand, there is also an overall quantity gap in the skilled labor market but not because of low tertiary GER as in the previous group of countries (and hence the policy recommendation for these two countries is not a supply push). Rather the problem seems a lack of tertiary education of the current adult population. In Indonesia and the Philippines, there are quantity gaps in specific sectors (manufacturing in Indonesia and services in the Philippines), so there is a need for reallocation of skilled workers across sectors.

2b. Quality of education

Quality of education in most Southeast Asian economies is low. Expansion of education has often been achieved at the cost of quality.

Measures of educational quality are hard to identify, since there are few natural experiments to control for unobservables such as student quality and motivation. Accordingly, most measures are of inputs, in the belief that these are correlated with output. One such measure is public education expenditure per pupil. Figure 5 shows that once again, Southeast Asian economies have lagged behind their Northeast Asian counterparts. This is partly because South Korea and Taiwan both have much higher per capita income, which enables them to spend more per student. Figure 6 shows public expenditure per pupil as a percentage of GDP per capita. As expected, after controlling for differences in per capita GDP, Southeast Asian countries spend as much per pupil as South Korea. But it is worrying that for a number of Southeast Asian countries (Malaysia, Thailand, the Philippines, and Cambodia), this number declined in the 2000s, a trend that is certainly against the goal of catching up in human capital investment and achievement. There are also concerns in these countries about the quality of

educational services per unit of expenditure.

Figure 5: Total Public Education Expenditure per pupil (2005 international dollars)

Figure 6: Public Expenditure per pupil as percentage of GDP per capita

Other measures of educational quality at primary level are pupil/teacher ratio and the proportion of teachers trained. These are shown in Table 2. Most Southeast Asian countries have made progress in decreasing the number of pupils per teacher in primary schools to 20 or less by 2010, which is lower than for most other developing countries. The exceptions are Cambodia, Laos, and the Philippines, where this ratio has remained persistently above 30. Cambodia, where the ratio is as high as 48, faces a crisis of teacher availability.

Table 2: Pupil/teacher ratio in primary education

How well do educational experiences translate into abilities or skills? Among the few internationally comparable measures of realized educational quality are standardized test scores such as the Program for International Student Assessment, or PISA.[6] The most recent 2012 round of PISA evaluations covered 65 countries, including five in Southeast Asia (Indonesia, Thailand, Malaysia, Singapore, and Vietnam). Out of these 65 countries (including many developing countries), Indonesia is almost at the bottom of the list, while Malaysia and Thailand are near the bottom. Singapore was among the very top performers at 2nd rank. Vietnam also ranked remarkably high at 17th place, above OECD averages on all three tests including math, reading, and science (PISA 2012).

These indicators of educational quality should be interpreted with considerable caution. While low expenditure per student, high pupil/teacher ratio, low survival rate to grade 5, or poor performance on international standardized tests certainly raise concerns over the quality of education, high performance in these areas does not necessarily imply high quality of education. Reliance on quantitative assessment methods as guides to the design of education policy can lead to a preference for intensive drilling and coaching practices at the expense of

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[6] For more information on PISA methodology visit http://www.oecd.org/pisa

pedagogical approaches that promote creative and critical thinking and other essential skills. This problem is well acknowledged in Singapore, a country with stellar performance in most indicators of educational quality, whether expenditure per student, graduation rates, or performance on international standardized tests. This led the Singaporean government in 1997 to adopt a policy initiative named Thinking Schools, Learning Nation. This aimed for desired learning outcomes such as creative, critical, analytical, and flexible thinking, the exercising of initiative, communication skills, problem-solving, cooperative team work, and research skills (Tan 2013: 170). However, it's questionable whether such a program can really promote higher-order thinking skills in an education system where student success is still judged primarily on performance in exams.

Vietnam's surprising performance in the 2012 PISA raised many questions (The Economist 2013). On the one hand, it might reflect the fruit of Vietnam's educational investment. On the other hand, it masks many on-going problems in the country's educational system. For example, the high score may be a result of Vietnam's low retention rate, so that many weaker students drop out of school and hence were not included in the sample for PISA testing. Many Vietnamese education specialists argue that the score does not reflect the fact that Vietnam's educational system, as in the case of Singapore, emphasizes rote memorization and passing exams over critical and creative thinking.

Of course, one reason for low and slowly rising indicators of educational quality, especially at primary and lower secondary levels, is the rapid expansion of schooling infrastructure and resources in order to raise enrolment rates. This rapid expansion has, it seems, often come at the cost of lower quality overall. Indonesia, for example, took advantage of its oil export windfalls in the 1970s to embark on a massive school construction program. This succeeded in raising primary school enrolment rates and average years of education for primary-school-age students. However, the construction of schools and other physical infrastructure greatly exceeded the rate at which properly qualified teachers could be trained. In the 1990s, the government once again implemented a similar school construction program, this time to increase facilities for lower secondary education. The same successes and mistakes can be observed, as rapid expansion of schools leads to recruitment of under-qualified teachers (Baunto 2011: 59). In recent years, quality of education has remained low in Indonesia. According to some studies, infrastructure is deteriorating and indicators such as teacher qualifications and classroom quality need to be improved (Granado et al 2007).

If educational quality is poor at the lower schooling levels, it's not surprising that it is also widespread at tertiary level. Universities in Southeast Asian countries have low international rankings. Only two regional universities, both located in Singapore, appear in the top 500 global rankings compiled by Shanghai Jiao Tong University.[7] Functionally, institutions of higher education in low- and middle-income East Asia (Southeast Asia included) are widely judged to have failed in their mandates to deliver skills to match labor market needs and produce research for innovation (World Bank 2012).

2c. Access to education

Equality in access to education matters, because it is a social injustice that disadvantaged groups in the population should have fewer opportunities. It also matters because no country can afford to waste talent. They must be able to draw from wide talent pools to supply their labor markets with the most skilled and productive workers and to promote innovation and technological development. This is a matter of survival as the global economy becomes increasingly knowledge-intensive.

To measure contemporary equity in access to education, we compare mean years of schooling for populations aged 17-22 across different groups. Table 3 below shows that by the early 2000s, many Southeast Asian economies had closed the educational gap between males and females. Female to male ratios of mean years of schooling were around one in Indonesia, Myanmar, the Philippines, Thailand, and Vietnam. Cambodia and Laos were the only two countries with significantly lower ratios (0.74 for Cambodia and 0.73 for Laos in 2000). By the later half of the decade, educational inequality by gender improved in both countries, as the ratio increased to 0.97 in Cambodia in 2010 and 0.92 in Laos in 2006.

Table 3: Mean years of schooling for population aged 17-22 by gender

While most Southeast Asian countries have made respectable progress in eliminating gender inequality in schooling, improvements in other dimensions of educational inequality have been slower. In particular, rural areas are severely underserved with schools and teachers relative to cities and towns. Although there was a declining trend in the rural-urban gap in educational achievement in many Southeast Asian countries during the 2000s (see Table 4),

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[7] http://www.arwu.org/ARWU2010.jsp, accessed 16 July 2013.

the gap nonetheless remained high. The situation in Laos is especially severe. Mean years of schooling of the rural population were less than half of that of the urban population in 2000. The situation improved by 2006 but mean years of schooling of rural population remained well below that of the urban population. In the Philippines, the rural-urban ratio of mean years of schooling did not improve. And there remains stark regional disparity: in the best performing region (National Capital Region), 84% of the population has reached (although not necessarily finished) secondary education, whereas in the lowest performing region (Autonomous Region of Muslim Mindanao) it is just 45% (Mesa 2007). Of course, positively selected internal migration accounts for some of the regional gap. But this merely begs the question why more educated workers should need to move in order to realize a return on their skills.

In Indonesia, rural-urban disparity has declined, but only slightly, and still persists within provinces and between districts, particularly at the primary level. The disparity in enrollment rates among provinces decreased from 54% in 1997 to 30% in 2002, and disparity within provinces increased from 46% to 69.5%. The problem is more pronounced at junior high and senior high school levels. Among subnational jurisdictions, richer districts spend much more on average per student, partly due to their wealth and partly due to the greater support for tertiary enrollment among these demographics. On the other hand, poorer districts tend to exert a greater fiscal effort as they allocate a higher proportion of their budget to education (Granado et al. 2007).

Table 4: mean years of schooling for population aged 17-22 by rural vs. urban

In Thailand, the distribution of public education expenditure is skewed. Public spending per pupil on education in poor provinces is lower than in rich ones, and certainly lower than in the capital city, Bangkok. The consequence is that education accessibility differs starkly across regions in all levels, with Bangkok and the adjacent eastern region being more privileged than the northeast part of the country. Students in Northeastern Thailand get the lowest education subsidy per head at most education levels, except pre-school and primary school. As a result, perhaps, this region has the smallest number of students that graduate with “good level” in the O-NET test (Ordinary National Education Test) for lower secondary school and the A-NET test (Advanced National Education Test) for upper secondary school, credentials that are very important in determining a student’s qualification for further education. Meanwhile, among all regions of the kingdom, the northeast region also produces

the greatest variation in test scores among its schools (Laovakul 2009). This and other regional discrepancies in development-oriented public spending provides a key to understanding the deep political divisions in Thai society, which erupted into violence and extreme political instability in the md-2000s and show no sign of abating.

Table 5 shows that there was not one common trend in educational inequality by income groups among Southeast Asian countries. In Vietnam, inequality in years of education among different income groups clearly declined between 2002 and 2010. In Indonesia and the Philippines, inequality by this measure was unchanged. However, according to Granado et al. 2007, in Indonesia inequalities remain at the junior and senior secondary levels, but have diminished at primary level. Despite lack of access to lower level of education by the poor, public education expenditures are skewed toward tertiary level, accounting for a higher percentage of government spending than in most other countries. In Cambodia, the trend in educational achievement across income group is unclear, as the gap in mean schooling years widened between the three middle quintiles and the lowest quintile, but narrowed between the richest and the poorest quintiles. It's clear from Table 5 that of all Southeast Asian countries for which we have data, Laos has the highest inequality in educational achievements by income level. During the 2000s, this inequality became much worse.

Table 5: Relative mean years of school for population aged 17-22 by income quintile

Finally, it is important also to note that access to education is differentially affected by major economic shocks. During the Asian Crisis years, wealthier households were better able to smooth consumption, by borrowing and drawing down savings, than were poorer households. Studies from Indonesia clearly show poorer households responding to lower real earnings by increasing household labor supply and reducing discretionary spending. As a result, while all but the richest quintile of households reported reduced lower enrollments and educational spending for school-age children, declines were largest among the poorest households (Thomas et al. 2004). Income-elastic spending on education by poor households leaves their children vulnerable to macroeconomic shocks in ways that are qualitatively dissimilar to wealthy households, and which are likely to have lasting effects on their labor market mobility and earnings as adults.

2d. Summary

In the most rapidly-growing Southeast Asian economies, the onset of the Asian Crisis in 1997 was at least partly a consequence of underinvestment in education that impeded the transition

from labor-intensive to more skill-intensive activities as real labor costs began to rise. Since recovering from the crisis, Southeast Asian countries have continued to make progress in expanding overall access to education and raising average educational levels, following trends established in the pre-crisis era. By the end of the 2000s, most countries in the region had achieved universal or near universal primary school enrollment. However, much work remains to raise primary school retention and completion rates. Secondary and tertiary school enrollments have also increased steadily, and as a result, average years of education among the population aged 15 and older continue to rise. Despite such progress, however, the gap in educational levels between Southeast Asian countries and their counterparts in Northeast Asia, in particular South Korea and Taiwan, remains high.

Progress on quantity measures, however, tends to mask a more serious problem: the quality of education in Southeast Asian countries remains low at all levels, and there has not been much improvement in the past 10 years. Low-income countries, including Laos, Cambodia, Myanmar and to a lesser extent Vietnam, lag far behind the others in both overall access to education and in quality of education. They are on par with (or in the case of Vietnam, only slightly above) averages for low and lower middle income income countries. But they are well below levels reached by Taiwan and South Korea at comparable stages of those countries' development.

With regard to education inequality, most Southeast Asian countries have made respectable progress in eliminating the gender gap in education, but disparities in other dimensions persist. Inequity in access to education is especially bad in Laos, where indicators of education inequality are the highest in Southeast Asian region, and some indicators even worsened during the 2000s. School enrollments and expenditures among poor households remain vulnerable to negative shocks from the macroeconomy or labor markets. An implication is that greater volatility from the global market may in the long run produce greater separation in educational outcomes between rich and poor households.

3. Growth, globalization and the demand for skills

The global economy has changed significantly since the 1960s. It has become more closely interknit, thanks to lower trade barriers and transport costs and the increasing influence of large developing economies like China and the other BRICs in international trade and capital markets. Recent global growth has had more than one relevant feature. It includes ongoing commodity price booms, intensified competition in global markets for labor-intensive

manufactures, increased international demand for skill-intensive intermediate goods, and the unbundling of production processes across international platforms. How does this new global context affect human capital development in Southeast Asian economies, especially the latecomers to globalization?

The emergence of China and India as major economic powers is a sea-change in international economic organization. The resulting changes in global factor endowments and trade patterns have already influenced Asian trade and investment patterns. These changes have introduced new complementarities as well as competition among economies. When China first began to attract large-scale foreign investment and expand its export-oriented labor-intensive manufacturing industries, there was widespread concern that it would become a major threat to the continuing economic growth of developing Asian economies. It is now clear, however, that for many Asian economies China's growth boom has generated a new dynamic, reflected in a pronounced acceleration in intra-Asian trade and regional economic integration (Eichengreen and Tong 2006; Athukorala and Kohpaiboon, this volume). India's increased growth and trade since the 1990s may hold the promise of an impending second round. Indeed, in the global recession of 2008-2010, the resilience and growth of these two giant Asian economies acquired even more prominence as a positive influence.

All Southeast Asian economies have been drawn into the China-centered international production network, resulting in some cases in major changes in production structure and the volume and direction of their international trade (Lall and Albaladejo, 2004; Coxhead, 2007). This reorientation toward China has had three big types of sectoral impact. First, the producers of labor-intensive manufactures have encountered intense competitive pressures—just as in rich countries. Second, natural resource exporters have enjoyed a sustained commodity price boom, global market fluctuations notwithstanding. Third, manufacturers of more skill-intensive goods such as parts and components for computers, mobile phones, and other electronic devices have found opportunities to expand through participation in so-called "fragmentation trade" (i.e. trade in parts and components for assembly into finished goods elsewhere) with China (see Athukorala and Kohpaiboon, this volume).

These changes affect each economy differently. The first of these impacts, that of intensified competition in low-end manufacturing and assembly, is obvious. The clearest feature of China's transition from near-autarky to integration with the global economy from the 1980s to the 2000s was the addition of several hundreds of millions of workers to the global supply

of low-skilled labor. As may be expected, this enormous shift raised the relative scarcity, and thus returns to, global stocks of all other productive factors— capital and human capital in particular. Two decades of historically unprecedented corporate profits worldwide, prior to the 2008 global financial crisis, speak to the extent of this effect. For labor-abundant countries, however, this change has of course been less positive. Global competition in the markets for labor-intensive products has never been more intense, nor profit margins in these industries thinner.

These conditions are fundamentally different to those faced by the earlier Asian globalizers, even as recently as the early 1990s. The implication is clear: whereas Taiwan, South Korea and more advanced Southeast Asian economies such as Malaysia and Thailand enjoyed over a decade of dominance in world markets in garments, footwear, and the assembly of simple electronics, the transitional contribution of exports based on such activities to economic growth in poorer Southeast Asian economies like Vietnam, Laos, Cambodia may be very brief indeed. The duration of their reign as key global producers of labor-intensive products will depend largely on exogenous factors, including global economic conditions, economic and policy innovations in other low-income countries, and in some cases the preferential trade policies of importing countries. This places a very high premium on efforts to ensure that the economy is prepared to move smoothly away from dependence on labor-intensive assembly as labor costs increase. Investments in human capital are without doubt at the top of this preparation list, since skills shortages constrain the transition from labor-intensive to skill-intensive processes. The combination of low skills and rising real wages was partly responsible for the sudden decline experienced by many of Thailand's key export-oriented manufacturing industries in the mid-1990s, a factor contributing to that country's economic crisis in 1997-98 (Warr 1999).

The second impact, the China-driven boom in global markets for natural resource products, is also quite clear, but the numbers are big enough to merit review. China is now the world's largest consumer of most of the main metals (accounting for a quarter or more of world imports), and a major consumer of energy. It is the largest world consumer of many agricultural products (including wheat, rice, palm oil, cotton and rubber), and the second largest in others (soybeans, soybean oil, tea). Between 1990 and 2003, Chinese demand for major metals grew at an average yearly rate of 14.7 per cent; from 1999 to the late 2000s it grew at over 17 per cent and absorbed around two thirds of incremental global output. For any country that is specialized in primary commodity production, China is a major export

destination and the primary driver of a sustained export boom. Most Southeast Asian economies are abundant in natural resources, especially relative to China, and regional resource exports to China have indeed risen greatly. This resource boom, however, can impose a penalty on profitability in other tradable sectors, for whom real exchange rate appreciations and the spending effects of a resource export boom make it harder to compete in domestic factor markets and the global product market. These effects are widespread, but were most noticeable in Indonesia during the 2000s (Thee 2011). Other than mining, which accounts for only a small fraction of employment, agriculture and natural resource sectors are not skill-intensive relative to manufacturing processes, nor do earnings in those industries reward skills as highly (Di Gropello, Kruse and Tandon 2011, Figure 2.6).[8] The relative decline of growth in the manufacturing has also slowed growth of demand for skills, other things equal, and with it the premium on higher education and specialized training. In addition, the spending effect of the resource export booms has driven up prices and employment in many low-skill non-traded industries, particularly construction and personal services, which offer exceptionally low returns to skills (ibid.).

The third impact of China's growth and globalization on Southeast Asia's human capital markets is more subtle. As global trade barriers and transport costs have fallen, firms have been quick to abandon the vertically integrated manufacturing model, in which all (or nearly all) stages of production take place within the borders of a single country. Increasingly, parts and components, especially of electrical and electronic products and machinery, are manufactured in specialized plants located wherever economic logic or business expediency dictates, then shipped to China or another low labor cost location for final assembly and packaging. The wealthy Northeast Asian economies (Korea, Japan, and Taiwan) and Singapore are leaders in this trade, and upper middle-income Southeast Asian economies such as Malaysia and Thailand have developed significant exports of skill-intensive electronics parts and components to assembly plants in China. The more China's factories grow, the more they draw in imports from locations such as these. So long as China's economy continues to expand, and so long as it maintains its preeminent position as the preferred location for labor-intensive assembly operations, countries that can occupy

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[8] A large global literature finds similar results elsewhere, notably that education has little or no impact on productivity or wages for on-farm work, though it does have an impact in non-farm employment (Fafchamps and Quisumbing 1999; Yang 1997).

specialized, skill-intensive niches in the parts and components trade will be beneficiaries.

4. Human capital policy

Policies to develop human capital can be approached from both supply and demand side. From the former, since human capital is the scarce factor of production in low and middle-income economies, solving supply constraints and increasing access have typically been the primary concerns of most studies of education and education policy. In sub-section 4a, we discuss the efforts of SEA countries in addressing such concerns.

But resolving supply constraints only is insufficient, because strong incentives to invest in skills and education are needed to stimulate the demand for schooling. These incentives are largely determined by the returns to skills or education. The literature on the returns to education is large, and there is generally much heterogeneity in estimated returns depending on the data set used, the country studied, and the empirical strategy employed. For lack of space we do not summarize estimates of returns to education in Southeast Asia here. Instead, we focus on discussing whether and why the returns are optimal or distorted, and their implications. In sub-sections 4b, 4c, and 4d, we present three country examples: the Philippines, Vietnam, and Indonesia. In all three, there exist macroeconomic and development policies that are not related directly to education but can nevertheless exert a significant impact on returns to schooling. As a result, these policies influence the accumulation of human capital and pose challenges to long-run economic growth.

4a. Educational investments in Southeast Asia

The perception of high social gains to educational investments motivates separate study of public investment in this sector. When educational investments are measured public expenditures on education (the most widely available metric), Southeast Asia does not stand out from other developing regions (Orazem and King 2008). In the 2000s most Southeast Asian countries other than Malaysia had below-average public spending on education as a percentage of GDP when compared with other developing countries (Table 6). In Thailand and the Philippines, public educational spending as a percentage of GDP even declined from 1999 to 2010. For Indonesia, Thailand, and the Philippines, average real annual growth rates from 1999-2010 were disappointingly low—especially so for the Philippines. Per capita public spending on education in Indonesia and the Philippines were also lower than the average of lower middle-income countries, while Thailand's level is lower than the average of upper middle income countries.

Table 6: Public spending on education

Malaysia is an exception to the above trend. That country has maintained a high level of public educational expenditure, usually at least 5% of GNP, for several decades. As a result, its per capita education spending is also higher than the average for middle-income countries. This is partly because education is not just an economic policy in Malaysia, but also a social policy, as the government seeks to "unify various racial groups in national building through education" (Loke and Hoon 2011: 95). But there is concern over the cost-effectiveness of this high level of government spending on education (Booth 2003: 188).

Cambodia and Laos significantly increased their human capital investments during the 2000s. In 1999, both countries had very low per capita spending on education. By 2010, both had caught up to the average level for low-income countries. This improvement was thanks to the increase of public education spending from 1% of GDP in 1999 to about 3% in 2010, coupled with rapid economic growth during this period. The end result was very high growth rates in public education spending during 1999-2000. Since the two countries started from very low levels of educational spending, however, there is still a large gap between them and the rest of Southeast Asia, as we will see below. Vietnam is another country whose government significantly stepped up its budget on education during the 2000s, from 3.5% of GDP in 1998 to 5.5% in 2010. As a proportion of total state budget, spending increased almost every year during the 2000s, from 15.5 in 2001 to 20% in 2009 (Vu 2012: 48).

Indonesia is another country to undergo an exceptional rate of increase in education spending. A constitutional amendment in 2002 required that government at all levels devote no less than 20% of spending to education. Given the very low initial level, this goal, which has taken a decade since to reach, has in effect elevated public educational spending in Indonesia into the lower mid-range of comparable countries. Even after this massive shift in the allocation of public spending, however, Indonesia spends less per student (as a share of GDP) at both primary and secondary levels than do most regional economies (Al-Samarrai and Cerdan-Infantes 2013).

Singapore's public educational spending stayed at around 3% of GDP during the 2000s. But because of a high GDP growth rate, the absolute level of education spending by the Singaporean government has risen faster than the world average. As a result, there was a substantial increase in per capita spending on education, from US$738/person in 1999 to US$1,301 in 2010. This city-state has rapidly closed the gap with other high-income

countries in per capita education spending.

In summary, during the 2000s, Southeast Asia's record in educational investments was not particularly impressive because their public spending on education as a percentage of GDP was below the average of all developing countries. However, within the decades, many countries in Southeast Asia including Laos, Cambodia, Vietnam, Indonesia, and Singapore, significantly increased their public educational expenditure, which probably explained these countries' increase in access to education especially at lower levels. But as seen in section 2, increased access often came at the cost of quality of education. Furthermore, educational achievements in Southeast Asian countries continued to lag behind their neighbors in North East Asia, even when comparing at comparable years of development.

Even if Southeast Asian countries succeeded in pushing up the supply of their educated workers in both quantity and quality, there remain other barriers to successful human capital development. We next present examples from the Philippines, Vietnam, and Indonesia to examine economic and development policies that may not directly relate to human capital but can still have strong influence on its outcome.

4b. The Philippines: returns to skills and brain drain

The Philippines experience makes it sadly clear that increases in the supply of educated workers are not a panacea for growth if they do not have opportunities to put their skills to work at home. We have already seen that the Philippines, one of the region's poorest performers in long-term growth, has also had very high indicators of educational achievement. Until the 1990s, it was the regional leader in tertiary enrollment rates. In the 1970s, the Philippine tertiary gross enrollment rate (GER) averaged 18.5% while in other countries it remained in the low single digits. Only in the 1990s did tertiary GERs in Singapore, Malaysia and Thailand begin to surpass those in the Philippines.[9] Thus the Philippines, as with some South Asian countries, has experienced a brain drain—that is, it has become a net exporter of skilled labor in spite of its lower-middle income status.

The proximate causes of this discrepancy are not hard to identify. Several decades of persistent and severe macroeconomic and policy instability in the Philippines discouraged

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[9] Source: World Development Indicators Online, accessed 22 July 2013.

fixed investment, and the resulting lack of installed capital effectively compelled skilled workers to seek higher returns through emigration. From the 1970s through the 2000s, gross fixed capital formation (GCFC) in the Philippines was appreciably lower as a fraction of GDP than in any of the large Southeast Asian economies, averaging 21.7% as compared with 24.2% in Indonesia, 27.9% in Malaysia, 28.4% in Thailand, and 33.3% in Singapore.[10] Over the decades, high rates of educational achievement, initially perhaps due to strong cultural predispositions, have come to reflect the recognition that productive employment requires emigration, and that schooling—and preferably a tertiary or vocational credential—is the key to winning a well-paying job abroad. As a result, about ten percent of the Philippine population lives abroad, and remittances from overseas Filipinos, at about 13% of GDP, were until very recently the country's largest single source of foreign exchange earnings, and exceeded FDI inflows by many multiples. Moreover the ratio of skilled to less-skilled workers among Philippine workers abroad has risen over time, by the 2000s exceeding one-third of all emigrants (Burgess and Haksar 2005).

The problem of brain drain has been extensively researched and is reasonably well understood. Less has been written on determinants of growth in the demand for education, especially at post-primary levels where most Southeast Asian countries fall below predicted enrollment and completion rates. In rapidly growing economies the opportunity cost of staying in school can be very high, and the returns to additional years of education may be low when most employment growth is concentrated in farming, resource sectors and light manufacturing. Moreover those economies in which the burden of distortionary development policies is relatively great face larger challenges. Vietnam and Indonesia embody both types of challenge; hence their cases merit closer attention.

4c. Vietnam: factor market distortions and the demand for training

In section 2 we presented evidence that although Vietnam's educational investments and achievements have exceeded those of other developing countries at comparable income levels, the country still lags far behind other Southeast Asian economies, and its human capital base is still weaker than required to escape the middle-income trap. A straightforward policy recommendation is that Vietnam must increase its investment in human capital, or its

[10] Source: World Development Indicators Online, accessed 22 July 2013.

government must spend more on education. However, such a policy can only deal with supply-side constraints. In the case of Vietnam, there are further problems with the demand side, or the incentives to invest in education.

Since *doi moi* (or renovation) in 1987, the Vietnamese government has liberalized a number of markets and removed trade restrictions, contributing to the country's rapid economic growth and poverty reduction in the past two and a half decades. But while the government liberalized output markets, it retains substantially greater control over factor markets, i.e., those for land, labor and capital. Interventions in these critical markets have negative consequences for long-run economic growth and income distribution, including the incentives to invest in education. The connections (as we shall argue) are indirect, but nonetheless unambiguous.

Despite liberalization and privatization efforts, the state sector (that is, public administration as well as state-owned firms) continues to dominate the Vietnamese economy, and government policies continue to strongly favor state firms at the expense of private enterprise and the overall economy. State firms receive cheap credit from Vietnam's state banking system, and as in China and other well-known cases, this causes them to become excessively capital-intensive in their choice of technique relative to the economy’s overall factor endowments. Moreover, because capital and skills are complementary inputs, state firms therefore also employ more skill-intensive technologies. However, their hiring of skilled workers is limited. Few of these firms produce for the world market, so their growth is constrained by domestic demand, which has increased less quickly than exports. As in China, this combination results in the rationing of high-paying jobs in state-sector companies. This rationing in turn generates rents that add to the incomes of white-collar workers in state sector enterprises. Anecdotal evidence suggests that the price of entry to a state sector job can be as high as one or two years of salary, implying that such jobs are capable of generating substantial rents. Meanwhile, the capital-starved private sector, which has generated most new employment during Vietnam's transition, seeks mainly workers with lower-secondary school education and offers much lower rewards to higher levels of educational attainment. This system has several implications for the demand for high school and tertiary education.

First, returns to schooling at upper-secondary and tertiary levels are contingent on expectations of state employment. For wage earners, the state sector jobs return 5-9 percent higher earnings per year of education, compared with 3-4 percent per year in non-state

employment (Phan and Coxhead 2013a). Family connections are strong predictors of employment in state firms, so for the majority of students who lack such connections, the benefit-cost ratio of an additional year of schooling after middle school and into university is much lower. Schooling costs are a major financial burden on families, so policy-induced segmentation of the skilled labor market raises the dropout rate for among students who do not expect to have access to state sector jobs. This results in a lower overall rate of human capital accumulation.

Second, families with connections to state-sector employment invest much more heavily in their children's education (Coxhead and Phan 2013b). As long as the dichotomous labor market persists, conditions in Vietnam are ideal for a deepening inequality of income and opportunity between those who have the right family connections and those who lack them.

Third, the requirement of a university degree for most skilled state-sector jobs appears to have sparked a race for higher education credentials, rather than for skills as such. On the positive side, diplomas are among the few tangible benefits that most students can expect from Vietnam's largely unreformed higher education system (Chirot and Wilkinson 2010). But Vietnam's own Ministry of Education has estimated that only 30 per cent of those receiving university degrees are adequately trained for the jobs they seek.[11]

An additional implication of this two-track market for skills is that investments in Vietnam's educational infrastructure may be less productive than the government, and the international donor community that supports it, may expect. With only a limited number of high-paying jobs for skilled workers, high school retention rates and university enrolment rates may be constrained as much by low demand as they are by lack of buildings, teachers and learning materials.

What are the prospects for change? In 2012 Vietnam's government announced plans for reforms, which, if implemented, would reduce the privileges and influence of state-sector companies. But prospects for real progress in reform are clearly constrained by the complex and opaque politics of the one-party state. More positively, the capacity of private sector

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[11] http://www.reuters.com/article/2009/05/13/vietnam-education-idUSPEK46232520090513, accessed 13 May 2103.

firms to mobilise capital from non-state financial markets and from the world market has increased somewhat in recent years, and because greater access to capital also means higher demand for skilled workers, this trend should also help undermine the salary gap that so clearly drives differential returns to secondary and post-secondary education. However, the private sector is still very much on the losing end of Vietnam's financial policies, gaining little from credit expansions and suffering greatly when monetary policies are tightened to fight inflation.

The presence of wholly foreign-owned firms continues to grow (albeit from a very low base when measured by employment shares), and in time their expansion will also help create new demand for workers with applicable skills. Here, the constraint is of a chicken-and-egg type, in which greenfield investments by medium and high tech companies are discouraged by lack of a suitably skilled workforce. Foreign firms have addressed the skills shortage by training their own workers abroad,[12] and foreign institutions of higher education are also expanding in-country vocational training, but these are very costly ways to compensate for the failings of the country's own system of education.

Finally, there are a few signs that some domestic higher education institutions are finally beginning to acquire enough independence to design and offer meaningful curricula, often in partnership with foreign institutions, but their programs are also quite costly for most Vietnamese students. Vietnam's long-run development prospects are greatest if the problem of market segmentation leading to low educational incentives and diminished employment opportunities for skilled workers is addressed at its source.

4d. Indonesia: resource booms and returns to skills

Southeast Asian countries are relatively resource-rich but have evolved manufacturing sectors that are advanced by the standards of the developing world. Among these economies, however, Indonesia has lagged in terms of investments associated with productivity growth and progress up the technological ladder (Thee 2005; Frankema and Lindblad 2006; Timmer 1999).

In 1970-1996 Indonesia was one of only a few resource-rich developing economies

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[12] http://blog.oregonlive.com/higher-education/2012/08/portland_state_university_welc.html, accessed 13 May 2013.

worldwide clearly to escape the 'curse' of natural resource wealth. A relatively large share of their OPEC-era oil export revenue windfall was used for productivity-enhancing investments in other tradable sectors, notably agriculture and manufacturing (Pinto 1987; Coxhead 2007) and in other development activities, including a huge program of primary school construction begun in 1974, which had a small but statistically significant effect on human capital accumulation, as measured by earnings (Duflo 2001). Gains from these investments were consolidated in the 1980s, during a remarkable period of economic opening and internal reform that offset the negative effects of a huge fall in global oil prices. This momentum, however, has not been maintained in the post-Asian Crisis era in spite of a healthy rate of overall economic growth.

Indonesia's productivity growth rate, never high by regional standards, has diminished in the 2000s and now accounts for a negligible fraction of GDP growth (IMF 2011). Growth has instead been fueled by capital accumulation and resource exploitation. Industries whose growth has large effects on the demand for skills have languished. The principal reasons for Indonesia's low performance in skills-based industries have been identified by Bird and Hill (2006) as a relatively low policy weight applied to skills upgrading relative to other policies; lack of adequate educational and training infrastructure for production of skilled workers; and the "fundamental discontinuity" of the crisis itself and of the subsequent political upheavals and transition to democracy. To these three reasons we may add two more: the impact of China's expansion on Indonesia's tradable manufacturing sectors in general, and on labor-intensive and skill-intensive industries in particular (Coxhead 2007; Eichengreen et al. 2004), and the intersectoral effect of commodity market booms that have driven prices of some of Indonesia's key natural resource, agricultural and horticultural exports to all-time highs (World Bank 2007). As discussed in section 3, the effects of these sustained shocks are likely to have been substantial. At the same time, and by contrast with Thailand and Malaysia, Indonesia has been very slow to develop capacity to exploit opportunities in skill-intensive parts and components trade (Coxhead and Li 2008).

In a highly competitive East Asian regional economy, investments in vertically unbundled skill-intensive industries are highly sensitive to capacity, cost and efficiency. On investments in human and physical capital, Indonesia continues to lag behind its neighbors. As of 2000, only 5% of Indonesians over the age of 25 were recorded as having completed *any* kind of post-secondary education, compared with 7.5% in Malaysia and 11.3% in Thailand. FDI as a percentage of GDP was 2.7% in 2000, equivalent to Thailand and the Philippines, but far

behind Malaysia and even Vietnam. Indonesia's rankings on measures of logistics costs are unimpressive (Coxhead and Li 2008). Added to this, Indonesia's foreign investment rules have been notoriously unstable by regional standards. Foreign investors, at the skill-intensive margin have stayed away, for the most part, leaving Indonesia on the sidelines of the parts-and-components revolution.

Sluggish investment growth in manufacturing, and the associated loss of opportunities for productivity and efficiency gains through learning by doing (van Wijnbergen 1984), exporting (Sjoholm 1999; Blalock and Gertler 2004), and the hosting of foreign direct investment (Suyanto and Bloch 2009) also depresses returns to investments in human capital. As noted earlier, the sectors of Indonesian industry that have grown most quickly since the Asian crisis and with the rise of China are those in which skill premia are relatively low. Meanwhile educational costs remain high, and quality low.[13] So in addition to its difficulties in improving the (quality-adjusted) *supply* of education, Indonesia also faces a paradoxical shortage of *demand* for schooling. Both are important in determining whether the country succeeds in its efforts to decisively reduce poverty and transition to upper middle-income.

One very important reason to intervene in favor of a more skills-intensive pattern of growth has to do with dimming prospects for future natural resource-based growth (see Shively and Smith, this volume). The country's oil and gas reserves are nearing exhaustion, and its old-growth forests and fisheries are being rapidly depleted (Resosudarmo 2005). According to the World Development Indicators, Indonesia's 'genuine' savings rate, taking account of these and related environmental trends as well as net additions to the stock of human capital, is far below its measured savings rate based on the conventional System of National Accounts.

Though Indonesia is currently a marginal player in global high-tech markets, these markets are expanding very rapidly. There is scope to develop comparative advantage in niche markets in this area, if steps are taken to ensure that the economic and institutional conditions for productive investments are in place. The goal of sustaining and increasing output in skill-intensive sectors, as a means to avoid the middle-income trap, creates a mandate for

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[13] "The weight of evidence indicates that the quality of education in Indonesia is very poor. The catalogue of qualitative defects in Indonesian primary schools is long, and includes poorly trained teachers, high rates of teacher absenteeism, an emphasis on rote learning, insufficient textbooks, poor quality buildings and a lack of toilets and running water. The effect of such factors on the cognitive abilities of students is very important" (Suryadama and Jones 2013: 5).

interventions that promote FDI and encourage young Indonesians to stay in school. But whether this strategy can succeed depends on many factors—not least, the "inertia" built into attempts to change the educational profile of the labor force (Suryadarma and Jones 2013).

5. Conclusions

The global economy has changed significantly with profound implications for the role of human capital in economic growth and development. Our discussion in section 3 has made it clear that Southeast Asian economies, no matter at what stage of development, cannot afford to be slow in developing their human capital base. Singapore, the most advanced regional economy, needs to continue its efforts in human capital development to compete with other Asian technological leaders including Japan, Taiwan, South Korea, and Hong Kong. The two upper-middle income Southeast Asian economies, Malaysia and Thailand, must aggressively invest in human capital and upgrade technologies to take advantage of the fact that their production is complementary to China's, so that they can move up the production ladder and become leaders in some advanced industrial processes and avoid the middle-income trap. For low and lower-middle income regional economies that were latecomers to globalization (Vietnam, Laos, Cambodia, Myanmar, and to a lesser extent Indonesia), the threat of a middle-income trap is even more severe. The global mobility of production platforms in labor-intensive industries means that they can no longer rely on their abundance of unskilled labor to maintain the momentum of industrialization. They have to either find niches for their own products (to avoid direct competition with China and other low-cost producers), or find ways to make their products complementary to China's (to become players in the East Asian regional production system). At the same time, skills upgrading is now more important than ever, because one way to gain from regional integration is to quickly move into specialized intermediate goods. For this to happen, they must solve the skill supply constraint to avoid the new resource curse, in which they specialize in resource exports and forgo the chance to industrialize.

Recognizing the importance of a skilled labor force, many countries in Southeast Asia have stepped up their efforts in human capital development, expanding educational access, especially for primary and lower secondary school levels, and raising average years of schooling. However, they have performed much less well in raising educational quality and reducing inequality in access. And in every measure, they still lag far behind the achievements of their Northeast Asian neighbors at comparable stages of development. It

seems they also lag behind what is required to overcome the middle-income trap.

Moving forward, what recommendations can one make for Southeast Asian countries regarding human capital policy? Clearly, much stronger commitment to human capital development from the government, in the form of increased public spending on education expenditure, is a step in the right direction. However, to develop human capital requires much beyond spending more money to reduce supply constraints, since there must also be sufficient demand for skills and of the right kind. In some countries, the recommendation is to create policies that promote skill-intensive sectors and generate skilled jobs. In other countries, what is needed is less new policies than the removal of existing distortions that reduce the incentives to acquire higher education.

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Tables and figures for Chapter 12: Education in Southeast Asia

Table 1: survival rate to grade 5, 2009

Country/region	Survival rate (%)	Female/Male ratio
Cambodia	62	1.08
Indonesia	86	1.07
Japan	100	1
Lao PDR	67	1.02
Malaysia[3]	98	1
Myanmar	75	1.07
Philippines	79	1.09
Republic of Korea	99	1
Singapore[3]	99	1
East Asia & Pacific	87	1.06
Latin America & Carib.	92	0.98
South & West Asia	66	0.94
Sub-Saharan Africa	69	0.97

Source: UNESCO 2012

Table 2: Pupil/teacher ratio in primary education

Country or territory	School year ending in		
	1991	1999	2010
Cambodia	33	***53***	48
China	22	***22***	17
Indonesia	23	**22**	16
Japan	21	21	18
Lao PDR	27	31	29
Malaysia[3]	20	20	13
Myanmar	48	31	28
Philippines	33	35	31
Republic of Korea	36	32	21
Singapore	26	...	17
Thailand	22	21	...
Viet Nam	35	30	20
Weighted average			
World	26	26	24
East Asia & Pacific	23	24	18
Latin America & Carib.	27	26	22
South & West Asia	39	36	39
Sub-Saharan Africa	37	42	43
Low income countries	42	43	43
Middle income countries	27	27	24
High income countries	17	16	14

Source: UNESCO 2012

Table 3: mean years of schooling for population aged 17-22 by gender

	Cambodia 2000	Indonesia 2002	Laos 2000	Myanmar 2000	Philippines 1998	Thailand 2000	Vietnam 2002
Female	4.03	8.97	4.61	5.97	9.57	N/A	8.26
Male	5.50	8.88	6.28	6.06	8.88	N/A	8.33
Female/male	*0.73*	*1.01*	*0.73*	*0.98*	*1.08*	N/A	*0.99*
	Cambodia 2010	Indonesia 2007	Laos 2006	Myanmar 2010	Philippines 2008	Thailand 2005	Vietnam 2010
Female	6.83	3.28	5.20	N/A	9.98	12.17	9.08
Male	7.09	3.21	6.29	N/A	8.98	11.53	8.88
Female/male	*0.96*	*1.02*	*0.83*	N/A	*1.11*	*1.06*	*1.02*

Source: World Inequality Database on Education (http:www.education-inequalities.org)

Table 4: mean years of schooling for population aged 17-22 by rural/urban

	Cambodia in 2000	Indonesia in 2002	Laos in 2000	Myanmar in 2000	Philippines in 1998	Thailand in 2000	Vietnam in 2002
Rural	4.33	7.93	3.79	5.42	8.34	N/A	7.95
Urban	6.95	9.90	8.78	7.80	9.89	N/A	9.73
Rural/urban	*0.62*	*0.80*	*0.43*	*0.69*	*0.84*	N/A	*0.82*
	Cambodia in 2010	Indonesia in 2007	Laos in 2006	Myanmar in 2010	Philippines in 2008	Thailand in 2005	Vietnam in 2010
Rural	6.56	3.21	4.56	N/A	8.62	11.10	8.81
Urban	8.58	3.02	8.33	N/A	10.17	13.31	9.50
Rural/urban	*0.76*	*1.06*	*0.55*	N/A	*0.85*	*0.83*	*0.93*

Source: World Inequality Database on Education (http:www.education-inequalities.org)

Table 5: Relative mean years of schooling for population aged 17-22 by income quintile (base=quintile 1)

	Cambodia 2000	Indonesia 2002	Laos 2000	Myanmar 2000	Philippines 1998	Thailand 2000	Vietnam 2002
Poorest 20%	1.00	1.00	1.00	1.00	1.00	N/A	1.00
Poor	0.84	1.19	1.84	1.19	1.26	N/A	1.48
Middle	1.11	1.33	2.42	1.33	1.49	N/A	1.64
Rich	1.54	1.46	2.49	1.60	1.65	N/A	1.78
Richest 20%	2.26	1.65	2.43	1.90	1.71	N/A	1.98
	Cambodia 2010	Indonesia 2007	Laos 2006	Myanmar 2010	Philippines 2008	Thailand 2005	Vietnam 2010
Poorest 20%	1.00	1.00	1.00	N/A	1.00	1.00	1.00
Poor	1.21	1.18	1.55	N/A	1.34	1.22	1.12
Middle	1.42	1.35	2.18	N/A	1.51	1.27	1.22
Rich	1.66	1.50	2.82	N/A	1.65	1.37	1.26
Richest 20%	1.95	1.61	3.79	N/A	1.76	1.55	1.35

Source: World Inequality Database on Education (http:www.education-inequalities.org)

Table 6: Public spending on education

	Income group (as of 2010)	Public education spending (% of GNP)		Average real annual growth rate in public education spending (%)	Public education spending per capita (current US$)	
		1999	2010	1999-2010	1999	2010
Cambodia	Low income	1.0	2.7	38.22	3	20
Indonesia	Lower middle income	2.8	3.1	3.09	16	78
Laos	Low income	1.0	3.3	10.05	3	33
Malaysia	Upper middle income	6.1	5.9	7.03	204	477
Philippines	Lower middle income	3.3	2.7	0.82	34	56
Thailand	Upper middle income (?)	5.1	3.9	3.04	99	162
Singapore	High income	3.0	3.3	9.68	738	1301
Vietnam	Lower middle income	3.5	5.5	N/A	N/A	64
Low income countries		3.1	4.6	7.2	15	22
Lower middle income countries		4.3	4.8	3.1	83	105
Upper middle income countries		4.6	4.7	5.3	250	332
High income countries		5.0	5.4	2.3	1489	1792
World		4.5	4.9	2.7	528	644

Source: Expenditure data from UNESCO (2012); GDP deflator from World Bank

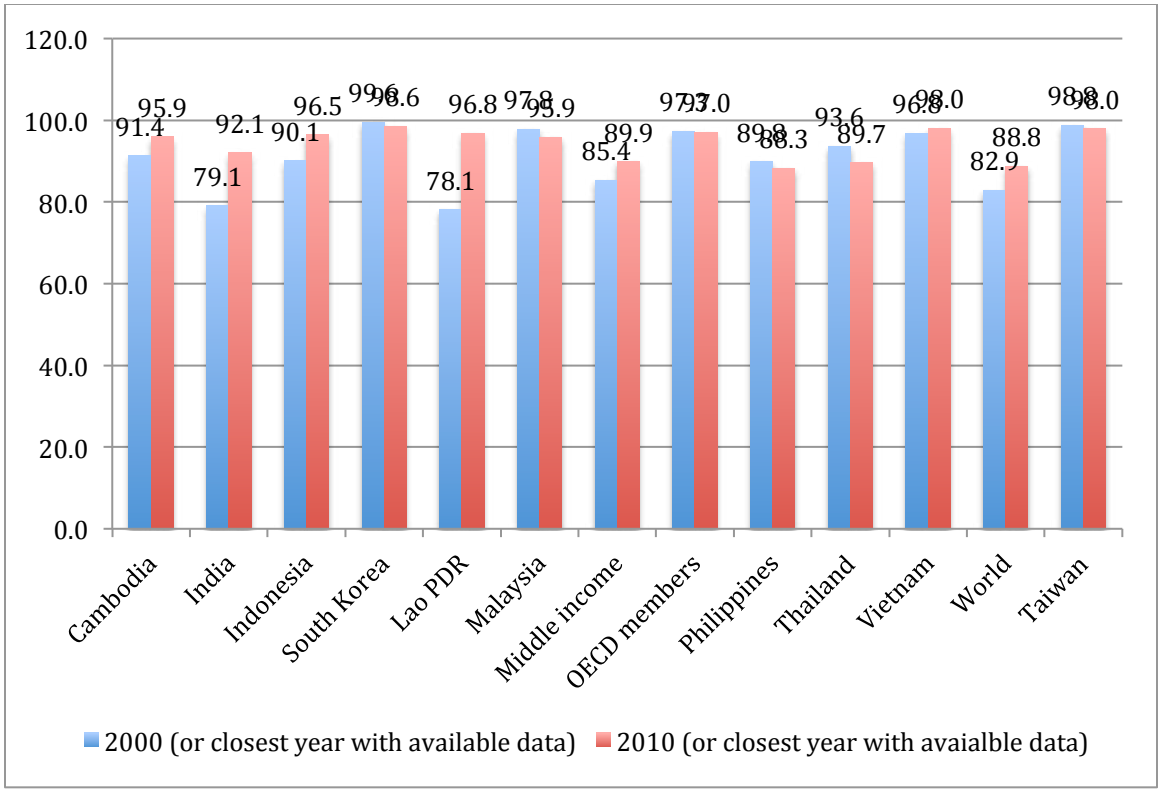

Figure 1: Primary School Net Enrollment Rate (%)

Source: Taiwan data are from 2012 Taiwan Education Statistical Indicators; all other countries' data are from World Bank.

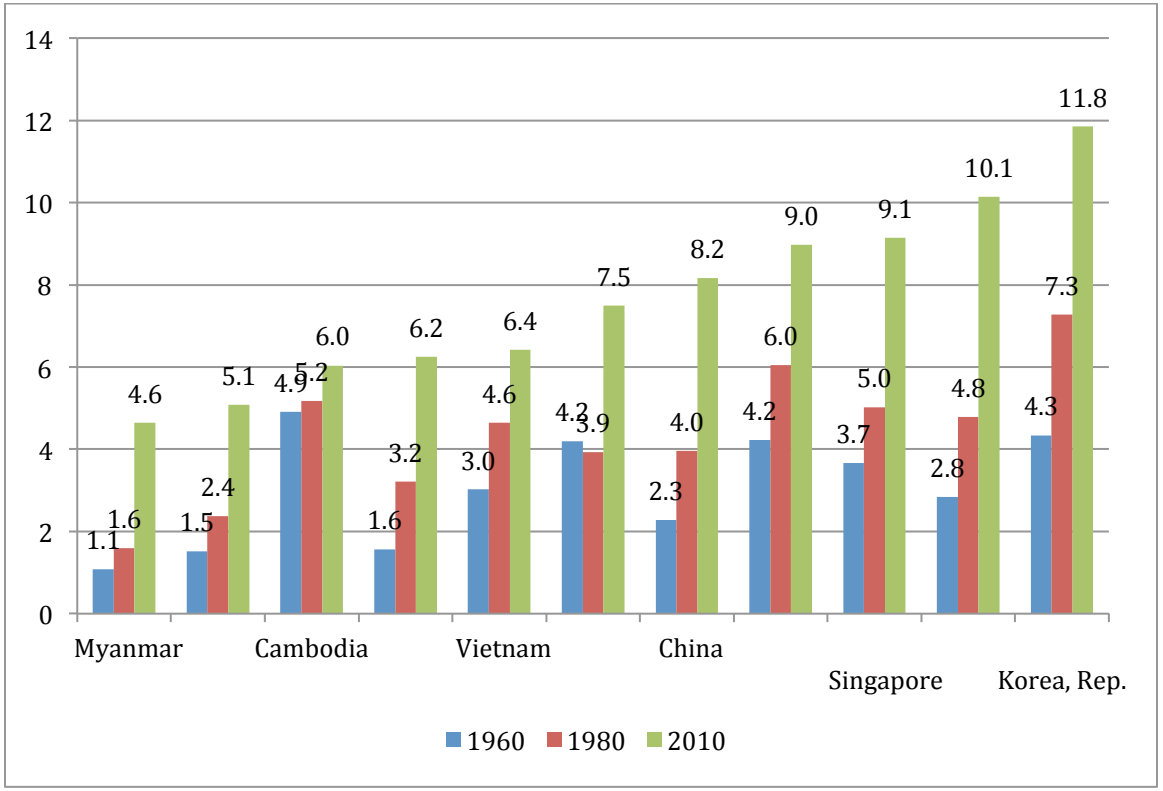

Figure 2a: Mean years of schooling for population age 15+

Source: Data are from Barro-Lee Educational Attainment Dataset. Note: USA = 8.4 (1950) and 13.1 (2010).

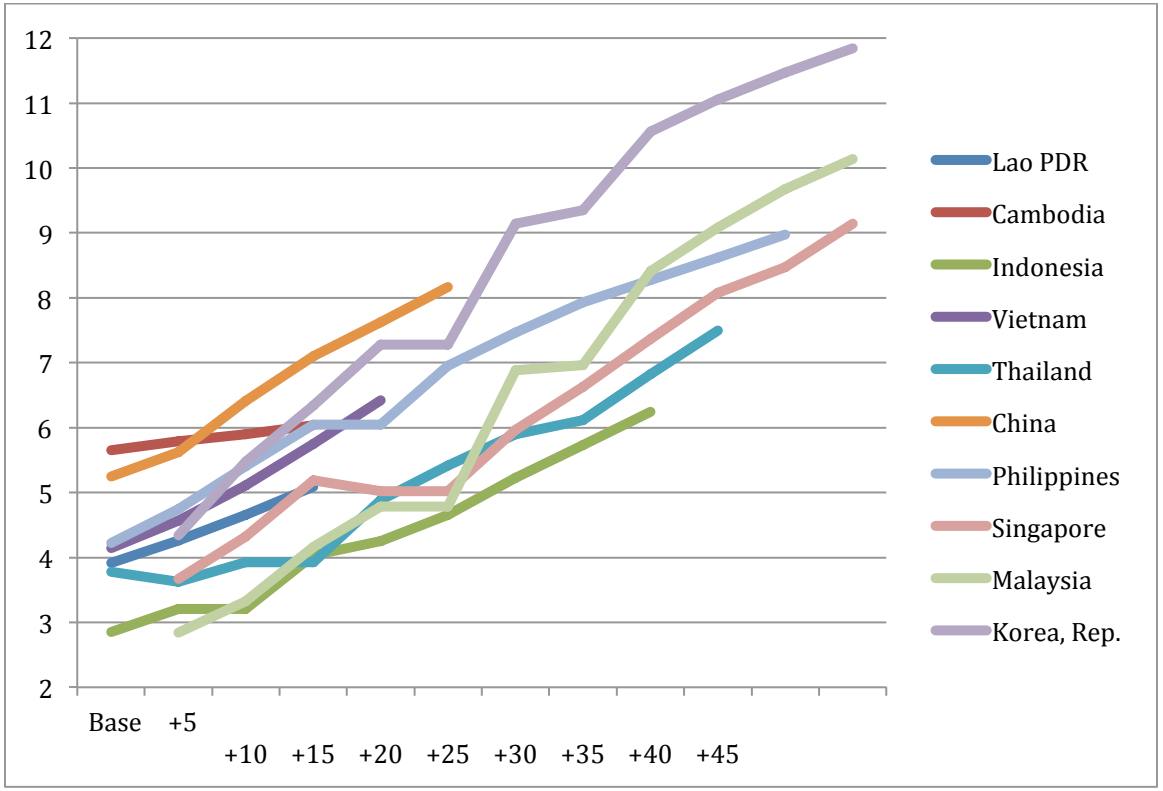

Figure 2b: Mean years of schooling for population aged 15+ for comparable stage of development (based on GNI per capita)

Source: Data are from Barro-Lee Educational Attainment Dataset. Base year for Vietnam was 1990, Lao PDR 1995, Cambodia 1995, Indonesia 1970, Thailand 1965, China 1985, Philippines 1960, Singapore 1955, Malaysia 1955, South Korea 1955.

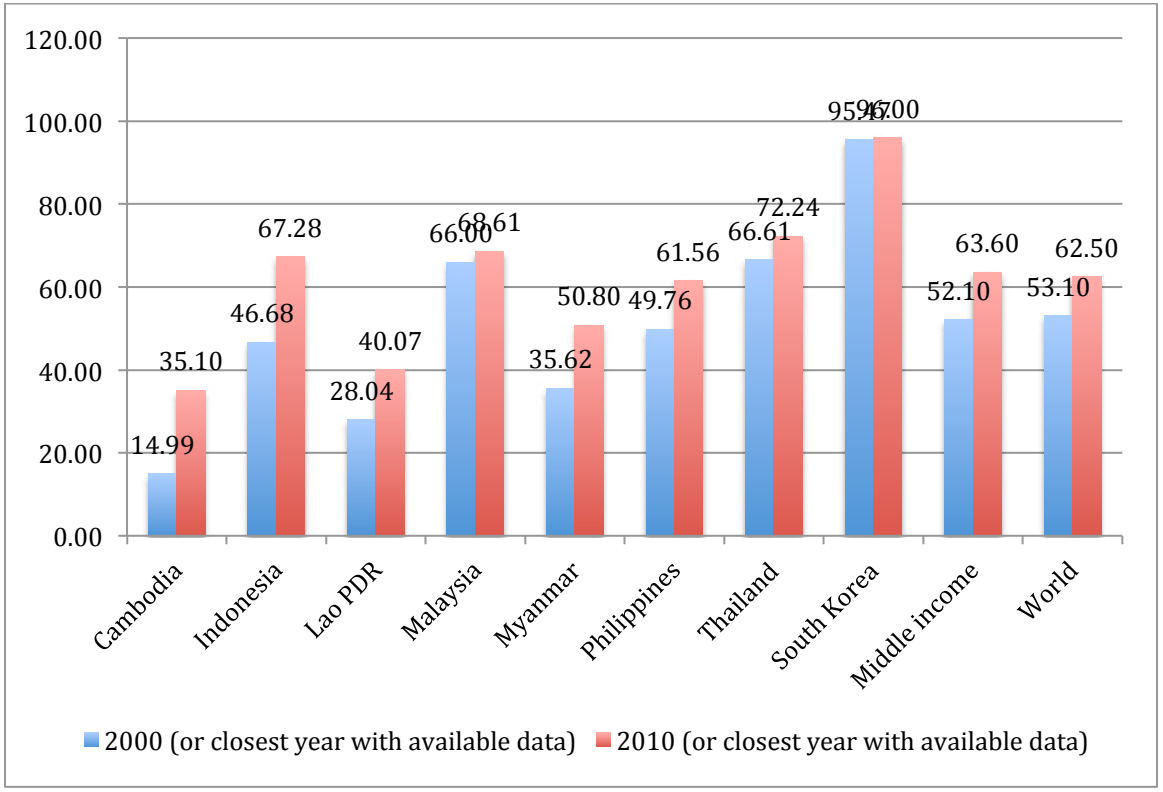

Figure 4: Secondary School Net Enrollment Rate (%)

Source: Taiwan data are from 2012 Taiwan Education Statistical Indicators; all other countries' data are from World Bank data base.

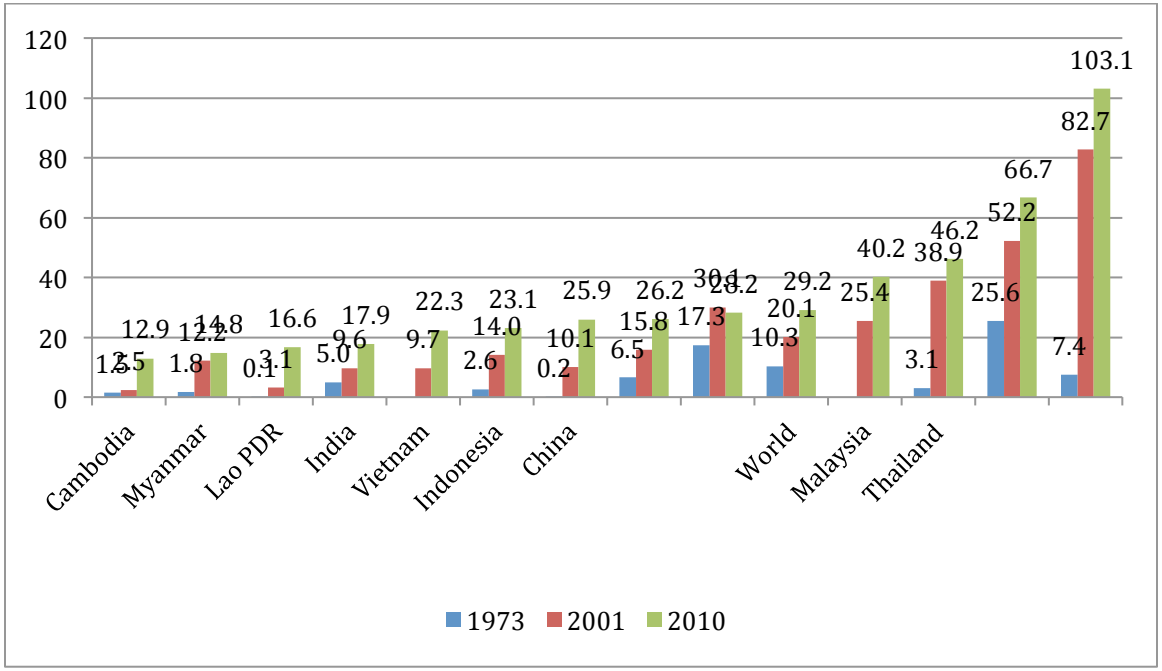

Figure 4: Tertiary Gross Enrollment Rate (%)

Source: Taiwan data are from 2012 Taiwan Education Statistical Indicators; all other countries' data are from World Bank data base.

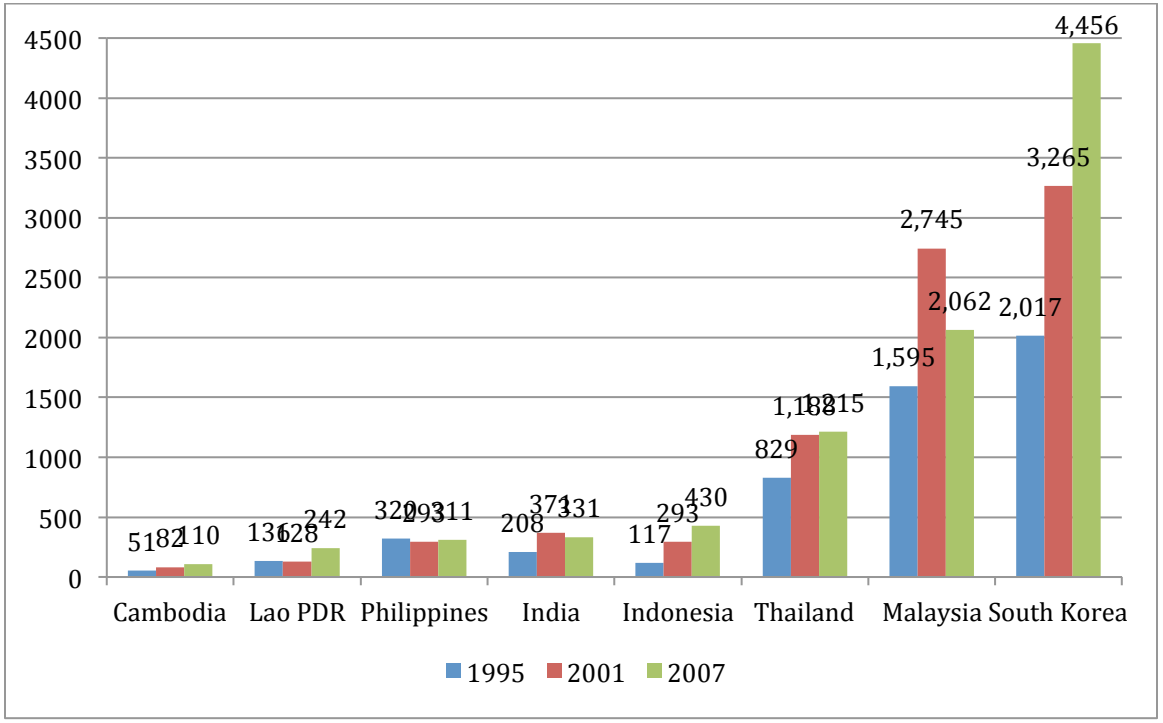

Figure 5: Total public education expenditure per pupil (2005 international dollar)

Source: World Bank

Note: For 1995 data series: Philippines and Laos data are for year 1996, India 1997, Cambodia 1998. For 2001 data series: India data are for the year 2001. For 2007 data series, India data are for the year 2006.

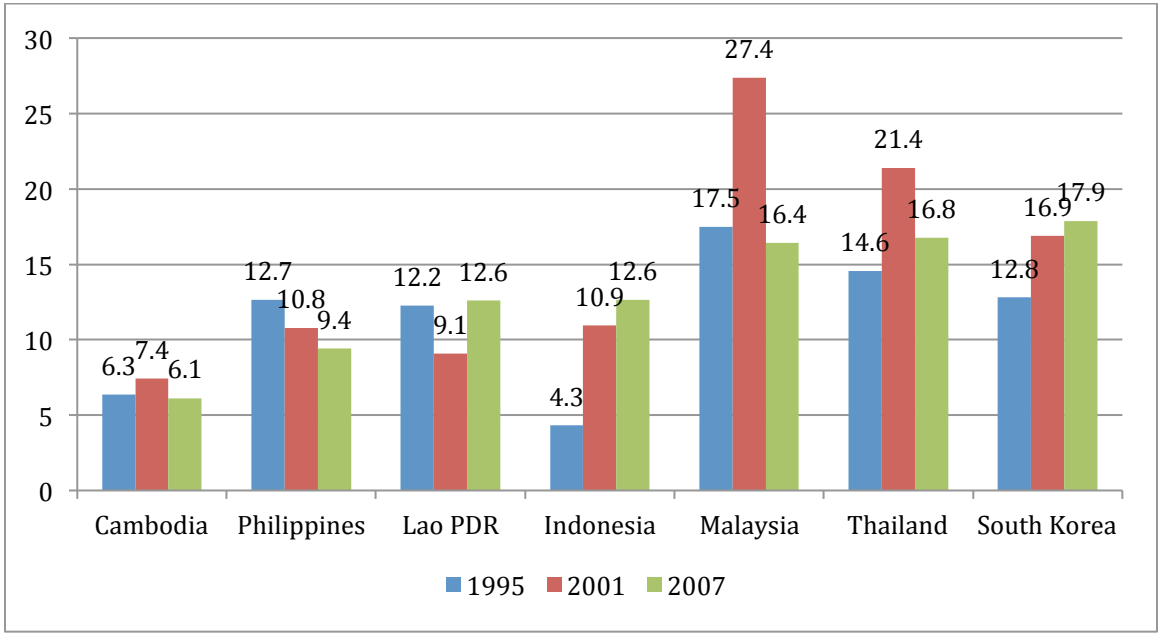

Figure 6: Public education expenditure per pupil as percentage of GDP per capita

Source: World Bank