GDP growth per worker slowed in most countries in East Asia after the 1997-98 Asian financial crisis. In some countries (China, Indonesia and the Philippines) improvements in productivity helped output per worker to recover relatively well in the decade after crisis. In others (such as in Malaysia and Thailand) productivity improvements after the crisis have not made up for losses in factor accumulation. Still, capital accumulation remains the dominant force boosting per-capita growth in the region. With the growth of capital accumulation naturally slowing down and the demographic dividend wearing thin, productivity growth is becoming more important in sustaining long-run economic growth. And the current environment of weak external demand, declining labor force, and intensified competition from other regions further highlight the importance of boosting productivity to maintain high levels of growth.

Background

The debate on sources of the phenomenal economic growth in the East Asian countries over the last four decades has induced a huge volume of research since the early 1990s when the success of these countries became an aspiration of other developing countries across the globe. It was of paramount importance both for academia and policy makers to understand how these economies had achieved such an unparalleled growth that led to rapid increases in the living standards of their population and poverty reduction. The literature divided into two streams: ‘accumulation view’, saying that factor accumulation was main source of growth, versus ‘assimilation view’ stating that productivity gains, or the total factor productivity (TFP) was the primary source of economic growth in these countries.

Early studies tended to agree that high growth rates in the East Asian countries resulted largely from gains in productivity which was derived from the acquisition and mastery of foreign technologies. For instance, Pack and Page (1994) argued that high growth rates in these countries were driven by ‘rapid growth of TFP derived mainly from the movement toward international best practices’ that was partly a result of the superior manufactured export performance. The World Bank’s own East Asian Miracle: Economic Growth and Public Policy (1993), has specifically attributed the East Asian high growth to improvements in efficiency that was closely associated with policy reform, openness to trade and technological innovation.

This traditional assimilation view was challenged by the empirical research arguing that East Asian growth was mainly input-driven. This research initiated by Young (1992, 1994, and 1995) and Kim and Lau (1994) focused on the newly industrialized economies (NIEs)—Singapore, Hong Kong, Taiwan and Korea. Using the neoclassical growth accounting framework that decomposes growth in output into contributions from the accumulation of inputs and a residual attributed to TFP change, they concluded that the high growth rates in NIEs were mostly a result of faster factor accumulation. Moreover, they concluded that TFP growth was not even high enough by international standards. Based on these studies, Krugman

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1 TFP measures a combination of changes in efficiency in the use of factor inputs and changes in technology.
(1995) argued that the East Asian success was no miracle—a result of perspiration rather than inspiration; the high growth rates would not therefore be sustainable in the future.

Since then, empirical research has been inconclusive, despite the expanded coverage of countries and improvements in methodology.\(^2\) Table 1 compiles these results. Collins and Bosworth (1996 and 2003) made a comprehensive attempt to compare growth performance of NIEs with that of other developing and advanced countries over the period of 1960 and 1994, using a database covering 88 countries. Similar to Krugman and others, they found that TFP growth played a surprisingly small role in East Asia’s success (Table 2). But they also found that East Asia was evolving toward a greater emphasis on TFP gains and thus could sustain future growth. On the contrary, using almost the same set of country data, Klenow and Rodriguez-Claré (1997) estimated very high TFP growth rates for the East Asian countries. Iwata et. al (2003) moved to a new technique that does not require restrictive assumptions in the conventional growth accounting approach such as competitive factor markets and found that the TFP growth over the period 1960 – 1995 has been an important factor in the overall growth performance in the East Asian countries. It is worth noting that most researchers agree the TFP growth has been a major contributor to high growth in China since mid-1960s, unlike the NIEs and other developing East countries.

There has been a renewed attention to drivers of economic growth in East Asia. In the wake of the 1997 crisis, academics and policymakers turned their focus from the determinants of growth to the importance of sustaining economic growth over the longer period and to the structural foundations for reducing vulnerability to crises. A wide-ranging structural reform agenda emerged from this debate, focusing on financial and corporate sector reform and the need to strengthen the institutional and regulatory underpinnings of the market economy. However, as the East Asian countries have successfully recovered from the more recent global crisis, the drivers of past economic growth have received a renewed attention.

The role of TFP as the source of economic growth in Asia had been increasing over time. Recent studies show that high growth rates of the East Asian countries have been primarily driven by factor accumulation, but the productivity gains have begun to play a larger role in growth since early 2000s (Collins and Bosworth, 1997, followed by Park and Park, 2010, and Lee and Hong, 2010). More specifically, prior to 2002 capital accumulation was the dominant source of growth whereas TFP growth emerged as an important source of growth since 2002 for NIEs, China, and other developing countries in Asia (Figure 1). This pattern is consistent with the region’s transition from a low-income, capital-deficient region to an increasingly middle-income region. Lee and Hong (2010) reach the same conclusion.

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**Figure 1.** Apart from China, TFP played a surprisingly small role in Asian growth, although its contribution is increasing of late

**Figure 2.** In Indonesia, China, and Thailand, labor force is expected to decline before 2050

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\(^2\) Felipe (1999) questioned the validity of the growth accounting method as means to analyzing the sources of growth. The issues are as follows: (i) TFP is measured as a residual, (ii) the growth decomposition is sensitive to underlying assumptions about the nature of production process (perfect competition) and to indicators to measure changes in output and inputs (constant returns to scale), and (iii) an accounting decomposition cannot determine the fundamental causes of growth. See also Collins and Bosworth (2003).
With the growth of capital accumulation naturally slowing down and the demographic dividend wearing thin, productivity growth is becoming more important in sustaining long-run economic growth. Economy-wide productivity improvements come from two main sources: technology and capital accumulation that improve productivity within sectors, and the movement of labor from less productive to more productive sectors. As the economic transformation from agriculture-based to more industrialized economies proceeds, countries loose the demographic dividend they have been enjoying so far (Figure 2).\(^3\) Within-industry productivity differentials in EAP are quite large (in some industries, total factor productivity of the top firms is 20 times higher than that of the least productive firms, see Vostroknutova, 2011). More efficient use of capital will therefore be important, as will be further scaling up efforts in technological innovation and adoption. But factor accumulation will continue to be a key part of sustaining high economic growth as well. Eventhough most economies in the region have increased capital efficiency after the Asian crisis, domestic investment rates have not recovered in the middle-income countries (except China, see also World Bank, 2010).

Sources of growth in EAP: stocktaking and projections

We extend previous analysis of the sources of growth to the middle-income countries (MICs) in East Asia and Pacific. In the aftermath of the most recent financial and economic crisis, the question of the sources of growth has come to the forefront of the policy agenda, as governments are trying to design or adjust their development strategies in an uncertain external environment. We use the methodology in Collins and Bosworth (2003) and extend their analysis to 2010.\(^4\) We also make simple projections for the future.\(^5\)

A growing labor force and human capital improvements together have been significant contributors to economic growth in all countries between 1970 and 2010. Half of the growth could be attributed to labor force and human capital improvements in 1975-1990 in the Philippines, Indonesia, and China, while between a half and a third—in Malaysia and Thailand (Figure 3). However, between 2001 and 2009 their contribution has been on a declining trend, reaching a third of growth in the Philippines, Indonesia, and Thailand, and one-tenth in China.

Due to the effects from the Asian crisis, the contribution to growth from capital accumulation was much lower in 2001-2009 than before, except in China. In Thailand, the decline in capital accumulation was the most prominent, followed by Malaysia and the Philippines. In China, the contribution from capital accumulation grew to more than half of growth by 2001-2009.

TFP contribution will need to increase in all countries under consideration, if they are to grow at pre-Asian crisis rates. While not very high in early years, total factor productivity improvements have strongly contributed to growth in the years after the Asian crisis. When capital accumulation fell after the crisis, countries that were able to increase total factor productivity grew faster. If MICs were targeting past growth rates and accumulate capital at the average historical speed, they would need to facilitate even faster improvements in TFP (Figure 3). These improvements would need to make up for the loss of demographic benefits.

Korean experience supports this view. Korea’s rapid growth during the past four decades had been primarily driven by capital accumulation, with TFT playing a rather modest role compared to other countries (Figure 4). As the country went through the Asian crisis in 1997 and its population aged fast, the contribution from capital accumulation and labor force fell sharply, making a lower growth path inevitable. At the same time, TFP growth has accounted for an increasing share of growth, but a vast literature on the subject has argued it would need to be further accelerated to make growth more sustainable in the long-run.

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\(^3\) See also Bloom and Finlay (2009) see also East Asia and Pacific Economic Update (April 2011).

\(^4\) All calculations use WDI data on output, UN data on labor force, WDI data on years of schooling, and Collins-Bosworth data on capital which is based on Nehru and Dhareshwar (1993). For Thailand, Government data on net capital stock in 1988 prices is used. Human capital improvements are included as a factor of production, and the return to years of schooling is assumed to be 7 percent in all countries.

\(^5\) For all countries, projections use assumptions of growth rates for output, capital, and human capital are assumed to be equal to their averages between 1960-2000. In China, we make more complex assumptions, to account for the Government’s plan to reduce growth of the capital stock, as in He and Kuijs (2007) and Kuijs (2009).
Improvements required to support growth slightly differ by country. For Indonesia and Thailand, to grow on average at 7 percent (their average pre-Asian crisis rate) they would need to bring capital accumulation to the pre-crisis levels, as well as double TFP contributions. For Malaysia, not only an increase in capital accumulation would be required, but also more than tripling TFP contribution to growth. For the Philippines, if it were to grow at around 5 percent (average pre-crisis speed), keeping TFP contribution at par with that during 2001-2009 and increasing capital accumulation to pre-crisis levels would be sufficient; but an increase in growth rate beyond 5 percent would require TFP improvements. In China, we projected a gradual slow-down in capital accumulation, following its medium-term plan aimed at rebalancing the economy (He and Kuijs, 2007, and Kuijs 2009). As a result, if TFP growth remains at its current levels, the loss of the demographic benefit would mean a decline in overall growth.
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References

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