



SESSION 1

Stylized Facts on Productivity Growth

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Executive Summary

Before the 2008/09 global financial crisis (GFC) struck, a benign external environment, more integrated world economy, and supportive domestic policies combined to accelerate per-capita income growth across much of the world. Since then, however, growth has decelerated across the board—the rate falling sharper in high-income economies than emerging markets. This is consistent with the trajectory of productivity growth. Indeed, more than 90% of the differences in per-capita income around the world can be explained by differences in labor productivity.

Greater efficiency in emerging economies has boosted global productivity. But the trend began to reverse in mid-2000s for total factor productivity (TFP), and during the GFC for labor productivity (**Figure 1**). The deceleration of TFP growth in emerging and developing economies has been particularly sharp, falling below the global average in 2013.

What about Asia? The 1997/98 Asian financial crisis (AFC) led to a sharp fall in per-capita GDP growth. But since the early 2000s, compounded annual growth rates accelerated (**Figure 2**). This boosted the region's capacity to reduce poverty and raise living standards, although at the same time the resulting relative income inequality worsened. Growing trade and foreign direct investment (FDI), both externally and regionally, significantly contributes to accelerating growth, a standard phenomenon of convergence (Lucas, 2007). A robust production network, driven by strong economic growth in the People's Republic of China [PRC], among others, not only boosted trade and investment in individual economies, but also raised international trade volumes. Thus, the period of strong productivity growth coincided with growing regional integration. When the GFC hit, growth began decelerating—although Asia's rate remains higher than in the rest of the world. But when Asia's three largest economies are excluded (the PRC, Japan, and India), per-capita GDP growth fell below the rate prior to the AFC. It is also much lower than the rate for Asia as a whole. The PRC's spectacular growth and strong expansion in India had a lot to do with this trend.

What happened in Asia is consistent with the productivity growth cycle: falling during and immediately after the AFC; recovery beginning in the early 2000s; and tumbling again—particularly sharply for TFP—in 2007/08 (**Figure 3**). Since 2002/03—and with a surge in capital used for greater factor proportions

(**Figure 4**)—TFP growth accelerated, almost double the rate immediately before the AFC. This, however, is mostly a PRC (and to some extent India) story, where rapid capital accumulation accompanied reforms and reduced distortions in product and factor markets, higher spending on research and development (R&D), rising numbers of patents, and further economic opening to foreign capital and international trade. When the PRC, Japan and India are excluded, the productivity recovery was less dramatic. In the case of labor productivity, the growth rate never recovered from the AFC shock. Meanwhile, as mentioned, income inequality worsened (**Figure 5**).

The post-GFC productivity trend mimics what occurred in emerging and developing economies. Demand factors reduced labor productivity and TFP growth—as in all crisis episodes. But persistently low spending on infrastructure and languishing reforms (supply side) in some economies made this deceleration unusually sharp. Asia clearly faces the challenge of how to arrest and reverse this decelerating productivity trend and reduce inequality.

To the extent productivity changes occur in just a few sectors or spread economy-wide, it is useful to distinguish the two in trying to understand Asia’s productivity cycle. Variations in labor productivity can be decomposed into (i) a “within” component, where productivity changes in selected sectors without any changes in sectoral composition; and (ii) a “structural” component, where the sectoral composition changes without altering sectoral productivity. When the first component dominates and aggregate productivity growth decelerates, improvements in selected sectors fail to diffuse to the rest of the economy; productivity improvements remain isolated in those sectors. On the other hand, when reforms lead to a marked shift in sectoral share with no changes in each sector’s productivity, the structural component dominates.

Obviously, distinguishing the two can help policy guidance. For example, resource allocation and structural reforms following trade liberalization may boost aggregate productivity (a positive contribution from the “structural” component). But when adversely affected industries grow in number, and unproductive industries continue to exist due to the difficulty to “exit,” the “within” component has a negative effect on productivity. Ha & Kiyota (2014) show this applied to post-2007 Viet Nam. In this case, enhancing productivity at the sector or firm level is needed. It may include better infrastructure, a competition policy that allows more efficient firms to emerge, greater use of capital by workers (modern machines and equipment), improvements in labor quality through vocational training, and adopting new technology through FDI and capital goods imports—although it may worsen wage inequality as the supply of skilled labor cannot meet demand. Most economies at an early stage of development will likely face these supply constraints. Landlocked developing countries (LLDCs) and fragile and conflict-affected states (FCAS) also fall into this category—they may need to focus on these fundamentals before anything else. More generally, improving “within” productivity is a good starting point. It is like a necessary condition for enhancing economy-wide productivity. Spreading improvements to the rest of the economy should follow, and it requires more “structural” change.

Classifying observations into three phases—boom-and-bust, pre-GFC, and post-GFC— shows that Asia did relatively well in phase-2 (**Figure 6**), although growth decelerated when PRC, Japan, and India are excluded (**Figure 7**). This was supported by a more productive use of capital, where the increase in factor proportions occurred along with accelerated TFP growth. The “within” and “structural” components jointly contributed to productivity improvements, and the “structural” component share was relatively high—39% for Asia and 46% for Asia minus the PRC, Japan and India during 1999–2011. Strong FDI inflows and trade along with growing regional integration during the period enabled many economies to adopt better technology, enhance human resources, and create new or expand existing industries (McGrattan & Prescott, 2007; McGrattan, 2012). External conditions—including low global interest rates—further helped these favorable conditions. Cooperation among economies in Asia also intensified during the period (ADB’s Asian Economic Integration Monitor, various issues). When a trend reversal occurred in phase-3, the deceleration of productivity growth was accompanied by a percentage point drop in the “structural” component. Thus, focusing on structural change becomes critical.

Indeed, the impact of structural change on productivity cannot be overstated. But the kind of structural change must be growth-enhancing. The relationship between each sector's size, growth, and productivity changes matters. Economy-wide productivity is expected to improve if fast-growing sectors—measured by changes in employment share—are where productivity growth is most rapid. Even if particular sectors' productivity improve, aggregate productivity may not increase if the share of those sectors in the national economy is stagnant or declining. Size also matters. If those sectors are relatively small, the resulting aggregate productivity depends on the productivity trend of other sectors. If they are large, there is still a chance aggregate productivity will improve—especially if those positive ingredients in a sector's productivity enhancement are effectively diffused to the rest of the economy. A similar conjecture applies to geographic entities like special economic zones (SEZs). Unless the positive effects from various SEZ incentives can be diffused to the rest of the economy—especially to a large number of small and medium enterprises (SMEs)—the likely improvements in productivity will remain confined to the SEZ.

On this basis, fast-growing sectors in several Asian economies were not those with rapidly improving productivity. For example, as the shift from manufacturing to services occurred, aggregate productivity growth declined, because most fast-expanding services were low-end with slow productivity growth (retail trade, construction, and other informal activities). This may also contribute to growing income disparity. In other cases, services with rapid productivity growth (telecommunication and transport, for example) did not expand fast enough for their share in the national economy to grow. There are wide variations of these two among economies in Asia. Taking the region as a whole, productivity growth in agriculture and transport generally improved, but the sectors' share in the national economy fell. On the other hand, the share of most other sectors with lower productivity growth increased (**Figure 8**). Excluding PRC, Japan, and India, the productivity growth in social services, construction, and finance had been slow, yet expanded faster than transport and manufacturing (**Figure 9**). All these contributed to decelerating aggregate productivity growth. Once again it underscores the critical role policy reform plays in ensuring growth-enhancing structural change.

Finance also matters. Experience shows that the easier it is to raise funds—for example through equity or debt markets—the easier it is to boost productivity, by allowing producers in traditional sectors to modernize and better reallocate capital. While financial markets in many Asian economies have been liberalized—albeit to different degrees—and have steadily developed given favorable domestic policies and regional cooperation (through, for example, the ASEAN+3 Asian Bond Markets Initiative; see ADB, 2014), financial friction remains in several economies. A recent study shows these frictions can cause inefficient dispersion in firms' marginal product of capital and in turn leads to misallocation. More importantly, they can distort entry and decisions to adopt technology (Midrigan & Xu, 2014). Yet, technological change—critical for productivity enhancement—derives mostly from intentional actions taken by firms and agents in response to incentives, and is hence endogenous (Romer, 1990). Productivity losses from the latter are significant because entry and technology adoption entails large, long-term investments with only gradual returns—thus financing them internally is difficult.

Manufacturing remains important in identifying activities likely to improve productivity (Rodrik, 2013). Based on country data globally, aggregate productivity showed little convergence. Low productivity economies failed to close the gap with high productive economies—there is no systematic tendency for economies that start with lower productivity to grow more rapidly (**Figure 10**). This is also evident when tested for each sector, with one exception. Manufacturing, whether based on aggregate or sub-sector data, shows a strong tendency for unconditional convergence (**Figures 11, 12**). The slope steepens when country fixed effects are included. The finding—based on a large data set covering many economies with varied policies and conditions—points to the unmistakable strategic role manufacturing plays as a source for improving productivity. Policies that lead to a stagnant or declining share of manufacturing (as happened in several Asian economies; **Figure 13**) should therefore be reviewed.

Another study using data from the Organisation for Economic Co-operation and Development (OECD) found that services sector is an important source of productivity improvement (Bernard & Jones, 1996). This should not be surprising as the bulk of services in most industrial economies are

often highly productive and information-technology (IT)-intensive, unlike the less productive and informal services in most developing economies. Obviously, the productivity performance of each activity varies. Some are low-end; some high-end. So whether focusing on manufacturing or services, what matters is to generate high-end, high-productive activities. Market forces alone may not be sufficient for this purpose; it may also require industrial policies of the right kind unlike those adopted in the 50s and 60s (Stiglitz, Lin, Monga, and Patel, 2013). Indeed, after suffering from benign neglect, industrial policy has become almost fashionable again in the policy making circles. But converting the principles of industrial policy into practical frameworks for concrete action is always a challenge.

This narrative captures the broad picture of what happened in Asia. Yet, Asia is extremely diverse. Even excluding the PRC, Japan, and India, differences abound. Problems and challenges in middle income economies may not be the same as those faced by high income economies. And they may be very different from those faced by FCAS and LLDCs. Given the current world economy, attempts to reverse the decelerating trend in productivity growth and rising income inequality may also face a less benign external environment, not to mention the geopolitical risks that can jeopardize national and regional policies that help enhance productivity.

Socio-economic, technological, and institutional conditions will likely change as well, implying that the current regional cooperation and integration (RCI) approach should be reassessed. This includes “new” RCI issues and policies covering: transportation (for example, the role played by maritime infrastructure in multimodal transport), energy (the dramatic impact of shale gas), trade (greater emphasis on behind-the-border policy reform), and finance (overreliance on banks against the more stringent capital requirements under Basel III, and emerging regional financial arrangements for infrastructure, SMEs, disaster risk, and safety nets). Adopting cross-sectoral and regional approaches to deal with each of these—taking account the unstoppable trend toward urbanization—may emerge as pressing future challenges. With growing interest among member economies and the stepped-up efforts of Asian policymakers to enhance cooperation and integration between subregions (between South Asia and Southeast Asia for example), new RCI opportunities and challenges for enhancing productivity and reducing inequality emerge. These must also be addressed.

Productivity is a complex and multidimensional concept. Understanding its sources, causes, and implications for Asia—how RCI could play a role—and exploring alternative approaches to reverse decelerating productivity growth and worsening income inequality is what this Roundtable is all about. For many economies, this issue is high on their policy agendas, and we at the ADB are ready to respond and help.

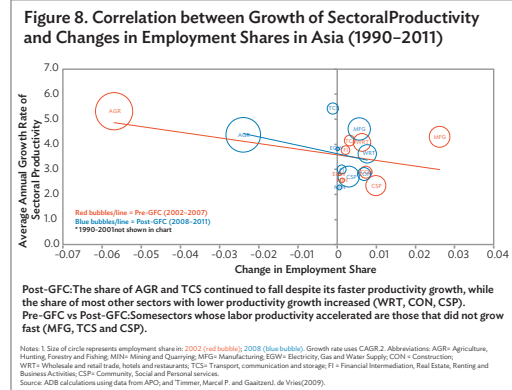
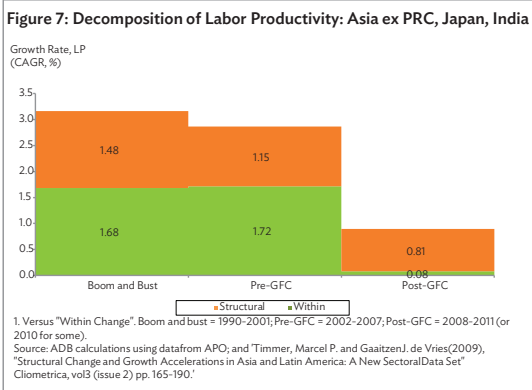
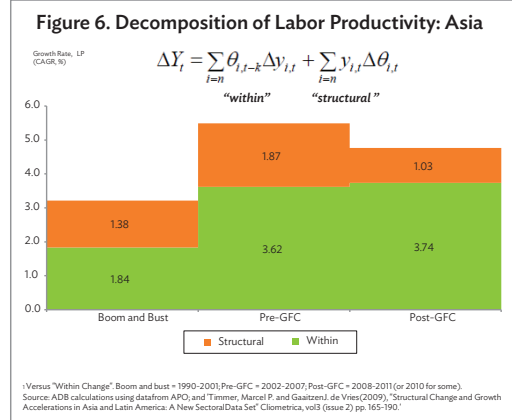
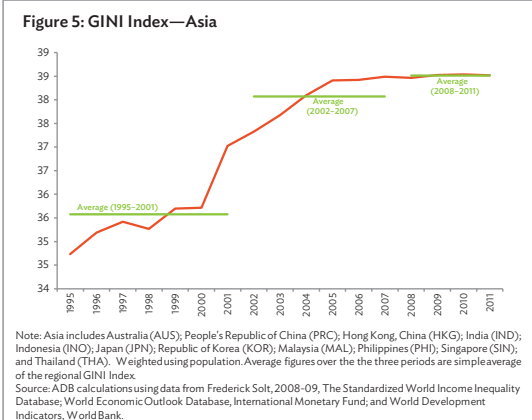
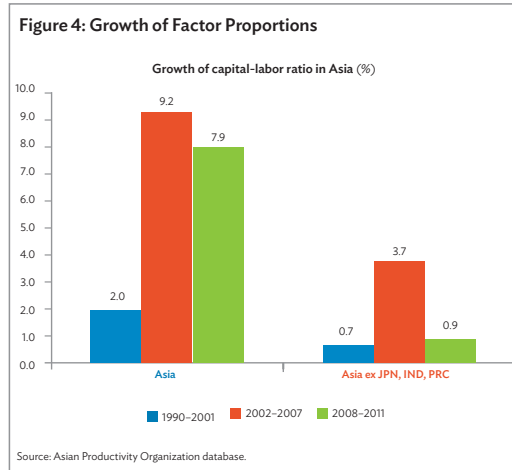
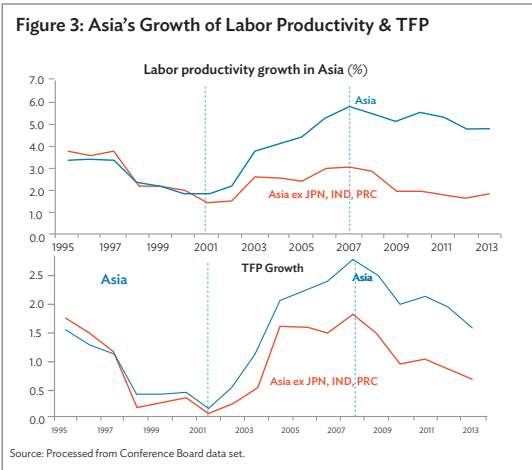
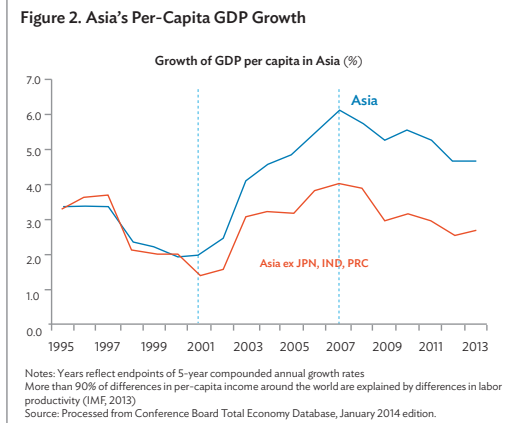
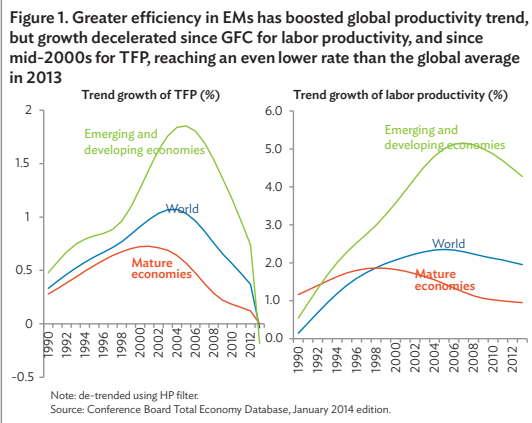
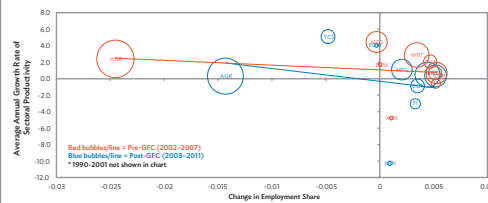


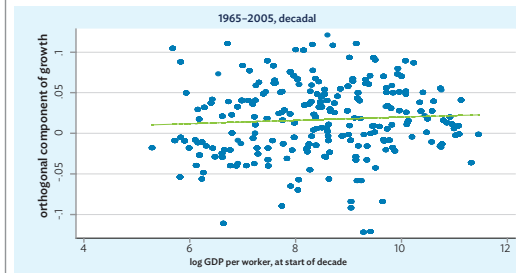
Figure 9. Correlation between Growth of Sectoral Productivity and Changes in Employment Shares in Asia ex PRC, India and Japan (1990–2011)



Post-GFC: Slow productivity growth sectors (CON, FI) grew faster compared to fast productivity growth sectors (TCS, EGV). Pre-GFC vs Post-GFC: Sectors whose labor productivity decelerated are those that grew faster (MFG and WRT); while those whose labor productivity accelerated grew slower (TCS, EGV).

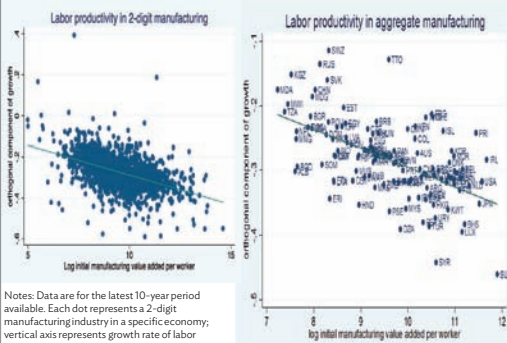
Notes: 1. Size of circle represents employment share in 2007 (red bubbles), 2008 (blue bubbles). Growth rate uses CAGR.2. Abbreviations: AGR= Agriculture, Hunting, Forestry and Fishing; MFG= Mining and Quarrying; MFGW= Manufacturing; EGVW= Electricity, Gas and Water Supply; CON= Construction; WRT= Wholesale and retail trade, hotels and restaurants; TCS= Transport, communication and storage; FI= Financial Intermediation, Real Estate, Renting and Business Activities; CSP= Community, Social and Personal services. Source: ADB calculations using data from APO, and Timmer, Marcel P. and Gaiztanzi, de Vries(2009).

Figure 10: No Convergence of Economy-Wide Productivity: Absence of Productivity Catch-Up



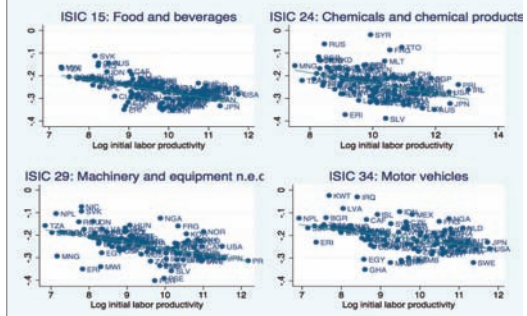
Notes: Each dot stands for a particular economy in a specific decade. Variable on the vertical axis is growth of GDP per worker over four separate decades (1965-1975, 1975-1985, 1985-1995, 1995-2005), controlling for decadal fixed effects. Source: Roubini (2013), using data from Maddison(2010) and PWT T.D. (2011).

Figure 11. Unconditional Convergence in Manufacturing Sector



Notes: Data are for the latest 10-year period available. Each dot represents a 2-digit manufacturing industry in a specific economy; vertical axis represents growth rate of labor productivity (controlling for period, industry, and period industry fixed effects).

Figure 12. Unconditional Convergence in Manufacturing Sub-Sector



Notes: Vertical axis represents growth in labor productivity over subsequent decade (controlling for period fixed effects). Data are for the latest 10-year period available.