

III. ESCAPING THE MIDDLE-INCOME TRAP

The global economic crisis brought into sharper focus the need for East Asia's middle-income countries to accelerate structural reforms needed to transition through the crowded middle of industrial development and emerge as high-income economies. This will not be easy. For decades, many economies in Latin America and the Middle East have been stuck in this middle-income trap, where countries are struggling to remain competitive as high-volume, low-cost producers in the face of rising wage costs, but are yet unable to move up the value chain and break into fast-growing markets for knowledge and innovation-based products and services (Figure 47).

For the middle-income countries of East Asia, some key ingredients for a strategy of faster convergence to the advanced economies are in place. They are in the most vibrant region of the world that includes China and India, where macroeconomic stability and prudent fiscal, monetary, and regulatory policies are well entrenched; global and regional integration is proceeding apace; and urbanization is rising rapidly.

Much more is needed for transition to high-income status. Rapid and sustainable growth requires high levels of investment which embody new technologies. These investments will be in physical and human capital, including in roads, information technology, and other infrastructure. The business environment needs to enable entrepreneurs to create and develop businesses, and then exit from them—should they fail—without suffering a stigma that tends to discourage risk taking and economic growth. An enabling environment for creative destruction, as the process of entry of new and improved firms and exit of less efficient ones is called, also includes conditions for innovation supported by an education system that shifts from equipping workers with basic skills to providing them with abilities to create new products. Improved logistics and connectivity are vital for rapid growth to be sustained, as is the transformation of urban centers from mega-cities into incubators for new ideas; and so is access to adequate financing for innovative entrepreneurs.

These reforms are crucial for the region's future. Indices of global competitiveness show stagnation for all of the region's middle-income countries other than China (Figure 48). The lack of an innovation-conducive policy framework, weak technological readiness, persistent skill mismatches, and an inadequate quality of infrastructure were among the most important constraints to improving competitiveness. The rest of the section addresses some of these challenges.

Figure 47. Some countries get stuck in middle income, others escape

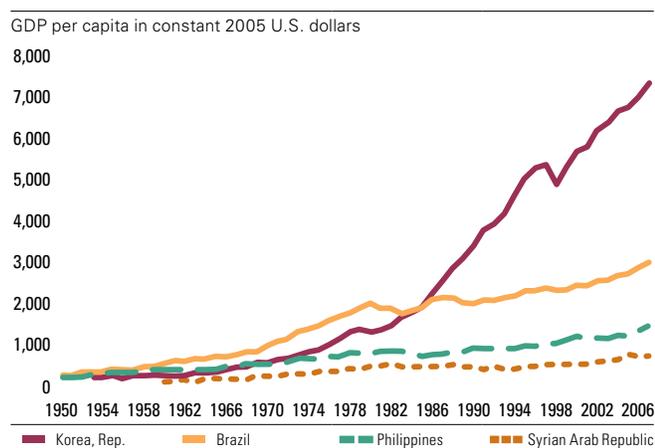
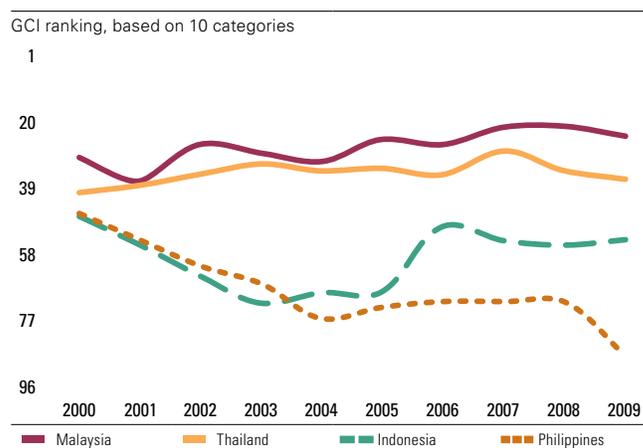


Figure 48. The competitiveness ranking of the region's middle-income countries declined or stagnated



THE NEED TO RAMP UP INVESTMENT

Fixed investment in developing East Asia (excluding China) is likely to reach pre-crisis levels this year, as will its direct contribution to growth. Private investment has been the driver of the recovery of the overall investment, but fiscal stimulus packages supported the rebound in 2009 (see Section I).

But are current investment levels adequate to support strong growth over the medium term? Historical precedent suggests that sustained higher levels of investment are critically necessary, along with much-improved efficiency of investment. Only in Indonesia among the middle-income countries of Asia (excluding China) is investment now above the levels reached before the 1997–98 Asian financial crisis (Figure 49). Investment rates in Thailand, Malaysia, and the Philippines have yet to recover, and in the case of the rates of Malaysia and the Philippines they are among the lowest in middle-income countries worldwide. Another reference point is provided by the Growth Commission, which concluded that for robust and high growth, investment rates of 25 percent of GDP or above are needed.⁵ (Only Indonesia and Thailand have investment rates of 25 percent of GDP or higher.) Most important, however, investment rates in the middle-income countries of East Asia are below the 31 percent averaged by Korea and Japan during their economic take-offs (Figure 50). It is this reference point that is most relevant for East Asia; other comparisons invariably include countries that sustained rapid growth for a few decades but failed to escape the middle-income trap.

Figure 49. In Malaysia, the Philippines and Thailand, investment is below the levels of the previous two decades...

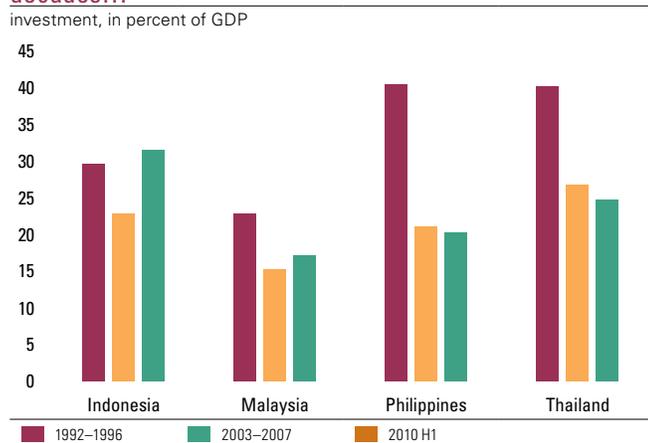
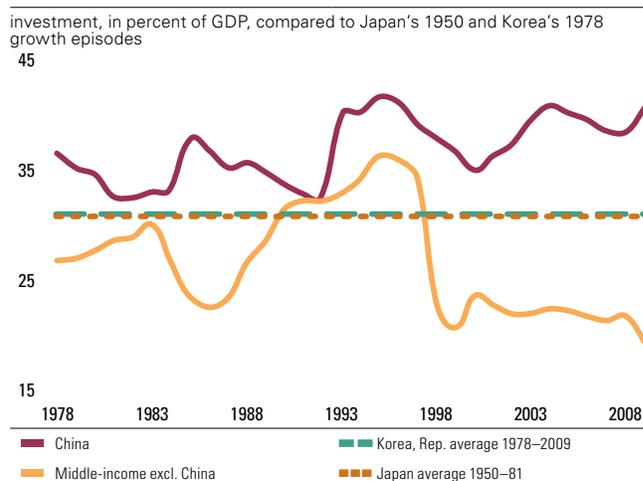


Figure 50. ...and is trailing levels in Korea and Japan during their take-offs



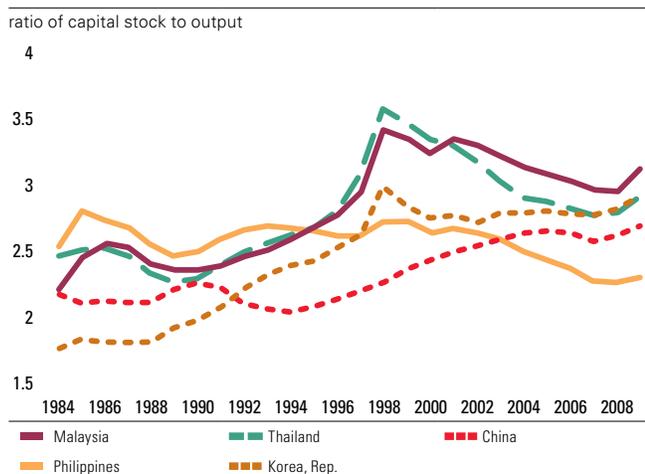
Relatively low investment rates in the middle-income countries of East Asia (excluding China) do not appear to be due to insufficient saving. Saving rates in these countries have not changed for more than a decade, but investment rates have declined in most of them. As a result, countries run current account surpluses. These countries are, in fact, exporting capital. Encouragingly, countries appear to be using capital more efficiently of late

⁵ Growth Commission. 2008. *The Growth Report: Strategies for Sustained Growth and Inclusive Development*, p. 34, www.growthcommission.org.

(Figure 51). This is a common phenomenon for periods after crises, including after the Great Depression during the 1930s, and across the world's advanced countries following the recent economic crisis. It reflects improved capacity utilization and restructuring of business activity resulting in enhanced productivity (although capital to output ratio is an imperfect measure as it could also indicate a change toward less capital-intensive industries). The challenge is to build on the recovery from the crisis and boost investment in physical and human capital to help not only support stronger immediate growth, but create the appropriate structure to support vibrant and innovative companies within dynamic clusters and livable cities, and elevate the skills of the workforce that will support higher and sustainable economic expansion over the longer term.

Consider infrastructure that has not been upgraded to keep up with the demands of growth and connectivity, and it has become a binding constraint in many countries in the region. In the Philippines, a key shortcoming is the quality of urban infrastructure, roads, ports, and airports. The high electricity costs and relatively high losses caused by blackouts are also a problem.⁶ Similarly in a recent survey in Indonesia, firms identified a large infrastructure gap, including in roads, as one of the greatest obstacles to private investment.⁷ In Thailand, in general, the quality of infrastructure is better than in most of its neighbors, but it could still be a lot better. Moreover, there is a large variance in the quality of infrastructure services across regions: logistics costs in the North and Northeast (the poorest parts of Thailand) are 50 percent higher than those in the Eastern region close to Bangkok.⁸ Ensuring a high quality of information technology (IT) infrastructure, together with affordable access, should also be a priority.

Figure 51. Most economies appear to be using capital more efficiently after the 1997–98 Asian financial crisis



Sources: Bosworth, B. and S.M. Collins. 2003, "Accounting for Growth: Comparing China and India," NBER Working paper 12943, February 2007, and Bank staff calculations.

Innovative technologies can help not only increase returns to investment and improve productivity, but also transform threats into opportunities. Given the region's large investment needs and the challenge posed by climate change, it is feasible that investment in the green economy will not only be good for the environment, but also good for business, and help position East Asia near the top in a sector poised for sustained rapid growth (Box 4).

Governments finance about three-fourths of the infrastructure around the world, and East Asia is no exception. But ongoing and effective mobilization of private capital for infrastructure investment through public-private partnerships (PPPs) will be critical for ensuring adequate resources, risk diversification by the public sector, and cost control.

6 World Bank. 2006. "Philippines Investment Climate Assessment." World Bank, 2008, Philippines Enterprise Survey.

7 World Bank. 2010. *Indonesia Rising: Policy Priorities for 2010 and Beyond*.

8 World Bank. 2008. "Thailand Investment Climate Assessment."

BOX 4. INVEST IN THE GREEN ECONOMY, BUT BEWARE OF WHITE ELEPHANTS

Climate change and energy security present both a challenge and an opportunity for the countries of East Asia. Energy consumption in the region is poised to double over the next two decades, following a similarly sharper increase since late last century. At the same time, rapid urbanization and industrialization, coupled with the surging energy use, have created some of the world's largest mega-cities, with challenges for livability. The opportunity is to help mitigate and adapt to the adverse consequences of climate change, while turning the challenge into growth. The much-needed new investment could be used to adopt innovative technologies that increase productivity and efficiency of the capital stock. Some will be viable on their own, while others may need a certain level of public support to become profitable. In all cases, however, these should offer companies in the region the possibility to move up the value chain in a sector experiencing rapid global growth and where there is international capital to be attracted home.

The fiscal stimulus packages introduced during the recent crisis boosted spending on green technologies in many countries. Globally, the share spent on green energy appears to have been the largest in the case of Korea, with over 80 percent of the total stimulus. China has been the leader in absolute terms, spending more than twice that of the United States in 2009, with pledges of investments of about \$400 billion in public funds through 2013. Government spending helped finance the doubling of wind-power capacity—each year for five years in a row—and is now invested in an unprecedented expansion of high-speed rail.

Technologies that help improve energy efficiency have been identified as priority by several countries. Combined heat and power generation (or cogeneration) is one example. Currently, only 13 percent of China's domestic electricity consumption is provided through cogeneration facilities. When such facilities are combined with district heating and cooling (DHC) systems, further synergies can be created. Depending on the construction and implementation of a DHC facility as well as the size and number of buildings, total capital and investment costs can be lower than more traditional options for heating and cooling individual buildings. Changes in building design to improve energy efficiency, such as through insulation, represent similar technologies for which demand currently exists. On top of these gains, these and other energy efficiency measures will significantly reduce carbon emissions.

Some green technologies have substantial poverty reduction or inequality mitigation benefits (see also Section I). For example, renewable energies such as solar power can facilitate rural electrification, which is known to help reduce poverty.⁹ For example, 4 percent of Lao PDR's population in remote areas have been provided with solar energy, with significant implications for poverty reduction. Wind and solar power technologies can provide off-grid power from non-fossil fuel sources. However, they must overcome financing challenges, and secure investment for further production and use. Vietnam's legislation to facilitate such investment in renewable energy and rural

9 World Bank. 2000. *Energy Services for the World's Poor. Energy and Development Report 2000*. ESMAP, World Bank, Washington, DC.

electrification illustrates the recognition that these technologies can be important for achieving development objectives.¹⁰

As with every investment, ensuring the efficiency of outlays in green technologies is paramount. Too often public funds get misallocated or finance “white elephant” projects, with minimal contribution to the economy or potential waste, despite good intentions. For example, many of China’s green investments are in wind technology. However, some analysts report that a high proportion of China’s current wind assets might be either not in use or not connected to the national power grid. In other cases, promoted new technologies can be far from the economy’s comparative advantage or their subsidization can harm competitiveness. In this sense, measures that let the market provide direction when subsidizing or investing in green economy are preferable.

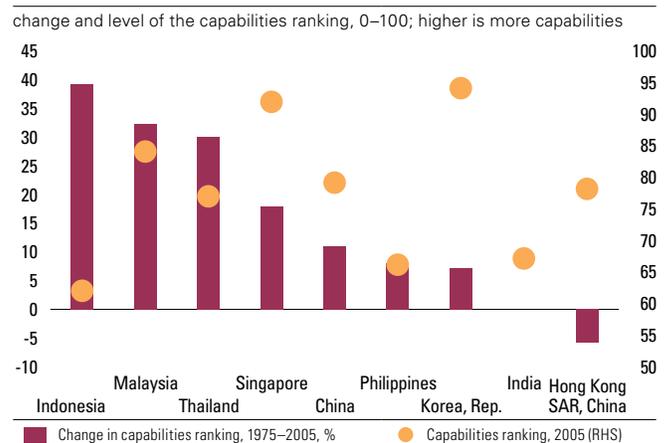
10 World Bank. Forthcoming. “Climate Change and Economic Policies in APEC Economies: Synthesis Report.” Report No. 56562-EAP, East Asia and the Pacific Region, World Bank, Washington, DC.

FACILITATING INNOVATION

The middle-income countries of East Asia have made remarkable progress exploiting a model of high volume, low value added assembly operations for exports. But this model is reaching its limits, and countries are facing the need to move up the value chains. This will require that companies become more innovative at introducing new or improved goods and services, developing or adopting innovative production processes and better modes of business operation (see Box 5).

Most of East Asia’s middle-income countries have absorbed foreign knowledge and improved their production capabilities in the process. Production capabilities, or the level of sophistication of the country’s companies to produce diverse products, have grown rapidly in East Asia in large part through participation in global or regional production networks and the accompanying technology transfers.¹¹ Nonetheless, these countries innovate at par or below compared with middle-income countries in other regions (Figure 52 and Figure 53). But East Asia’s competitors, notably

Figure 52. Change in the number of “capabilities” to produce new products, 1975 to 2005



Source: Staff calculations based on Hidalgo, César A. 2009. “The Dynamics of Economic Complexity and the Product Space over a 42-Year-Period”, CID Working Paper No. 189, December 2009.
 Note: Capabilities refer to the level of sophistication of companies in a country to perform more tasks so as to produce a greater variety of products. Original indicator is normalized so that higher number reflects more capabilities, Japan=100.

11 Brahmabhatt, M., and A. Hu, 2007. “Ideas and Innovation in East Asia.” World Bank Policy Research Working Paper 4403, World Bank, Washington, DC.

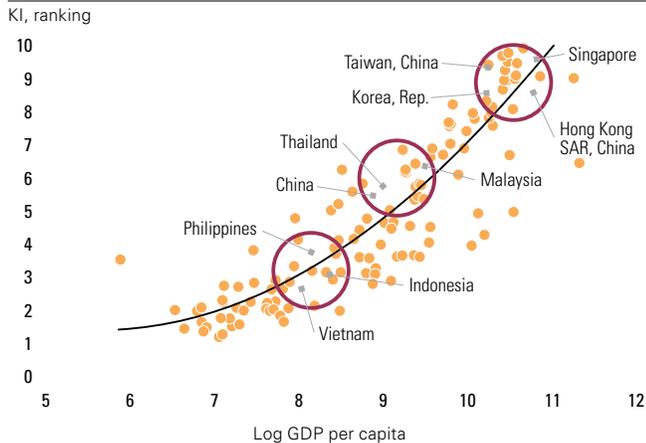
BOX 5. WHAT IS INNOVATION?

Innovation includes activities that advance the technological frontier and adoption of existing knowledge and production processes—sometimes in a better way. Innovating at the frontier requires sophisticated education, continuous investments in research and development, and property rights, while benefits may accrue only after a substantial period of time. Most companies in developing countries, including in middle-income East Asia, by contrast, are innovating inside the frontier by absorbing knowledge, typically from abroad, through international transfers and spillovers. Even the simple use of existing knowledge can be innovation, from a perspective of a company (that adopts a new product line, for example) or a grassroots entrepreneur (who starts using a phone for a financial transaction, for example). The most productive and inclusive kind of innovation seems to be in the middle when firms can be “piggybacking” through technological change: leapfrogging to wide use of new technologies by piggybacking on the existing knowledge and patent base.

those in Latin America and the Middle East, are mostly countries that have been caught in the middle-income trap. Innovating more, rather than as much as others, will be crucial for East Asia’s middle-income countries to break out of the middle-income trap. It is the NIEs, Japan and the advanced economies that middle-income Asia has to look up to.

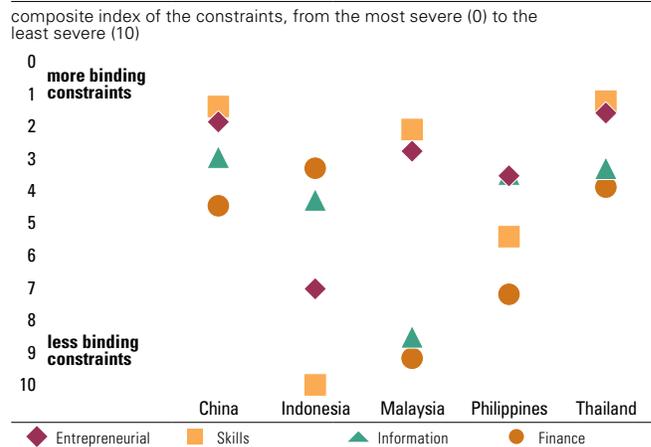
There is steady progress by the authorities of East Asia’s middle-income countries on the agenda for facilitating innovation, but more is needed for the transition to high-income status. The previous section discussed the need for improving infrastructure in middle-income countries, including roads, housing, energy, and information technology. Along with larger government outlays, the need for stable and enhanced foreign capital inflows is crucial, as these bring along knowledge and management expertise. Components of good innovation policy

Figure 53. East Asia’s middle-income countries are innovating at par with comparators with similar income levels



Source: World Bank Knowledge Assessment Methodology Innovation Index (KAM) 2009.
 Note: KI on the vertical axis refers to the Knowledge Index that is a simple average between innovation, skills, and ICT indices.

Figure 54. Firms in middle-income countries are constrained by different factors in their innovation efforts



Source: World Bank staff calculations using World Bank Enterprise Surveys (latest available) and Connectivity Scorecard 2010.
 Note: Index is scaled by maximum and minimum in the region.

are the following four agendas: creating incentives for productive entrepreneurship, providing adequate skills to the workforce, ensuring good transmission of information and ideas, and making sure financing is available for start-ups, upgrades, and commercialization.¹² Based on the surveys of entrepreneurs, binding constraints to innovation differ by country (Figure 54), and we turn to each of these four facilitating or constraining factors below.

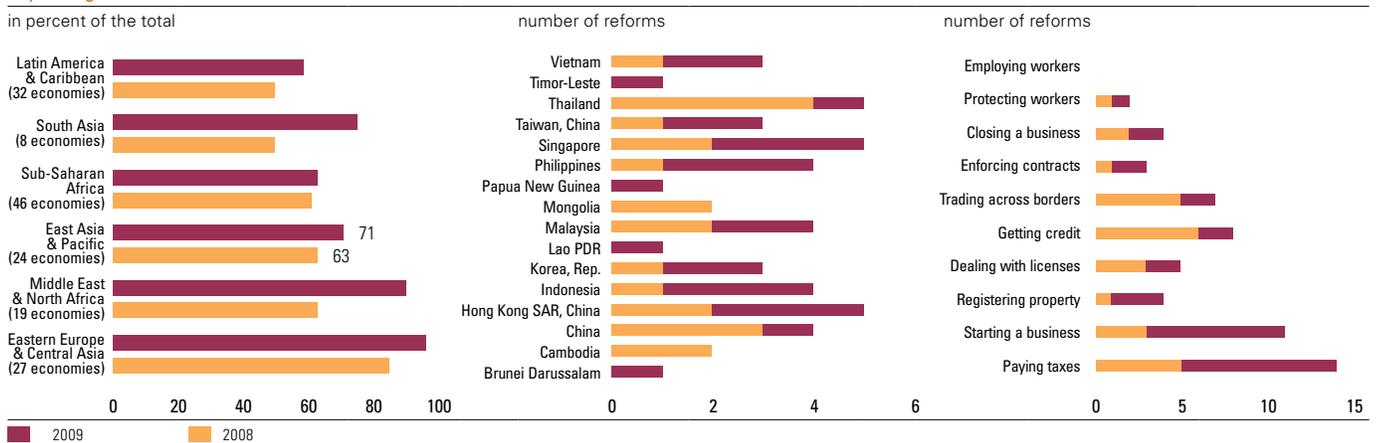
INVESTMENT CLIMATE FOR INNOVATION

Creating incentives for entrepreneurs to experiment is a key challenge in creating an innovative economy. Overall, an environment conducive to innovation is similar to the environment conducive to attracting foreign investment. The key components of such an environment include macroeconomic and regulatory stability, clearly defined property rights, well-articulated and not too onerous policies for competition, and business entry and exit.

Countries in the region sustained progress on structural reforms during the economic and financial crisis. As policy support for growth is gradually withdrawn, advancing reforms in East Asia’s middle-income countries becomes imperative if rapid growth is to be maintained. Two-thirds of all economies in the region enacted one or more reforms to improve the business environment over the last several years (Figure 55). Starting a business, paying taxes, getting credit, and trading across borders were the main areas of reform in the region in 2009.

Figure 55. Structural reforms proceeded at full speed during the crisis

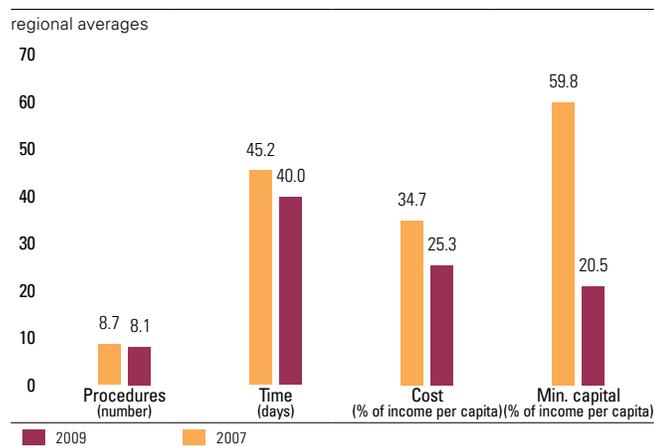
The share of economies with at least one reform in ... as did the number of reforms across economies ... although they varied across categories improving the business environment increased...



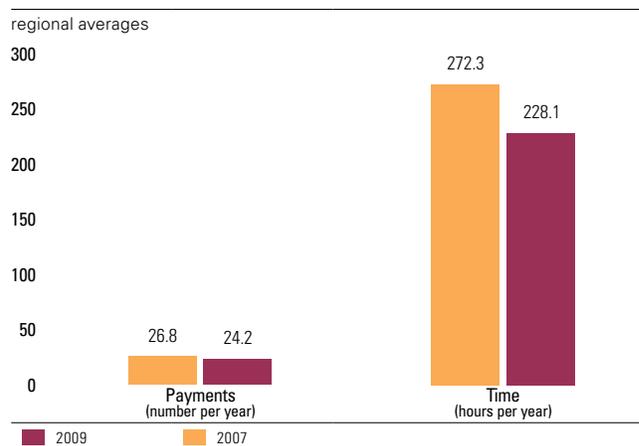
Source: Doing Business 2009.

Important entry and exit regulation reforms have made mixed progress. One-stop shops for business registration and online filing were also introduced in some economies to streamline the registration of new firms. As a result, the time to start a business was reduced in 10 economies between 2007 and 2009, and the cost of business registration fell in almost as many (Figure 56). At the same time, there has been modest progress in simplifying the rules for closing a business. Since the mid-2000s, the average time for middle-income East Asia to close a business has declined from 4 years to 3.8 years, but this still prevents assets from reallocating to more productive uses. By

12 Canuto, O., M. Dutz, and J. G. Reis. 2010. “Technological Learning and Innovation: Climbing a Tall Ladder.” Economic Premise 21, July.

Figure 56. Starting a business in East Asia is now easier...

Source: Doing Business 2009.

Figure 57. ...and the administrative burden of paying taxes has been reduced

Source: Doing Business 2009.

contrast, the time to close a business in Singapore is 0.8 year and in Korea, 1.5 years. This difference is even starker than the time to start a new business, and presents a challenge to authorities in the region as they strive to ensure a thriving and dynamic private sector.

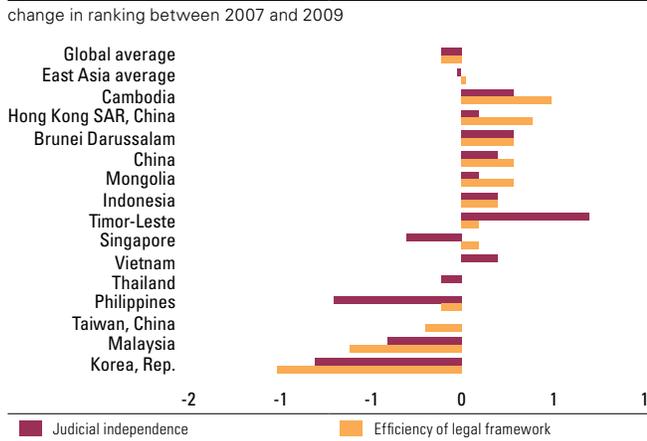
Improved tax administration also helped ease the administrative burden on firms. Some of these efforts were part of the fiscal stimulus measures many countries implemented (Figure 57). Indonesia, China, and Timor-Leste, simplified their tax structure, introduced low flat corporate income tax rates, and helped level the playing field for domestic and foreign firms. In Indonesia, the corporate income tax rate was further reduced by 25 percent in 2010. In China, a new law equalized the treatment of domestic and foreign firms in terms of income taxation for the first time since 1978, including through a flat corporate income tax rate at 25 percent, and unified criteria for tax deduction and exemption. In Timor-Leste, the corporate income tax was reduced from 30 to 10 percent, and both the alternative minimum tax and the withholding tax on interest were abolished.

There has been progress on competition policy and protection of property rights. Encouraging competition, notably through foreign entry, may depress innovative activity by domestic firms. At the same time, productivity spillovers encourage the more efficient allocation of resources and stimulate entry of other, more agile companies. Stronger patent rights in large middle-income countries, for example, are shown to have the most significant impact on foreign companies to export, given the threat of imitation and reverse engineering.¹³ At the same time, such rights appear to have a limited impact on inflows of foreign direct investment to these countries, very likely because the inflows typically are for low-cost assembly rather than knowledge-intensive production.

Despite incipient protectionist pressures worldwide, countries in the region have resisted introducing curbs on international trade in goods and services. Some tariff increases introduced at the beginning of the crisis were subsequently reversed. And from the start of 2010, in line with the ASEAN-China Free Trade Agreement (FTA) that came into effect in 2005, six ASEAN countries (Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore,

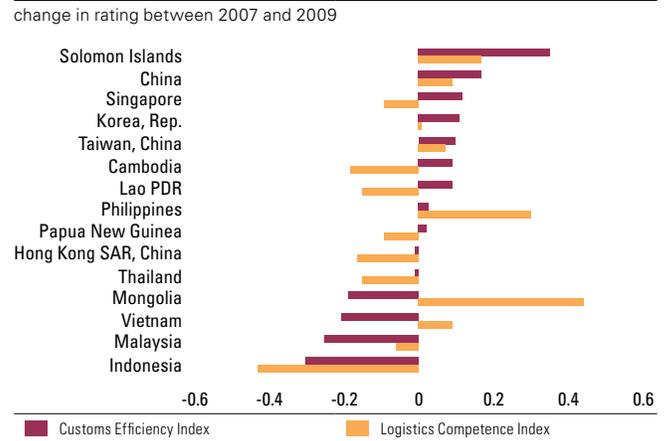
13 Gill, I., and H. Kharas. 2007. *The East Asian Renaissance*, World Bank, Washington, DC.

Figure 58. Progress improving the efficiency of the business-related legal framework was mixed...



Source: World Economic Forum Global Competitiveness Report 2009.
 Note: Judicial independence (1 = heavily influenced; 7 = entirely independent); Efficiency of Legal Framework (1 = inefficient; 7 = efficient).

Figure 59. ...as were advances in trade facilitation



Source: Logistics Performance Index 2007, 2010.
 Note: Indices range from 1 to 5 (best performance).

and Thailand) and China reduced tariffs on 90 percent of trade between them to zero over time. Other restrictions remained, however. For example, in Indonesia, the imports of food, textiles, footwear, toys, and electronics can still be processed only through five ports. Progress on trade facilitation has similarly been mixed. Some progress was made in simplifying documents, automating customs functions, and introducing better risk management approaches. Progress was similarly made toward an ASEAN single window and in improving the timeliness, customs efficiency, and logistics competence in some countries, although there remains much room for improvement (Figure 58 and Figure 59).

Economic integration within the region and with other countries proceeded apace. Trade has been a key driver of the prosperity of ASEAN countries, and along with it the diffusion of knowledge. Their total trade volume of US\$1.5 trillion in 2009 was roughly the size of their combined GDP. About 25 percent of their trade is intra-ASEAN. Although this internal trade includes a large variety of goods, it is dominated by trade of raw materials and machinery and equipment, suggesting that there is considerable scope for further trade integration by increasing the share of final goods in trade flows. Intra-ASEAN trade is underpinned by the ASEAN Free Trade Agreement of 2003 under which member countries have cut the tariffs on ASEAN trade to 0–5 percent but without any common external tariffs. ASEAN has also boosted regional trade in recent years by signing free trade agreements with Australia, China, India, Japan, and Korea.

Future integration will be guided by ASEAN’s goal to establish an ASEAN Economic Community by 2015. The countries aim to develop a single market with a free flow of goods, services investment, skilled labor, and a more liberalized flow of capital. Three issues will need particular attention as the Economic Community is established. First, behind the border issues such as trade infrastructure and institutions will need to be addressed as a priority. In particular, improvements in ports and Internet services have the potential of improving ASEAN trade by more than 10 percent. Second, greater harmonization of standards and removal of impediments to cross-border trade in professional services, finance and investment, education, and health are needed. Finally, facilitating the cross-border mobility of skilled labor is needed. To this end, countries need to establish protocols for mutual recognition of professional certificates among ASEAN member countries.

GETTING TOGETHER: INDUSTRIAL CLUSTERS AND CONNECTIVITY

Innovative companies need tighter connectivity at home and abroad, knowledge-related infrastructure, and well-defined policies to encourage the formation of clusters in urban centers. Technological clusters have been proven to be the process by which innovation transmits in manufacturing. Information and communication technology (ICT) has been shown to be the main driver of transmission of innovative information generally, and in our region in particular.¹⁴ Box 6 shows how ICT technology can help connect the entrepreneur where physical infrastructure fails or is not viable. The section below delves into the role and prospects of cluster development.

Globalization has resulted not just in a closer integration of economies but also a tightening of the linkages among East Asian major cities. Advances in ICT and transport technologies, together with the modernization of urban infrastructures, have facilitated interaction among cities at many different levels and contributed to the emergence of global urban regions. Cities like Shanghai, Seoul, and Bangkok lie at the core of urban regions and benefit from agglomeration economies arising from specialization, the scale of production, and from industrial diversity that promotes spillovers and the emergence of new activities. Research suggests that each doubling of city size can raise productivity by between 3 and 14 percent. Urban regions are characterized by a concentration of services, high-tech and creative activities and nascent industries in the core city, with large-scale manufacturing coalescing in nearby medium-size cities and more specialized cities. This arrangement optimizes the gains from urbanization economies in the core city and localization economies in the hierarchy of medium- and small-size cities in the urban region.

Globalization has created new channels for comparing experiences and sharing lessons. At the same time, it has sharpened the competition for final goods and mobile human capital. This competition is multidimensional, and it is forcing cities within urban regions to take a holistic approach to development and to compete on many different fronts, the business climate and the urban infrastructure being just two areas, with others such as livability and urban amenities acquiring more significance.

To attract resources and sustain the momentum of development, cities need to demonstrate their ability to enhance growth potential by cultivating a number of vibrant and preferably interlaced leading subsectors. Growth potential also depends on the demographics, whether the population is expanding or not, and the quality of the workforce. Quality, more than the volume of human capital, appears to be a more significant determinant of growth. Recent research also seems to suggest that in view of the importance of entrepreneurship, innovation, adaptation, and invention for technological convergence among countries, the absolute quality of talent and skills might have a strong bearing on economic performance.

The growth imparted by leading sectors can be magnified by the formation of specialized clusters of networked firms that compete, cooperate, deepen markets for labor, give rise to intangible capital, generate technological spillovers, and promote start-up activity. A symbiotic relationship between manufacturing firms and services providers as is emerging in the Bangkok, Hong Kong SAR, China/Shenzhen/Guangzhou/Dongguan and Seoul urban regions, for example, can lead to an unbundling of activities and to greater specialization to the advantage of both parties. A significant share—close to 37 percent—of the employment generated by the export

14 Gill, I., and H. Kharas. 2007. *The East Asian Renaissance*, World Bank, Washington, DC.

of manufactures by U.S. companies was in upstream and downstream services. In fact, manufacturing gives rise to employment multipliers of up to 5 and 6 that are far larger than the multipliers associated with services.

Clusters generally form around nuclei. Urban centers with a strong development orientation and leadership, such as Beijing and Shenzhen, are attractors and a preexisting industrial base can be a source of skills and intangible assets. These latter assets which include scientific and non-scientific research and development (R&D), software, worker training, brand equity, product design, and organizational capability, have accounted for 27 percent of the growth in the United States since 1995. Major research, oriented firms or multinational corporations (MNCs) can provide a nucleus as well, and there are plenty of examples from Cambridge U.K., Silicon Valley, Medicon Valley, San Diego, and elsewhere of firms such as CCL and Acorn, HP, Novo Nordisk, and Hybritech spawning scores of daughter enterprises and helping to scale up the activities of a cluster. MNCs and local firms are also giving rise to spin-offs and new starts in Beijing, Shenzhen/Guangzhou, Seoul, and Taipei/Hsinchu.

To thrive and grow, clusters require anchors. The size and affluence of the urban market (as in Seoul, Shanghai, and Tokyo) are among the most important, however; there are other anchors of consequence as well. Research universities have an increasing role if they can supply high-quality skills, contribute to network formation—local and global—and enrich the local knowledge economy by way of tacit knowledge, workshops, patenting, publications, trouble shooting, and the dialogue on technology. Vocational training institutions, the physical and social infrastructure, affordable housing, and recreational facilities are among some of the other anchors. How a city goes about developing these anchors determines its overall competitiveness in the global economy.

Competitive clusters must be capable of upgrading, diversifying, and incubating new industries. Silicon Valley, for example, has served as a breeding ground for several different kinds of clusters, and both Beijing and Shanghai are attempting to develop multiple high-tech activities. A dynamic cluster has a number of attributes. It has an entrepreneurial culture that leverages the resources of universities and firms; it benefits from the local presence of angel investors and venture capitalists who support and mentor local activities; it combines the advantages of specialization in key fields with an openness to new ideas; it has the capacity to learn from mistakes and to unlearn; and it has a “buzz” in national and global circles.

History shows that many clusters have formed accidentally. Examples include a decision to locate an important facility (such as the NASA space center in Houston), a university, or a firm that emerged as a major player in the industry (e.g., Dell in Austin, Texas, and arguably Huawei in Shenzhen). History further shows that these chance events might have floundered were it not for supporting initiatives taken by urban leaders and national governments.

The supporting policies can take many forms. Strategic foresight exercises can assist governments to map out a long-term cluster development strategy and undertake to provide the stable long-term financing for R&D that research-intensive activities frequently require. Complementing these are policies to ensure the supply of quality skills.

BOX 6. SMART INNOVATION IN THE PACIFIC: CONNECTING PEOPLE

The Pacific Islands include some of the smallest and most remote countries in the world. The Islands are facing daunting challenges on each of the dimensions of economic geography—density, distance, and division. Limited density of economic activity limits the scope for economies of scale and specialization. The countries' remoteness from the nearest large market results in higher costs of trade and limits the scope for participation in the production networks that are spreading rapidly throughout East Asia. And considerable divisions impede product and factor flows even within their own borders. Because of the constraints of economic geography, production costs—even for the small variety of products produced or sold in the Pacific Islands—are substantially higher relative to the rest of the world. Such a wedge will likely remain permanent in general, but for some industries it could be moderated by economic policies or new technologies that help reduce economic distance, and efforts to reduce division.

A recent innovation in tourism marketing demonstrates the effectiveness of information and communication technology (ICT) in mitigating the disadvantages of economic geography in the Pacific. This innovation—of a link to several Pacific islands on the Worldhotel-link.com Limited (WHL) portal—provides information about local accommodation and tour providers available to independent travelers. Local tourism operators market their products globally online through a collective tool, at a fraction of the cost of doing so individually, and without needing the requisite skills, Internet connection, computer, or even electricity supply. A mobile phone enables them to link to the local franchise-holder to process the bookings coming through the portal. This innovation has been enabled by the sharp drop in the unit cost of mobile phone calls following the recent liberalization of telecommunications markets in the region (Figure 60).

The benefits to local tourism have been significant. For example, in Samoa, the turnaround time for a booking has declined from several days to a few minutes. Over the last three years, the growth of revenues attributed to the portal was about 80 percent for Samoa, 90 percent for Fiji, and 130 percent for Vanuatu. In Vanuatu, the benefits

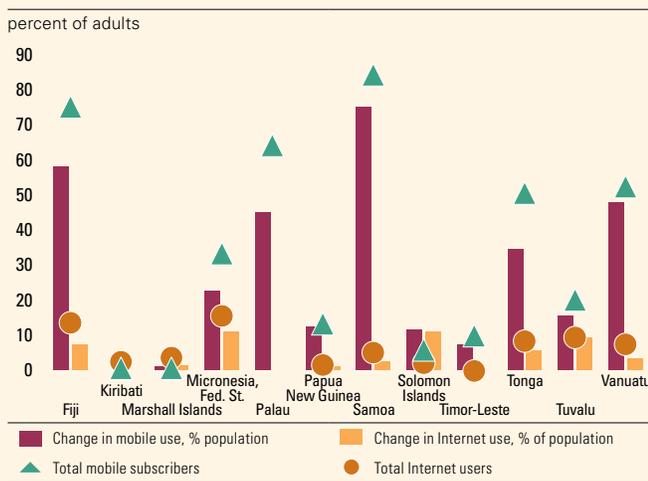
For cities, the incentive policies to attract industry—domestic and foreign—need to be supplemented by others that secure the city finances and ensure that services and housing meet the expectations of industry that is aware of and comparing opportunities in other cities throughout the world. But providing services and infrastructure is not enough; cities must also market themselves aggressively by organizing events and seeking out business nationally and internationally. Such marketing is the most reliable way of infusing capital and ideas into existing clusters and sowing the seeds of new clusters.

EQUALIZING OPPORTUNITIES FOR A CREATIVE WORKFORCE

Adequate skills of the workforce are important throughout the entire process of innovation, from the emergence of ideas to their implementation and commercialization. When large parts of the population do not have basic education or skills, it will curb agricultural productivity or that of informal or low-skilled sectors. Lack of secondary or vocational education will harm further development of services sectors and manufacturing. For innovation, good quality tertiary education can result in an effective collaboration of industry with academic institutes

of the WHL portal have been particularly noticeable for small-scale operators in rural areas and on outlying islands. In the two years of operation of the Solomon Islands portal, revenue grew by 770 percent, while the number of businesses featured on the site rose 70 percent.

Figure 60. Use of ICT mobile phones and Internet grew dramatically between 2002 and 2009



Sources: World Development Indicators, ITU, and World Bank, 2007, *Telecommunications in the Pacific*.
 Note: For Tuvalu, refers to Internet subscriptions.

For small and medium enterprises (SMEs) in rural areas and on outlying islands that retail products from wholesalers in the capital, mobile phones have significantly shortened the ordering cycle and reduced information asymmetries—such as in Vanuatu.¹⁵ This benefit has been most pronounced for retailers who previously had to travel to use public land lines. In the fisheries sector, entrepreneurs are now able to check and command supply, and inform in real time potential customers in hotels and restaurants of the status of their orders. In the agriculture sector, entrepreneurs can now simultaneously serve as vendors at the marketplace and manage customers’ orders.

15 Pacific Institute of Public Policy. 2009. *Social and Economic Impact of Introducing Telecommunications throughout Vanuatu*.

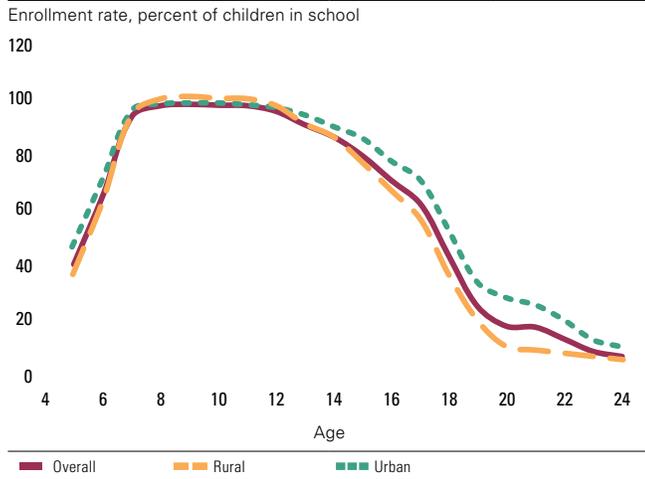
and universities. This facilitates the creation of clusters and industry incubators and allows innovative and productive clusters to form. Indeed, skills were the most binding constraint to innovation in most countries (Figure 54).

Developing East Asia is falling below international averages on education outcomes, hurting the scope for equipping the labor force with the skills needed to be innovators rather than simply users of new technology, according to the latest data.¹⁶ This is having a palpable impact on the ability of firms to move up the value chain. Manufacturing firms in Thailand, for example, cite the lack of skills as the foremost constraint to investment and innovation.¹⁷ Companies across the middle-income countries in the region, meanwhile, refer to the absence of entrepreneurial abilities as another crucial constraint to growth.

16 World Bank. 2010. *East Asia and Pacific Economic Update: Emerging Stronger from the Crisis*. www.worldbank.org/leapupdate.

17 World Bank. 2008. *Thailand Investment Climate Assessment*; World Bank. Forthcoming or 2010. *Industrial Development in the Bangkok Urban Region*.

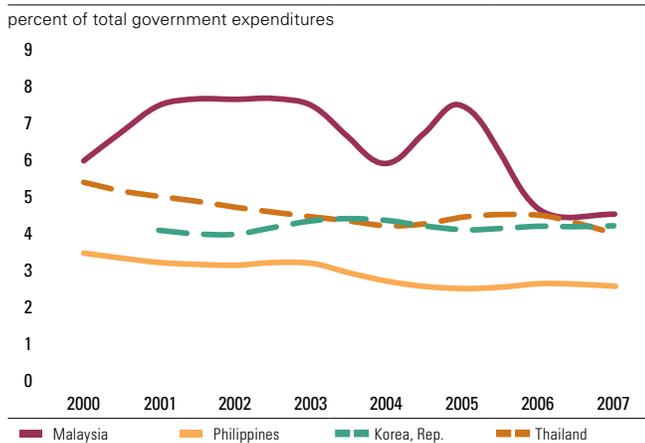
Figure 61. Enrollment rates differ between rural and urban areas, Indonesia, 2009



Source: Indonesia Socioeconomic Survey (SUSENAS) 2009.

than those in rural areas (Figure 61). Addressing constraints to schooling at the secondary and post-secondary levels may involve tackling challenges not only at the national but subnational levels. Where demand-side constraints are important, the authorities can focus on demand-side policies such as conditional cash transfers. In cases where supply-side constraints are important, interventions that improve physical access to schools or school quality may be most effective. Government spending on education as a share of total outlays in the middle-income countries in the region seems to be converging to 15–20 percent of the total—with substantial declines in Malaysia and Thailand from levels that were almost twice as large as in the other countries at the beginning of the decade (Figure 62). As Korea’s example demonstrates, more money is not necessarily the key to better education outcomes. But the

Figure 62. Public expenditures on education declined or remained broadly unchanged in most countries

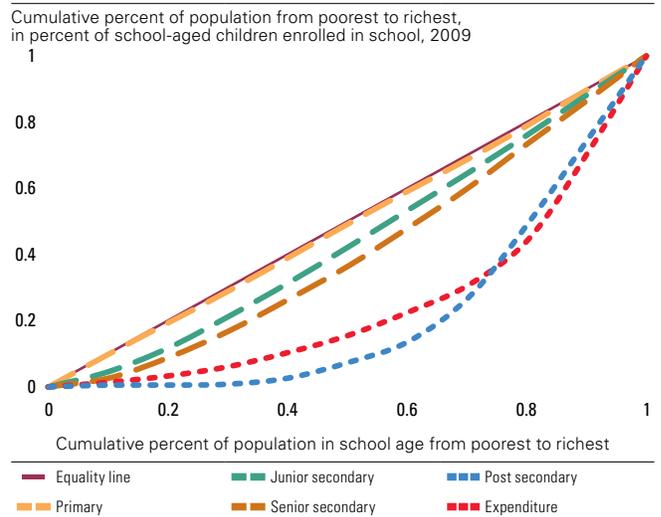


Source: UNESCO Institute of Statistics.

The quest to strengthen the quality of skills in the workforce needs to include equal opportunities for education to all. In most countries in the region, school enrollment is near universal between ages 7 and 12, but drops off thereafter. Policies and incentives to retain children in secondary schools should receive priority in most countries in the region. Without a proper secondary education, children are on a path of life-long lower wages, and the pool from which universities recruit the best and brightest diminishes substantially.

In most countries in East Asia rural-urban differences in enrollment rates are larger than disparities by gender. This is the case in Indonesia, for example, where enrollment rates for boys and girls are similar within rural and, separately, urban areas, but enrollment rates in urban areas are consistently higher

Figure 63. Post-secondary education is at least as equal as income in Thailand



Sources: Thailand Household Income and Expenditure Survey and staff calculations.

authorities in Malaysia and Thailand are reviewing education policies in the context of private sector concerns about lack of adequate skills and an innovative workforce.

In almost all East Asian countries, income equality has little impact on access to primary and senior secondary education (Figure 63). However, this is different for the post-secondary education, where access to schooling is at least as unequal as income. Government support may be needed to ensure that access to post-secondary education is more equitable, so that more people have the opportunity to become entrepreneurs and innovators.

FINANCE: FROM GRASSROOTS TO FRONTIER

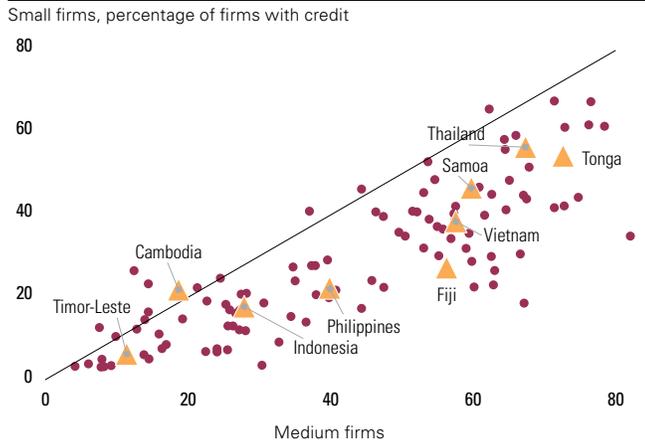
Even an educated workforce cannot innovate without adequate finance. Getting financing for innovative investments is difficult, because these are typically risky and unprofitable at the initial stages of the process. Still, large firms can finance their frontier innovations, technologies, and upgrades by accessing venture capital and bond markets or they can benefit directly from own or public resources. But middle-income countries innovate mostly behind the technological frontier. Those that do it better also have well-developed financial systems and policies to support venture capital companies. Such venture companies, and to a lesser extent the capital market, tend to finance many of the innovation activities in developing countries. A robust corporate bond market in East Asia is emerging, but it will take time until firms that are not investment grade are able to raise funds. But these sources of financing are not available where risk is considered too high or mentoring is needed to achieve results, such as for most of the grassroots innovators.

For grassroots innovation, improving the access of SMEs to financing is essential to ensure that small but powerful ideas can also be commercialized. SMEs account for more than one-half of formal employment in the region, and in some countries they are collectively the largest employer. Yet SMEs contribute only about 20–30 percent of GDP, compared with 40–50 percent in advanced economies.¹⁸ For small firms and innovative grassroots entrepreneurs, access to finance for innovative projects is a severe constraint. High transaction costs of dealing with start-ups and micro, small, and medium enterprises could make traditional financing unavailable to SMEs. One way to reduce such transaction costs, which has already been implemented in several countries in East Asia, can significantly improve access to finance for small firms.

Improving the access of SMEs to finance can contribute to productivity improvements and growth, and it will help to reduce inequality of opportunities (see also Section I). On average, only about a third of small firms in East Asia have a loan or a line of credit with a bank, compared to 50 percent of the medium-size firms and more than 60 percent of large companies (Figure 64). The financial crisis further reduced the availability of financing to SMEs, a development that has now been largely reversed.

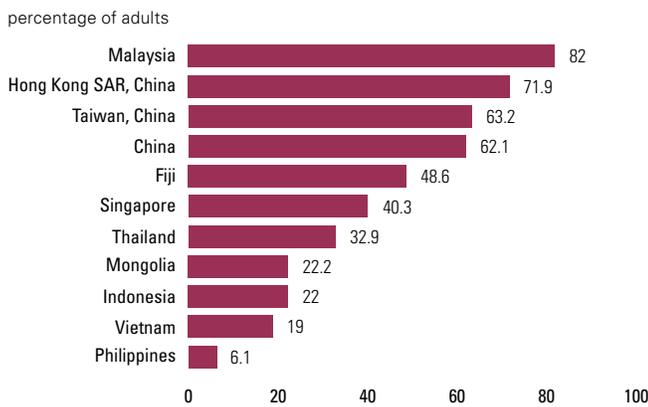
18 Ayyagari, Demirguc-Kunt, and Maksimovic. 2008. "How Important Are Financing Constraints? The Role of Finance in the Business Environment." *World Bank Economic Review*, November 2008, 22 (3): 483–516.

Figure 64. Small firms are more disadvantaged in finance than medium-size firms



Source: World Bank Enterprise Surveys.

Figure 65. Credit information systems still have partial coverage in many economies

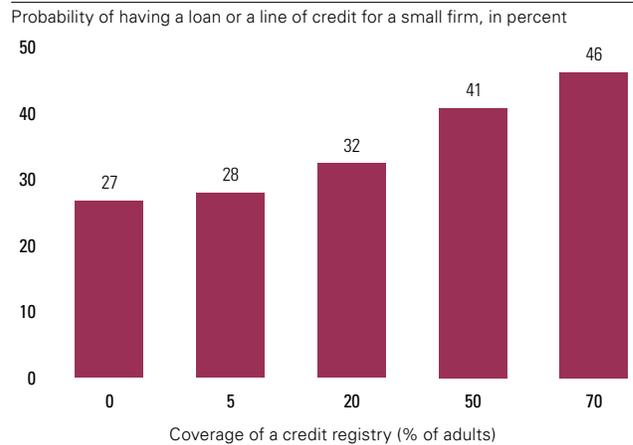


Source: Doing Business 2010.
 Note: The credit registry coverage is the maximum of the public and private credit registry coverage.

Small firms in countries with more comprehensive credit information systems are more likely to have better access to finance. Asymmetric information problems apply to all credit market segments, but are especially acute for the SMEs. Credit registries that collect data on loan repayments help reduce information asymmetries and enable lenders to lower the costs of processing loan applications (Figure 66).

The coverage of credit information systems in East Asia increased from about 5.5 percent of adults in 2004 to about 15 percent in 2008. China has led the way, with coverage rising from nearly nil to 62 percent of adults in the last five years. In Indonesia, Mongolia, and Vietnam, registries now include 20 percent of adults compared to nearly zero five years ago. And in Thailand coverage doubled from 15 to 33 percent in the past five years (Figure 65).

Figure 66. Small firms are more likely to obtain a loan in a country with a comprehensive credit information system



Source: Staff estimates based on the World Bank Enterprise Surveys and the Doing Business database.
 Note: Estimate of a probability to have a loan or a credit line for a small, domestic, non-exporting firm with female ownership, under five years old, using the Internet, with reliable access to electricity. Based on enterprise surveys data for 27,565 firms in 104 countries, controlling for country-specific factors. Credit registry coverage is a maximum of public or private credit registry coverage.

BOX 7. SOME LOW HANGING FRUIT IN SME FINANCING

The establishment of an SME credit bureau in Malaysia is a recent example of a successful public-private partnership to improve access to finance. The SME credit bureau was formed as a joint venture between Credit Guarantee Corporation Malaysia, Dun and Bradstreet (D&B) Malaysia, and the Association of Banks, with the leadership of the central bank. The bureau provides a range of analytical tools to lenders by combining historical information from the credit registry operated by Bank Negara and the expertise of D&B. Thanks to SME credit scores that the bureau now calculates, banks have reduced processing times for loan applications, in some cases in half.

The establishment of an online registry for pledges of receivables by the People's Bank of China is another example of improvement of the financial infrastructure. Less than two years after it started operation, 75,000 notices of security interests have been registered representing loans that total \$570 billion. More than 48,000 SMEs are registered as secured debtors and are benefiting from increased access to credit.