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MIDDLE-INCOME
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EIGHT THINGS YOU SHOULD KNOW ABOUT MIDDLE-INCOME TRANSITIONS

The EBRD seeks to foster the transition to an open market-oriented economy and to promote entrepreneurship in the economies where it invests. To perform this task effectively, the Bank needs to analyse and understand the process of transition. The purpose of this publication is to advance this understanding and to share our analysis with partners.

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FOREWORD

Around 5.5 billion people, or three-quarters of the global population, live in middle-income countries. The social and economic development of these countries matters to the whole world, as a source of human capital and savings and as a large market for exporters from both rich and poor nations. However, while middle-income countries continue to catch up with their advanced peers, they are not catching up as quickly as they did during their transition from low to middle income. Some have actually stopped converging.

The difficulties experienced by many countries in progressing to high-income status have fuelled the debate on the “middle-income trap”, a concept first put forward in 2007 by then-World Bank economists Indermit Gill and Homi Kharas.¹ They argued that the development challenges faced in the transition from middle to high income were qualitatively different to those encountered by poor countries and that the further development of middle-income countries, therefore, required new growth models and new institutions. Countries that failed to reinvent themselves got stuck in “the middle-income trap”.

Over the past decade, economists have studied the middle-income trap extensively. In quantitative terms, finding the “Holy Grail” – the exact “trap threshold”, either in absolute income per capita terms or relative to the frontier – has been elusive. There is no simple measure for identifying the precise level of income at which countries need to reinvent themselves to avoid or escape the middle-income trap. In qualitative terms, however, the concept of needing to reform the development model at some intermediate level of income still holds. For every “trapped” middle-income country, economists can identify the reforms that should have been implemented. And for every successful middle-to high-income transition, we can point to the reforms that underpinned it.

The quintessential success story of such transformation is South Korea, which moved from low to middle income by capitalising on the might of large industrial conglomerates (chaebols). With the support of the government, the chaebols mobilised resources and coordinated the large-scale investment needed to industrialise a formerly backward economy. However, by the late 1990s, this growth model had outlived its potential, resulting in a major financial crisis in 1998.

South Korea did not “waste a good crisis”, however. It seized the moment to restructure the chaebols, promote competition and innovation, and transform its industrial economy into a post-industrial, knowledge-based one.



Contrary to conventional wisdom, South Korea is not alone in its achievements. There are quite a few successful middle – to high-income transitions. In this report, we discuss what current “middlers” can learn from them. The recipe is well known, of course: good governance, competition, labour mobility, innovation, integration into the global economy, financial development, investment in human capital and sustainable infrastructure. Alas, there is no one-size-fits-all policy mix, but our analysis of past successes offers many useful takeaways for policymakers interested in breaking out from the middle-income trap.

While learning from the past, it is crucial to look to the future. Today’s middle-income countries are facing a very different environment to that of their predecessors. The global economy is now much more open. Cross-border transportation, investment and trade costs are much lower. Skilled workers are far more mobile. Technological change promotes globalisation and this is reinforced by economic openness. Innovators are now competing for the global marketplace. This is an unprecedentedly large market and innovators’ incentives to win market share are far stronger. Their resources are also much more scalable (due to cross-border flows of skills, ideas and capital). Not surprisingly, technological change is accelerating.

¹ See Gill and Kharas (2007).

This presents new challenges for today's middle-income countries. First, they are facing "premature de-industrialisation". In the past, development was about industrialisation (moving people from farms to more productive factories) followed by de-industrialisation (moving labour into high-skilled services). Thus, de-industrialisation has always been (and still is) an essential part of the middle – to high-income transition. Today, however, industry's share of GDP and employment is peaking at substantially lower levels than in the past. This means that middle-income countries have to create high-skilled service jobs at lower levels of development and, therefore, at a lower level of human capital. This premature de-industrialisation is, of course, an implication of globalisation and technological progress. In the past, industry would move from countries with high labour costs to poor or middle-income countries. Today, industry is staying in high-income countries, or even moving back to them, as automation reduces the need for cheaper labour.

Premature de-industrialisation leads to the second challenge: middle-income transition today relies more than ever on moving to a knowledge-based economy, fuelled by innovation and investment in research and development (R&D). This is harder to do in the modern world, where innovation and research are carried out by skilled workers who are increasingly mobile. Their wages are now driven by returns on their skills in the global, rather than the local, market. As we discuss in this report, empirical analysis shows that returns on R&D investment are highest in middle-income countries, implying rich opportunities, but also a dearth of such investment.

The third challenge, also related, is inequality. The march of globalisation and technological progress polarises the job market not only in advanced economies, but also in middle-income countries. Because of premature de-industrialisation and the difficulty of creating a sufficient number of highly skilled jobs, middle-skilled workers lose jobs and either move to the low-skilled segment of the labour market or leave the labour force altogether. A modern middle-income-transition policy mix should, therefore, include a focus on social safety nets and access to public goods for those without employment, as well as life-long upskilling and reskilling.

Fourth, many middle-income countries, especially those in the EBRD regions, are ageing rapidly. As the ratio of labour force to population shrinks, it is becoming harder and harder to lift per capita income. Advanced economies address this challenge through immigration, automation and longer working lives. Many

middle-income countries, however, are seeing emigration and lag when it comes to automation. What's more, older cohorts of their populations cannot work as much as their peers in rich countries due to under-developed healthcare systems.

The fifth challenge is climate change. According to the environmental "Kuznets curve", it is the middle-income countries that may pay a higher price in terms of pollution. Poor countries are not as heavily industrialised as their middle-income cousins and rich countries, with their service-based economies, are already on a de-industrialising path. It is the middle-income countries that have a higher share of polluting industries. So, as the world strives to implement the Paris Agreement, middle-income countries will face a disproportional challenge. Fortunately, there are reserves to tap. Many middle-income economies still have substantial fossil-fuel subsidies. As these are removed, there will be greater incentives for companies to "green" their business models and additional resources for governments to support the green transition, in particular, by investing in sustainable infrastructure.

In addition to investment in skills, healthcare, R&D and sustainable infrastructure, middle-income transitions should be supported by financial development. Here, the main challenge is not just quantity, but also the structure, or quality, of finance. Most middle-income countries lack deep and broad equity markets. This is unsurprising, as (unlike debt) equity requires strong governance. On the flip side, if and when governance (at the national, local or company levels) is improved, equity markets will help resolve many of the challenges outlined above. The development of equity markets will promote innovation and the creation of knowledge-based sectors of the economy, help mitigate the social impact of ageing and even provide incentive for a green transition. Equity holders are long-term residual claimants on the value of corporate assets and it is in their interest to invest in assets that will not be stranded due to climate change or anti-climate-change regulation.



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OVERVIEW

Rapid transitions from low to high levels of per capita income – middle-income transitions – are challenging, as they require rethinking the development model and simultaneously investing in old and new economic capabilities. Nonetheless, economic history points to a number of successful transitions, such as that of South Korea. Over time, technology has altered the formula for success. Knowledge-intensive services can now be exported much like manufacturing products were in the past, while manufacturing employs fewer workers. Building social safety nets and making economic growth greener are increasingly important elements of middle-income transitions, while other ingredients have become even more crucial. Investment, for example, remains the single most important determinant of exceptional economic growth long term and is a function of quality of governance and skills. Simply throwing money at the problem does not seem to make a successful middle-income transition more likely, as the quality of finance plays an important role.

Many economies in the EBRD regions have reached or are approaching middle-income levels.² Since the global financial crisis of 2008-09, these countries have also experienced a marked slow-down in the rate at which their per capita income is converging on the level of advanced economies.

Could countries in the region become trapped in a cycle of weak growth at the middle-income stage of their development? And what can be learned from the history of successful (and less successful) transitions from low- to middle- to high-income status (known as the “middle-income transition”)?

Similar questions have been raised before. The term “middle-income trap” was originally coined in 2007 by Indermit Gill and Homi Kharas to refer to the marked slow-down in South-East Asia’s economic growth following the 1997-98 financial crisis.³ The question of whether such a trap exists at a specific level of income has been the subject of heated debate ever since.⁴

In this report, we revisit middle-income transitions around the world since the mid-1950s and make eight observations about these experiences that hold valuable lessons for middle-income economies today. These observations are mostly intuitive. Yet, there are important nuances that distinguish them from commonly held beliefs about the middle-income trap.

Careful examination of the data fails to identify a middle-income trap, as such, at a specific level of per capita income. Unsurprisingly, economic growth tends to slow as countries grow richer. Yet this is true for all levels of income (possibly with the exception of the poorest economies). A more nuanced pattern can be observed in total factor productivity – the residual in growth accounting that reflects the efficiency with which capital and labour inputs are combined to produce output.

Productivity growth tends to slow in countries where income is around one-third to three-quarters that of the USA, but it picks up again in the group of advanced economies. This is down to the structural transformation that middle-income economies have to undergo as they grow richer. In the early stages, economic development is primarily driven by the use of existing technologies and improvements in the efficiency of production. This is true for any sector, from basic textiles to smartphone assembly. Advanced economies, in contrast, generally enjoy a comparative advantage in terms of innovation and the design of global value chains. Within the same sectors, advanced

² In our analysis, we refrain from using specific income thresholds. If we define middle income as one-third to two-thirds of the income per capita of the United States of America (USA), we are talking about US\$ 20,000 to US\$ 40,000 at purchasing power parity (PPP) or market exchange rates as of 2018. In contrast, the World Bank defines upper-middle income as US\$ 7,650 to US\$ 19,800 at PPP.

³ See Gill and Kharas (2007).

⁴ See, for instance, Eichengreen et al. (2015).

“ Successful middle-income transitions are relatively rare, but they do exist and are more diverse than commonly thought

economies tend to design smartphones and organise the global supply chains that assemble them, or design high-brand apparel using fabrics produced in low-income economies.

The skill sets, industrial structures and institutions underpinning the two models – one of imitation-based development and one of innovation-based development – are fairly different.⁵ The switch between these models tends to occur at middle-income levels and is reflected in a temporary drop in the rate of productivity growth as economies develop new skill sets and retool themselves.

This makes the middle-income trap a useful concept, even if it cannot be pinned to a particular level of income that is hard to attain. Rather, it refers to the transformation of a country's economic development model that drives a change in its skill set and economic structures.

Successful middle-income transitions are relatively rare, but they do exist and are more diverse than commonly thought. Comparing economic performance across very different levels of income and several decades is notoriously difficult. In this report, we use a convenient metric that contrasts an economy's performance with that of similar economies, year by year, and calculates the extent to which an economy out-performs its peers over a number of years of sustained strong growth.

The “Asian Tiger” economies have been home to some remarkable transformations. For instance, South Korea outperformed the record of economic growth of its peers by about 850 per cent between 1961 and 2003. Yet, other economies that outperformed expectations by 350 per cent or more in a single episode of strong growth included Botswana, a couple of Caribbean Islands, the Maldives and oil-rich Oman. There is clearly no one recipe for successful middle-income transition in terms of sector focus or industrial policy. The comparative advantages exploited by successful economies varied significantly. What most of them had in common were improvements in governance, education and infrastructure that helped boost investment and productivity in the long term.

There are questions as to how much we can learn from the experience of successful middle-income transitions that have their roots in the early 1960s (as in the case of South Korea, Taipei China or Singapore). To explore the issue in more depth, we looked at the determinants of more recent episodes of sustained strong growth, including the decade since the global financial crisis of 2008-09, and compared them with the determinants of earlier spells of strong growth.

Our analysis reveals that while changes in technology and waves of globalisation affect middle-income transitions, the fundamental factors behind economic successes have remained broadly unchanged. Today, as before, investment and the availability of domestic savings to finance investment are the primary determinants of sustained strong growth, the length of the growth episode, the extent to which an economy can land softly, and its ability to avoid protracted crises and growth reversals. If anything, investment has played a greater role in post-crisis episodes of strong growth than in prior episodes.

While investment remains the key variable, it can and should be channelled to new areas. For instance, changes in technology have made manufacturing production more specialised along the value chain, but have also made knowledge-intensive services more tradeable across borders. And while technologies have evolved, the fundamental recipe for leveraging growth-enhancing investment – governance, skills and infrastructure – has changed little, if at all.

The positive relationship between income per capita and the quality of governance, in particular, is strong. Moreover, as incomes rise, economic development becomes more governance-intensive, as good governance underpins innovation

⁵ See also EBRD (2014) for a discussion with applications for the EBRD regions.

ecosystems. For economies in the EBRD regions, improving governance is a particular challenge: currently, they tend to have lower-quality economic institutions than other emerging markets with similar income levels.

In a globalised world, economies may need to fine-tune their development models more frequently than in the past. As economies develop, the employment share of agriculture declines and the share of services rises. The share of manufacturing rises initially, before reaching a peak and starting to decline. The peak in the manufacturing share of employment occurs at an ever-lower level, however. When economies reach their peak manufacturing employment points, their levels of income per capita, expressed as a percentage of that of the USA, tend to be lower than in the past. This regularity, dubbed “premature deindustrialisation”, is often portrayed as a major headwind to development that may deepen the middle-income trap. However, it may also present an opportunity to invest in new areas, such as knowledge-intensive services, tourism or the green economy,⁶ and leapfrog certain stages of development associated with building large industrial sectors and supporting infrastructure.

“Premature de-industrialisation” does have implications for income distribution in middle-income economies, though. Although manufacturing employment peaks at an ever-lower level of total employment, the manufacturing share of value added in gross domestic product (GDP) tends to decline much more slowly as economies develop further. This is because emerging markets also take advantage of automation to produce goods and services more cost effectively. In developing economies, much as in their advanced counterparts, middle-income occupations that often involve routine or clerical tasks are most vulnerable to automation.

In the past, the rising tide of convergence success tended to lift all boats. Consequently, economies could pursue successful convergence strategies with relatively weak social safety nets (as in the case of China, for instance). Often, social protection would only be strengthened once economies had achieved higher levels of per capita income. Moreover, large corporations would often be major providers of social security. As the sharing/platform economy disrupts traditional corporation-based business models, the approach to social security in middle-income transitions may have to change.

In addition, low- and middle-income economies have tended to enjoy a significant demographic dividend thanks to young and fast-growing labour forces. This is also changing apace.⁷ In emerging Europe, for instance, populations are ageing fast and labour forces are shrinking in many countries. The region’s economies are getting old before they can get rich.

A combination of technological and demographic change requires a rethink of the social safety nets in middle-income economies. The key feature of the new approach is affording protection to individuals rather than jobs – including unemployment benefits, portable pensions and mid-career retraining opportunities. The absence of social safety nets in the face of a rapid “hollowing of the middle” in the jobs market risks feeding populism and short-termism. This could, in turn, undermine economic and political institutions and jeopardise investment – the key drivers of middle-income transitions.

What is often perceived as a conflict between faster growth and social safety nets may, however, be a trade-off only in the short run. In the longer run, without broader societal consensus, growth-promoting economic policies may prove impossible to sustain in the face of brisk technological and demographic change.

Some policies can boost growth prospects while also strengthening equality of opportunity in an economy. For instance, improving infrastructure connections to relatively disadvantaged regions boosts trade, both domestic and international. A study of large-scale coordinated upgrades to Turkey’s road infrastructure in 2006-15, for example, found that better transport infrastructure had considerable effects on domestic trade. Moreover, as better roads improve economic opportunities in poorly connected regions, employment increases and outward migration declines, contrary to the belief that better transport links might facilitate an exodus from less developed regions.

Municipal infrastructure is another example of ultra-long-term investment that can boost growth and equality of opportunity. It helps to create a clustering effect, the agglomeration of people and ideas needed to boost productivity growth in many sectors of an economy. It also shapes a country’s environmental footprint and people’s livelihoods for centuries to come.

The change in economic model at the heart of middle-income transitions is also reflected in the way that firms enter the market, grow and cease to exist. In general, firms in middle-income

⁶ See Fankhauser and Kotsch (2018) and Martin (2019) for a discussion of green-economy potential in the EBRD region.

⁷ See EBRD (2018).



“

A combination of technological and demographic change requires a rethink of the social safety nets in middle-income economies

economies tend to be less productive than firms in advanced economies. This is unsurprising, as differences in productivity of individual enterprises lead to differences in per capita income. Economic convergence is essentially about boosting the productivity of firms.

As countries develop, large enterprises, sometimes referred to as “national champions”, may deliver fast growth and improvements in productivity.⁸ These enterprises often excel at importing existing technologies, leveraging economies of scale and penetrating export markets – with or without the support of the state. Yet, they seldom excel in innovation on a global scale.

As growth becomes more innovation-intensive, the healthy ecosystem of small and medium-sized enterprises (SMEs) plays an increasingly important role in supporting economy-wide productivity growth. The success of SMEs is also key to broadening the distribution of wealth generated by economic convergence, thus helping to avoid an excessive rise in income inequality.

Small is not necessarily beautiful in middle-income economies, however. On average, small firms tend to be less productive than large firms. This is to be expected: very productive small firms should be able to grow fast, gain market share and become large, contributing to the productivity growth of the economy overall. However, small firms in middle-income economies are often particularly unproductive. Small firms in emerging Europe, for instance, tend to be far less productive than their counterparts in advanced economies, such as Germany. The difference between the productivity of large firms in the EBRD regions and large German firms is far smaller. There also appears to be a tenuous link between the productivity of small firms in emerging Europe and their likelihood of growing or shrinking.

Regulations and poor governance often create perverse incentives for firms to stay small. Sometimes this is because larger firms are subject to much more onerous regulation in an attempt to protect jobs and create employer-based social-security nets. In other cases, rent-seeking and predatory behaviour by the authorities can prompt firms to try to remain “under the radar”. Whatever the cause, completing the middle-income transition is reliant on institutional improvements that can strengthen dynamism among small and medium-sized companies.

Another major challenge faced by middle-income economies is rising pollution. As economies develop, they tend to industrialise before they can strengthen their comparative advantage in low-

pollution sectors, such as knowledge-intensive services. The result is the environmental “Kuznets curve”, whereby middle-income economies become more polluting per unit of GDP than both low-income and high-income countries. Just as they need to give SMEs a leg up, countries need to create the right incentives for firms to pursue energy savings and make growth greener.

Studies find that markets are good at responding to incentives, but firms, somewhat cynically, will respond to both incentives to modernise their production and incentives to remain backward. In countries where energy consumption is strongly subsidised, better-managed firms are significantly less energy efficient. They emit more greenhouse gases per unit of sales as good managers seek to exploit energy subsidies provided by the government. In countries with few or no energy subsidies, better-managed firms are up to 30 per cent more energy efficient than their poorly managed counterparts.

Many problems can be solved by throwing enough money at them, but evidence suggests that in the case of middle-income transitions, the structure (or quality) of finance is particularly important. In the early stages of development, finance is a critical ingredient of growth. It helps entrepreneurs bring their ideas to market and speeds up the accumulation of physical and human capital.

In recent years, there has been growing concern about over-indebtedness in middle-income economies. Corporate debt in large emerging markets as a percentage of GDP now exceeds that of companies in advanced economies. Further analysis shows that higher private-sector credit as a percentage of GDP can lower the likelihood of exceptionally strong growth and make poor performance more likely. This relationship actually predates the global financial crisis.

The depth of equity markets exhibits a strong positive correlation with robust growth. It is also associated with lower greenhouse gas emissions across industries and countries, while higher levels of debt finance lead to rising emissions. In part, this is due to the propensity of banks to invest in older, tested technologies. Equity, in contrast, is more likely to plump for innovative, forward-looking ideas, both through stock markets and specialised instruments, such as private equity or venture-capital funds.

The provision of longer-term finance and finance in local currency further reduces the vulnerability of middle-income

⁸ See Chang (2011) for a discussion and examples from various countries.

economies to external shocks. In countries where non-performing loan levels are high, swift resolution can pay a substantial growth dividend. Overall, middle-income economies are less dependent on the availability of finance than commonly thought, but the structure of finance plays a key role in shaping their growth trajectories.

In sum, middle-income transitions are challenging. At this stage in their economic development, countries need to rethink their economic model. Economies need to maintain investment in existing capabilities while simultaneously investing in new ones. Notwithstanding these challenges, several countries – notably South Korea – have succeeded in rapidly transitioning from low to relatively high levels of per capita income.

Over time, technology has altered some of the ingredients of such success. Today, for example, knowledge-intensive services can be exported in much the same way as manufactured products, while manufacturing employs fewer workers than it did a few decades ago. Building social safety nets and making economic growth greener have become increasingly important elements of middle-income transitions.

Yet, other ingredients of successful middle-income transitions have grown in importance, too. Investment, for instance, remains the single most important determinant of exceptional growth performance over the long term. High investment, in turn, relies on good governance and quality skills. And when it comes to financing sustained growth in middle-income economies, the way in which finance is structured matters.

BOX 1. Eight facts about middle-income transitions

- 1.** The “middle-income trap” is about rethinking a country’s economic development model rather than overcoming a particular level of income.
- 2.** Successful middle-income transitions, such as South Korea’s, are relatively rare, but they are far more geographically diverse than commonly thought.
- 3.** The factors behind “growth miracles” change over time, but not always in the way they conform to stereotypes. Investment remains the key ingredient, even if technology changes its focus. In turn, productive investment requires good governance, strong skills and quality infrastructure.
- 4.** In the past, middle-income transitions were possible without due attention to building social safety nets. In the future, this will change.
- 5.** Beyond boosting growth, investment in infrastructure helps to improve equality of opportunity.
- 6.** Predictably, firms in middle-income economies are less productive than their advanced-economy counterparts. However, the relative productivity gap is greater for small firms than for large enterprises.
- 7.** Middle-income economies are high polluters, a reflection of the distorted incentives firms often face.
- 8.** Finance matters to middle-income transitions – particularly the way, in which it is structured.

1 ECONOMIC REINVENTION



The “middle-income trap” is about rethinking a country’s economic development model rather than overcoming a particular level of income. The term was originally coined to describe the experience of Asian economies after the region’s financial crisis of 1997-98: countries that had seen strong rates of growth saw a slow-down once they achieved middle-income status. The concept has since become widespread, yet numerous studies have largely failed to identify a threshold at which growth rates drop sharply. What’s more, growth in total factor productivity – the efficiency with which various factors of production are combined – tends to be lower at middle-income levels as economies retool their development models and invest in old and new production capabilities. The new economic model underpinning the transition to high-income status emphasises innovation, entrepreneurship, competition and specialised skills.

➤

THE SLOW-DOWN IN TOTAL FACTOR PRODUCTIVITY GROWTH IS PARTICULARLY PRONOUNCED IN COUNTRIES WHERE GDP PER CAPITA IS AROUND

ONE-THIRD TO THREE-QUARTERS

THAT OF THE USA



The term middle-income trap was originally coined to describe the experience of Asian economies after the region's financial crisis of 1997-98: countries that had experienced strong rates of growth saw a slow-down once they achieved middle-income status. Over time, a broader question arose: do middle-income countries find it particularly hard to sustain high rates of economic growth?

NO TRAP AT A PARTICULAR LEVEL OF INCOME

Numerous studies into the “middle-income trap” have looked for a sharp slow-down in growth at a specific level of income but have by and large failed to identify any such threshold. To see why, consider, for instance, average growth in gross domestic product (GDP) per capita in 1998-2017 plotted against the initial level of GDP per capita in 1998 (see Chart 1.1).

Long-term growth performance follows the law of diminishing returns. As income rises, economic growth tends to slow – a conjecture that is central to modern growth theories. This trend holds when we take into account a country's initial capital stock, its initial human capital and a number of other variables that can be expected to affect economic performance. It remains broadly similar if we look at long-term growth over different periods of time. The only exception concerns the poorest economies, which have, on average, experienced slower growth than the law of diminishing returns would suggest.

MIDDLE-INCOME PRODUCTIVITY TRAP?

The picture becomes more nuanced if we look at the composition of growth. In a simple framework, changes in output can be attributed to increases in employment, rising capital stock, improvements in human capital or the residual component. This residual component refers to change in total factor productivity (TFP) – the efficiency with which other factors of production are combined to deliver final output. Sources of growth have varied across emerging markets since 1998 (see Chart 1.2).

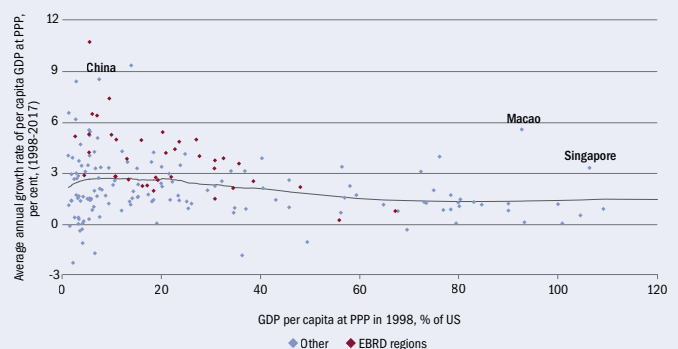
On balance, middle-income economies have found boosting total factor productivity to be particularly challenging (see Chart 1.3), not least because a similar law of diminishing returns is at play. As economies grow richer and adopt more advanced technologies, total factor productivity growth tends to slow. However, this slow-down is particularly pronounced in countries where GDP per capita is around one- to two-thirds that of the USA. Advanced economies have enjoyed stronger productivity growth, on average, since 1998 than middle-income economies. In the EBRD regions, TFP growth was stronger than that of other economies with similar levels of income before the global financial crisis, but has slowed markedly since.¹

SHIFTING ECONOMIC MODEL: FROM IMITATION TO INNOVATION

This “productivity trap” may reflect the changing nature of the elements needed to boost total factor productivity as countries grow richer, in line with the neo-Schumpeterian framework.² Low-income economies tend to use less advanced technologies,³ so remain far from the “technological frontier”. These economies are able to improve productivity rapidly by importing and imitating technology developed in more advanced economies. As countries benefit from the transfer of knowledge and move towards the “technological frontier”, they grow richer. Their labour costs rise, undermining their advantage as providers of cheap labour using imported technologies.

To counteract the resulting loss of competitiveness, middle-income economies need to increasingly *develop* new technologies. They may, in turn, become exporters of technology and knowledge to lower-income countries, in what is known as the “flying geese” paradigm of development.⁴

CHART 1.1. Initial GDP per capita and average annual growth in GDP per capita: the law of diminishing returns



Source: International Monetary Fund (IMF), World Bank and authors' calculations.
Note: The trend line is based on a loess non-parametric estimation.



¹ See EBRD (2017).

² See Acemoglu et al. (2006).

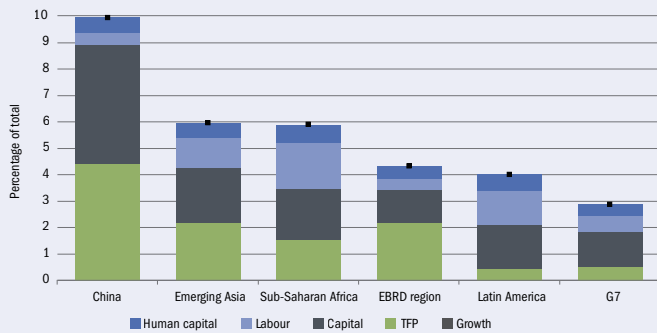
³ See Baldwin (2016).

⁴ See Akamatsu (1962).

As countries shift from imitation to innovation, their reform priorities and growth models need to change. This transition presents distinct challenges. It often requires changes to skills sets and industrial structures, with a greater role for entrepreneurship and competition. It also requires changes to the structure of finance, as specialised finance and equity start to play a greater role. Producing textiles more and more efficiently, for example, may require maximising economies of scale. This does not necessarily equip a country to design *haute couture* garments and outsource their production to lower-income economies. Likewise, manufacturing cheaper and cheaper computer chips does not automatically turn an economy into a leader in hardware design and software development. This switch is at the heart of the middle-income challenge and the “productivity trap”. It may occur as much within industries as between sectors.

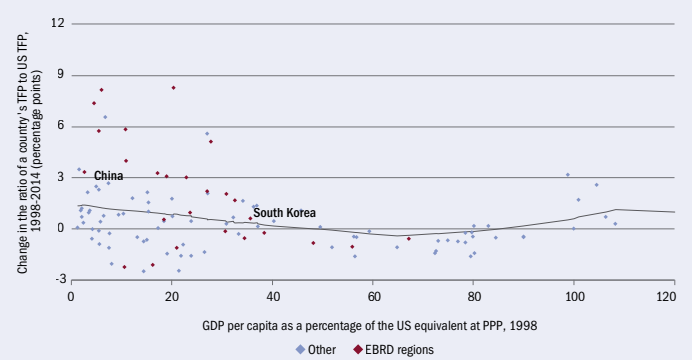
**ADVANCED ECONOMIES
HAVE ENJOYED STRONGER
PRODUCTIVITY GROWTH,
ON AVERAGE, SINCE
1998
THAN MIDDLE-INCOME
ECONOMIES**

CHART 1.2. Sources of growth have varied across economies and regions



Source: Penn World Tables, IMF, World Bank and authors' calculations.
Note: Simple averages across countries from 1998 to 2014. Estimates for Latin America and sub-Saharan Africa are based on six large representative economies in each case. G7 economies comprise Canada, France, Germany, Italy, Japan, the United Kingdom and the USA

CHART 1.3. Total factor productivity growth follows a U-shaped pattern as income per capita rises



Source: Penn World Tables, IMF, World Bank and authors' calculations.
Note: Trend lines are based on lowest non-parametric estimation.

**AS COUNTRIES SHIFT FROM
IMITATION TO INNOVATION,
THE REFORM PRIORITIES
AND GROWTH MODELS
NEED TO CHANGE**





**THE ASIAN FINANCIAL
CRISIS EXPOSED THE
CRACKS IN THE CHAEBOL
MODEL AND PROVIDED A
WINDOW OF OPPORTUNITY
FOR REFORM**

**INNOVATION REQUIRES LOWERING BARRIERS TO ENTRY:
EVIDENCE FROM SOUTH KOREA**

In contrast, innovation often requires a vibrant ecosystem of entrepreneurs and small firms that are prepared to try out new ideas and succeed or fail, something that middle-income economies often need to develop almost from scratch.

South Korea's experience illustrates the challenges of fine-tuning an economic model in an economy with large incumbent firms. The country's chaebol firms – large corporate conglomerates – have been instrumental in building South Korea's export industries in electronics, automotive and other sectors. At the same time, closely knit networks of chaebols with intertwined ownership links have effectively restricted the entry of competitors into their product markets. The track record of the chaebols in terms of frontier innovation, meanwhile, has been relatively modest.

The Asian financial crisis exposed the cracks in the chaebol model and provided a window of opportunity for reform, including the restructuring of under-performing chaebols, the removal of certain barriers to entry and the phasing out of implicit state financial support for the industrial conglomerates. These reforms helped South Korea to transition to a more innovation-intensive business model.

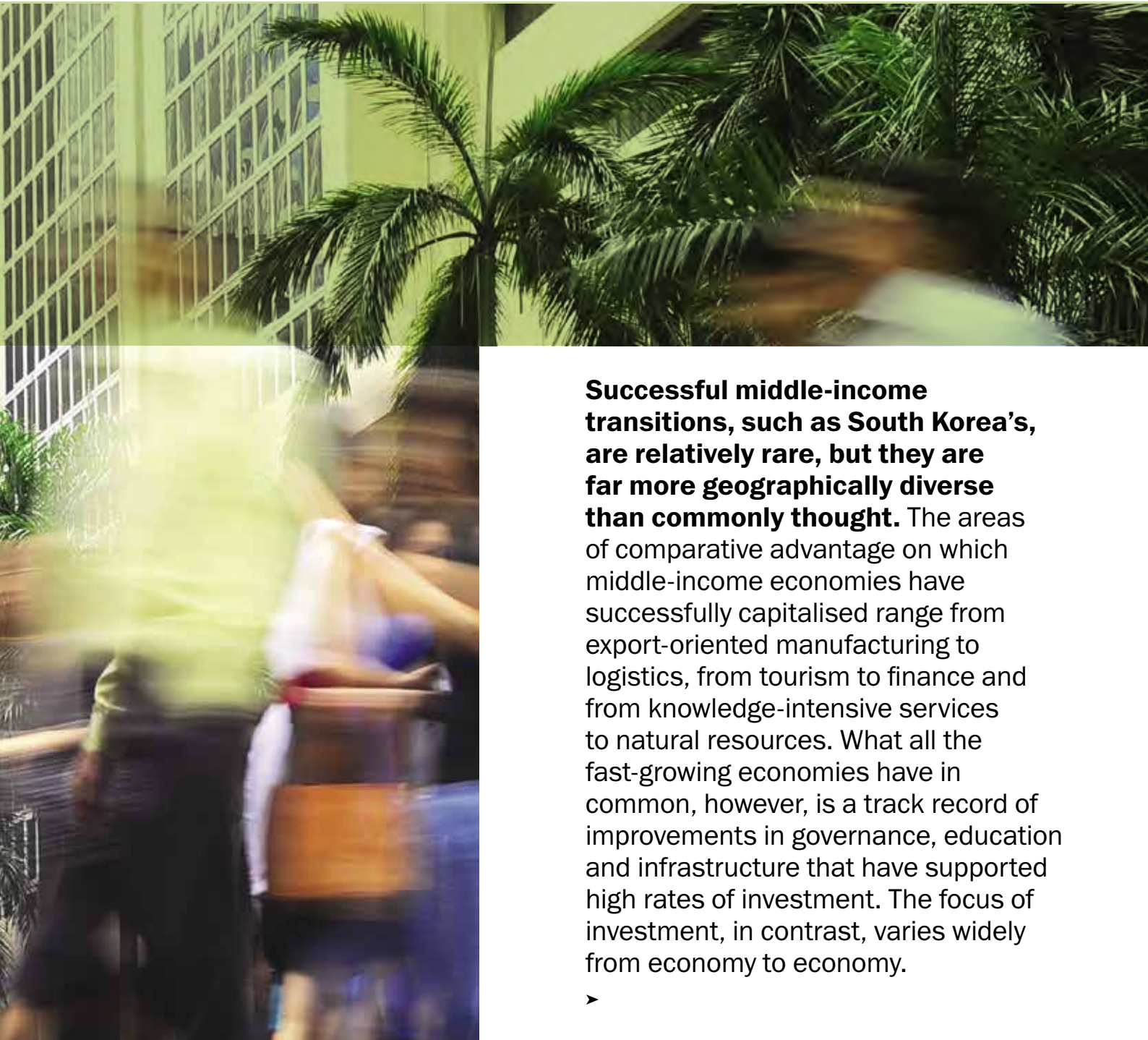
A recent firm-level study of the performance of South Korea's firms⁸ showed that industries dominated by the chaebols prior to the 1998 Asian financial crisis saw greater relative productivity gains after the crisis, when barriers to market entry by smaller firms were lowered (see Chart 1.5). The improvements in labour productivity and total factor productivity were particularly large for non-chaebol firms operating in sectors previously dominated by the chaebols.

In sum, the “middle-income trap” may not exist at a specific level of income. Still, it is a useful concept for focusing policymakers' attention on required changes in the economic development model when economies reach middle-income status and workers are enjoying higher wages.

⁸ See Aghion et al. (forthcoming).

2 PAST SUCCESSES





Successful middle-income transitions, such as South Korea's, are relatively rare, but they are far more geographically diverse than commonly thought. The areas of comparative advantage on which middle-income economies have successfully capitalised range from export-oriented manufacturing to logistics, from tourism to finance and from knowledge-intensive services to natural resources. What all the fast-growing economies have in common, however, is a track record of improvements in governance, education and infrastructure that have supported high rates of investment. The focus of investment, in contrast, varies widely from economy to economy.



OVER THE VERY LONG TERM, ONLY

23

ECONOMIES HAVE MANAGED TO OUTPERFORM THEIR PEERS, ON AVERAGE, BY AT LEAST ONE PERCENTAGE POINT PER ANNUM IN TERMS OF REAL OUTPUT AND REAL OUTPUT PER CAPITA

AZERBAIJAN HAS INCREASED ITS INCOME PER CAPITA AT PURCHASING POWER PARITY FROM

9%

OF THE US LEVEL IN THE MID-1990S TO AROUND ONE-THIRD OF THE US LEVEL TODAY

COUNTRIES' FORTUNES CAN DIVERGE RAPIDLY

Economies that sustain high rates of income growth over prolonged periods are few and far between. Consequently, rapid transitions from low levels of income per capita to middle and high levels of income per capita are rare. Some oft-quoted examples of successful middle-income transitions have been extensively studied. Singapore, for instance, had GDP per capita similar to that of Brazil and the Democratic Republic of the Congo in the 1960s, however, the three countries' income trajectories have diverged remarkably (see Chart 2.1). South Korea's transition is another noteworthy example, as we discuss in Box 2.2.

SUCCESSFUL MIDDLE-INCOME TRANSITIONS ARE RARE

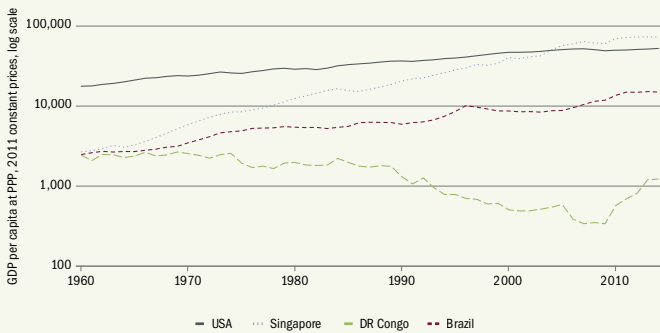
Are successful middle-income transitions actually that rare, though? And are the performances of South Korea and Singapore really unique? To answer these questions, we need to compare the performance of economies across continents and over time, and under very different circumstances. One way to run such a comparison is to estimate a counterfactual rate of economic growth for every economy each year. This counterfactual

performance can be defined as a weighted average of growth rates of economies with similar levels of GDP per capita, taking into account the population size of comparator economies.¹

We can define the *relative performance* of an economy in a given year as the deviation of an economy's real output from the level that could be achieved by a "synthetic" comparator economy (that is, the weighted average of all similar economies). To calculate an economy's compound performance over several years, we can multiply its deviations from the growth rate achieved by its synthetic comparator in each year. For instance, if an economy achieved a relative performance of 2 per cent for eight years running, cumulatively, it would have out-performed its synthetic comparator by around 17 per cent. The analysis focuses on the long-term performance, going back as far as reliable GDP figures are available.

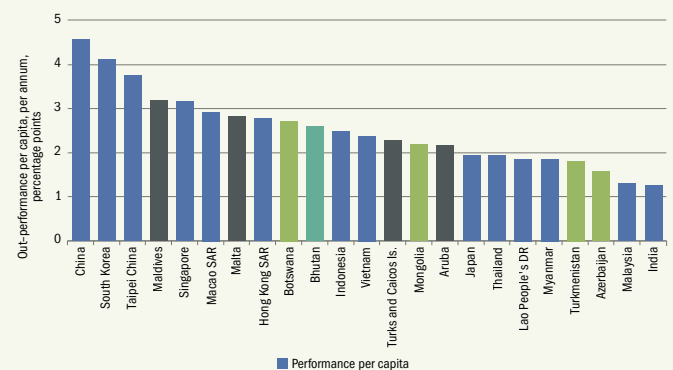
Over the long term (20 to 60 years), only 23 economies have managed to out-perform their peers by at least 1 percentage point per annum, on average, in terms of both real output and real output per capita (see Chart 2.2). More economies have consistently under-performed their peers by at least 1 percentage point a year in real output growth and per capita

CHART 2.1. Brazil, the Democratic Republic of the Congo and Singapore: strikingly divergent trajectories of income per capita



Source: Lee (2018) based on Penn World Tables 9.0.
Note: GDP per capita is measured in constant international prices at purchasing power parity.

CHART 2.2. Economies that have out-performed by 1 percentage point per annum in output and per capita output terms: geographically diverse



Source: Penn World Tables 9.0, IMF and authors' calculations.
Note: Out-performance is calculated relative to the growth achieved by a synthetic control. Synthetic control groups are based on GDP per capita and population and are updated each year. Different colours denote South-East Asian/East Asian economies, commodity-rich economies, small island economies and other economies. Countries with fewer than 20 years of data are not shown.



ARE SUCCESSFUL MIDDLE-INCOME TRANSITIONS ACTUALLY THAT RARE AND ARE THE PERFORMANCES OF SOUTH KOREA AND SINGAPORE REALLY UNIQUE?

¹ See Plekhanov and Stostad (2018) for a discussion of the methodology and its application.

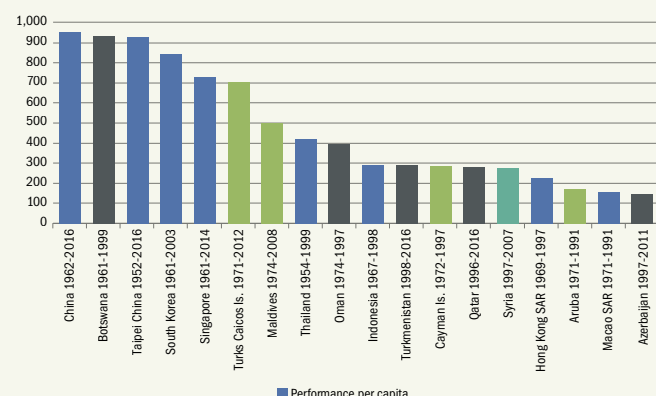
growth terms, with the under-performers more evenly spread across continents than the top performers (see Chart 2.1.1).

Commodity-rich economies feature almost equally among the consistent out-performers and under-performers. A presumption that commodity-rich economies should do better because of their large endowments of natural resources has given rise to the notion of the “resource curse”. The existence of such a curse has been as hotly debated as the “middle-income trap” (see Box 2.1 for a discussion of Russia’s relative performance in recent years).²

GEOGRAPHY OF TOP PERFORMERS IS MORE DIVERSE THAN COMMONLY THOUGHT

Having looked at average long-term performance, we take a closer look at long episodes of strong growth performance. Specifically, we examine spells lasting eight years or more in which an economy out-performed its comparator 90 per cent of the time by at least 1 percentage point a year. In other words, over a 20-year period, an economy must out-perform its generic comparator for at least 18 years and by at least 22 per cent in total.

CHART 2.3. Outstanding episodes of sustained growth out-performance: a wide geographical spread



Source: Plekhanov and Stostad (2018).

Note: Out-performance is calculated relative to the growth achieved by a synthetic control. Synthetic control groups are based on GDP per capita and population and are updated each year. Different colours denote South-East Asian/East Asian economies, commodity-rich economies, small island economies and other economies.

China tops the ranking of outstanding episodes of sustained growth (it has consistently out-performed comparator economies since 1962, by a total of 951 per cent), followed by Botswana (see Chart 2.3). Both countries have yet to join the ranks of high-income economies. South Korea features in the top five largest and longest episodes of exceptionally strong growth (see Box 2.2 for a brief discussion of its experience).

While the so-called Asian Tiger economies, including Singapore and Thailand, occupy many of the top spots when it comes to episodes of strong growth, the 18 economies that out-performed their comparators by 150 per cent or more in a single episode also include countries from Africa, the Caribbean, Central Asia and the Caucasus, the Indian Ocean and the Middle East.

In sum, whether we look at periods of sustained, exceptional growth or average out-performance in the long run, the geographic dispersion of the top performers is broader than commonly perceived. Countries from various continents with vastly different comparative advantages have out-performed expectations by 150 per cent or more by maintaining strong growth over a period of 20 to 40 years. The comparative advantages of these economies are as diverse as their locations. Some (mostly in East Asia and South-East Asia) have established strong export positions in manufacturing, while others have excelled in logistics, finance and knowledge-intensive services. A number of small island economies around the world have positioned themselves as top destinations for tourism or offshore finance, or both. Botswana, Oman and several other countries have succeeded in capitalising on their endowments of natural resources, primarily diamonds and oil.

A SHARED TRACK RECORD OF STRONG GOVERNANCE AND HIGH INVESTMENT LEVELS

For the most part, these economies share a track record of improvements in governance, education and infrastructure that have supported strong investment – although the focus of investment has varied considerably, according to the comparative advantages of the economy in question. The next section takes a systematic look at the determinants of episodes of sustained strong growth.

Although many of the economies featured in Chart 2.3 have exceeded threefold, or even tenfold, all reasonable expectations as to their per capita income growth, most of them have yet to complete their middle-income transitions, largely due to their very low starting levels of per capita income. For instance, Azerbaijan has increased its income per capita at purchasing power parity from around 9 per cent of the US level in the mid-1990s to around one-third of the US level today. For poor economies, the journey of per capita income convergence is necessarily a very long one.



² The term was coined by Auty (1994); see Guriev et al. (2012) for more.

BOX 2.1. Relative economic performance of commodity-rich economies

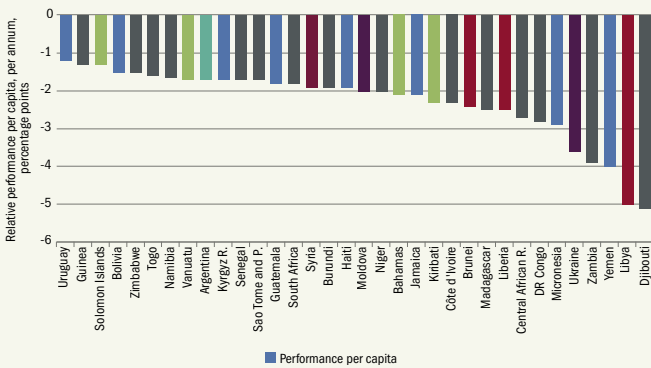
Several episodes of exceptionally strong economic growth have been underpinned by commodity booms (indeed, commodities have played a significant role in five of the top 18 such episodes). On average, however, commodity dependence is not strongly associated with either a higher or lower probability of consistently outpacing one's peers. In part, this is down to the high volatility of commodity prices. It is also due to economies' varying ability to capitalise on their commodity fortunes: while diamond-rich Botswana is among the top performers over the long term, for example, diamond-rich but conflict-torn Liberia is one of the worst under-performers (see Chart 2.1.1). Both the lists of top performers and under-performers feature several major oil exporters.

The synthetic comparator method can be extended to assess the economic performance of a given commodity-rich economy (one where exports of commodities average at least 60 per cent

of total exports) against the synthetic performance of similarly commodity-rich economies.

For instance, Russia, one of the world's top three oil exporters, posted a weaker performance than economies with similar GDP per capita from 2009 to 2016, but was broadly in line with comparable commodity exporters (see Chart 2.2.2) – perhaps with the exception of 2009, when its economy was hit particularly hard. Earlier in the 2000s, Russia's economy out-performed both its commodity-rich peers and commodity-poor ones. During that period, like many other countries in emerging Europe, Russia enjoyed improvements in total factor productivity, as it began to better utilise the wealth of physical and human capital it had inherited from central planning. This TFP convergence boosted economic growth beyond levels that oil prices, alone, would have predicted.

CHART 2.1.1. Many of the economies that have under-performed by 1 percentage point per annum in terms of output and per capita output are commodity rich



Source: Penn World Tables 9.0, IMF and authors' calculations.
 Note: Out-performance is calculated relative to the growth achieved by a synthetic control. Synthetic control groups are based on GDP per capita and population and are updated each year. Different colours denote economies in Latin America and the Caribbean, African economies, small island economies, commodity-rich economies, economies in the Middle East and other economies. Countries with fewer than 20 years of data are not shown.

CHART 2.1.2. Russia has out-performed similar commodity-rich economies



Source: Penn World Tables, IMF and authors' calculations.
 Note: Comparators are limited to the economies where commodity exports average at least 60 per cent of total exports.

CHINA HAS CONSISTENTLY OUT-PERFORMED COMPARATOR ECONOMIES SINCE 1962, BY A TOTAL OF

951%



BOX 2.2. South Korea's performance

South Korea boasts one of the longest and strongest episodes of sustained growth out-performance in post-war history.³ The country's period of robust growth started in the early 1960s and, by the mid-2000s, its output was around 9.5 times the level suggested by the growth trajectories of its peers. In recent years, South Korea's economic performance has remained strong, even though the economy does not routinely out-perform its comparators as before.

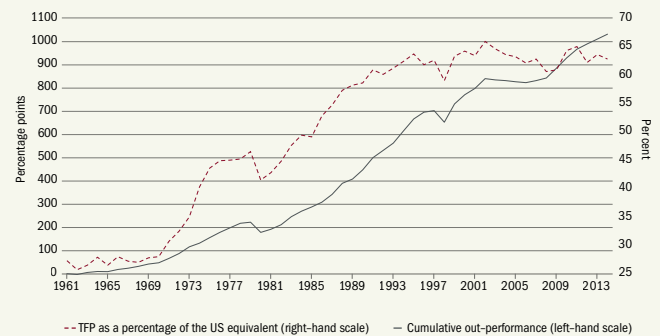
The first striking feature of South Korea's middle-income transition is its balanced growth trajectory. All factors – capital, labour, human capital and total factor productivity – have contributed strongly to the country's out-performance. The progress made in terms of human capital (measured by years of schooling) has been particularly impressive from an international perspective. During the country's early years of out-performance, TFP increased rapidly, facilitating the effective absorption of capital in the economy in later years (see Chart 2.2.1).

Investment in physical capital remained high throughout the episode – unlike in Japan, for instance, where it declined sharply. Investment was largely financed using domestic savings. Foreign direct investment (FDI) also played a role, but was, if anything, somewhat weaker than one might have expected. South Korea also invested heavily in infrastructure and has remained a global leader in terms of its average broadband connection speed.

Sectoral shifts in labour and capital – notably away from agriculture – also played an important role. Productivity improvements at sectoral level were something of a mixed bag, with productivity in the service sector rising only slowly. In the early 1960s, manufacturing exports were well below average for a country at South Korea's level of development, but they went on to make a significant contribution to growth.

South Korea's exports target a specific niche – the lower end of several high-tech sectors (such as computers, electronics and cars) – with relatively low unit values and high export volumes. Despite targeting the lower-unit-value segment of the market, South Korea had to make a gradual transition from the imitation and import of

CHART 2.2.1. Cumulative out-performance and total factor productivity growth went hand in hand in South Korea



Source: Penn World Tables, IMF and authors' calculations.

technology to innovation and the exporting of technology, facilitated by rapid increases in human capital.

South Korea's economy has not been immune to crises and was hit particularly hard in 1971, 1980, 1991 and 2008. On each occasion it recovered swiftly and, unlike most crisis-hit economies, maintained its high investment levels.⁴ Today, South Korea's GDP per capita is around half that of the USA at market exchange rates and two-thirds that of the USA at purchasing power parity, with income convergence continuing.

SOUTH KOREA BOASTS ONE OF THE LONGEST AND STRONGEST EPISODES OF SUSTAINED GROWTH OUT-PERFORMANCE IN POST-WAR HISTORY.



³ This discussion of developments in South Korea is borrowed from EBRD (2017) and draws heavily on Lee (2016) and Eichengreen et al. (2012).

⁴ See Hong and Tornell (2005).

3

INVESTMENT AND GOVERNANCE





Factors behind “growth miracles” change over time – but not always in ways that conform to stereotypes. Investment remains the key ingredient, even if technology changes its focus. In turn, productive investment requires good governance, strong skills and quality infrastructure.

Fundamentals such as investment, domestic savings and improvements in economic institutions have mattered more, not less, to sustained strong growth over the past decade. In contrast, debt finance has been negatively associated with sustained strong growth performance, even prior to the global financial crisis of 2008-09.



IN THE UK,
MANUFACTURING
EMPLOYMENT
PEAKED AT ABOUT

50%

OF TOTAL EMPLOYMENT
IN 1900 OR SO

IN BRAZIL, PEAK
MANUFACTURING
EMPLOYMENT
OCCURRED AROUND

25%

OF TOTAL EMPLOYMENT
IN THE 1980S



DEVELOPMENT MODELS HAVE EVOLVED WITH TECHNOLOGY

All of the top 10 episodes of sustained strong growth identified in the previous analysis started before 1975; the top five started in or before 1961. Likewise, much of the cross-country analysis of growth episodes is based on data from the 1960s, 1970s and 1980s.¹ Questions are often asked as to whether the lessons of these past episodes of growth still apply today.

Globalisation and technological change have undoubtedly had an impact on development models. The world economy has become more interconnected through global value chains, trade and financial flows. Technological change has rendered certain services increasingly tradeable across borders (such as call centres and consultancy services). The size of the financial sector has grown rapidly across emerging markets and developed countries. These changes have had a profound impact on the patterns of economic convergence.

As economies develop, their share of agricultural employment declines and their share of services employment rises. The pattern of manufacturing employment is more complex: it typically rises rapidly at first, but then peaks and starts to decline. In earlier decades, many economies in Asia were able to develop large, export-oriented manufacturing sectors and integrate them into global value chains by taking advantage of relatively skilled but cheap labour and advances in transportation and telecommunications, which supported the seamless operation of cross-border supply chains.

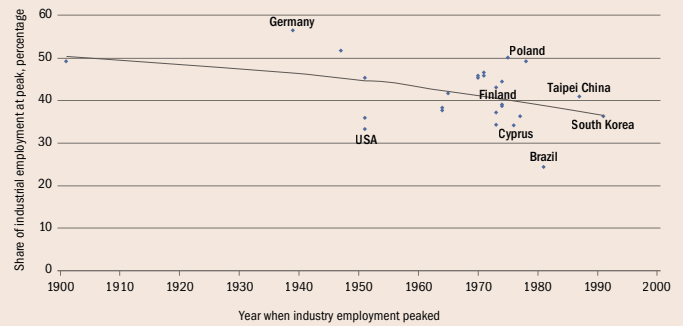
Global industry has become more capital intensive and less labour intensive over time, however, with many tasks previously done by humans now automated. This has limited the potential for industrialisation based on lower wages.² In addition, as incomes have continued to rise worldwide, demand for services has outpaced demand for manufactured goods (at a certain point, people are more likely to spend an additional dollar of income on a meal out or a trip abroad than on an extra pair of shoes).

MANUFACTURING NOW ACCOUNTS FOR A SMALLER SHARE OF THE ECONOMY

As a result, the level at which manufacturing's share of employment peaks in a country's income convergence trajectory has been declining (see Chart 3.1). For instance, in the United Kingdom, manufacturing employment peaked at about 50 per cent of total employment around 1900. In the USA, it peaked around 35 per cent in the 1950s. In Brazil, peak manufacturing employment occurred at about 25 per cent of total employment in the 1980s.

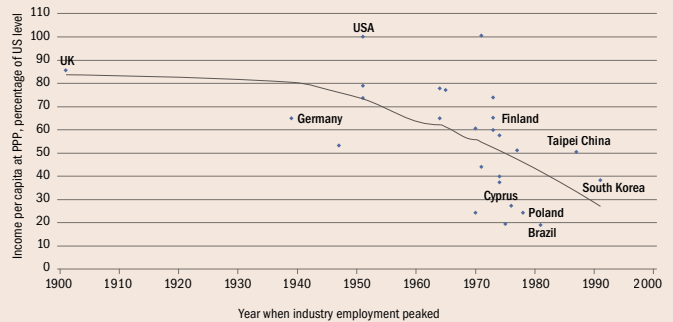
As a consequence, peak manufacturing has been registering earlier in development terms – that is, at increasingly lower levels of income per capita relative to that of the United States of America (see Chart 3.2).³ For instance, Germany and Finland both enjoyed income levels of around 70 per cent of that of the USA at the time their manufacturing peaked as a share of total employment (the ratios of these economies' per capita income to that of the USA remain similar today). In South Korea, peak manufacturing occurred when its income per capita was still less than 40 per cent of the US level. For Poland and Brazil, the corresponding ratio was closer to 20 per cent.

CHART 3.1. Industrial employment as a share of total employment is peaking at ever-lower levels



Source: Sposi et al. (2018).

CHART 3.2. Industrial employment is peaking at ever-lower levels of income per capita, expressed as a percentage of the US level at purchasing power parity



Source: Sposi et al. (2018).

TECHNOLOGICAL CHANGE HAS RENDERED CERTAIN SERVICES INCREASINGLY TRADEABLE ACROSS BORDERS



¹ See, for instance, Lee (2018).

² See World Bank (2017) for a recent discussion of the manufacturing-based development model.

³ See Sposi et al. (2018).

PREMATURE DEINDUSTRIALISATION MAY BE A THREAT OR AN OPPORTUNITY

This regularity, dubbed “premature deindustrialisation”, is often portrayed as a major headwind to economic development.⁴ After manufacturing employment peaks, it may become more difficult to create quality jobs, upgrade skills and contain rising inequalities, as we discuss in subsequent sections of this report.

On the flip side, the declining importance of manufacturing may also present an opportunity to invest in new areas, such as the green economy, knowledge-intensive services, or tourism. Recent studies suggest that, like manufacturing, tradeable services also enjoy faster productivity growth,⁵ owing to the same technological advances in transportation, telecommunications and computing that have made such services more tradeable in the first place. Greater competition in the global market also plays a role. Premature deindustrialisation also presents an opportunity to “leapfrog” certain stages of development that were seen as prerequisites in the past, including investment in costly network infrastructure, such as roads and telecommunication lines.⁶ It further raises the question as to whether the fundamental determinants of exceptional growth performance derived from past experience remain valid today.

CERTAIN FUNDAMENTALS OF STRONG GROWTH PERFORMANCE HAVE EVOLVED

To check whether the fundamental drivers of episodes of strong growth may have changed in recent years, we have looked specifically at the factors supporting such episodes in the decade since the global financial crisis of 2008-09 and compared them with the catalysts for earlier episodes. Our analysis covers multiple aspects: the likelihood of experiencing an episode of strong growth, the likelihood of experiencing an episode of poor growth, the likelihood of an episode coming to an end in a given year and the strength of economic performance once an episode has come to an end. The latter distinguishes between “hard landings”, which can undo some of the gains of earlier boom years, and “soft landings”, where the economy slows, but continues to perform in line with its peers.⁷

Focusing on episodes of strong relative growth performance enables us to identify a meaningful number of episodes of sustained out-performance in the aftermath of the 2008-09 financial crisis, even though economic growth slowed during that period, by about 1.3 percentage points a year, on average, from the pre-crisis years. The results of our empirical analysis are summarised in Table 3.1.

TABLE 3.1. Factors supporting recent growth

Correlations of growth out-performance episodes: a summary view

Factor	Increases likelihood of out-perf.	Reduces chance of under-perf.	More important since 2008		Makes episodes last longer	Helps ensure “soft landing”
			Supporting out-perf.	Preventing under-perf.		
Investment	++	+	+		++	++
Democratic institutions	+	+	-	+?		
Economic institutions	+	++		-?	+?	+
Openness to trade		+				
Openness to finance		+	-	+	-	
Debt finance	--	-				
Equity finance	++	+		+		
Domestic savings	++	++				+
Infrastructure	+	+				

Source: Plekhanov and Stostad (2018).

Note: Based on regression analysis as set out in Plekhanov and Stostad (2018).

⁴ See Rodrik (2016).

⁵ See Mano and Castillo (2015).

⁶ See Brezis et al. (1993).

⁷ See Plekhanov and Stostad (2018) for details

INVESTMENT HAS PLAYED A STRONGER ROLE, IF ANYTHING

Despite lower investment levels and manufacturing's lesser contribution to GDP in recent years, investment has become a stronger, not weaker, predictor of growth out-performance. Higher rates of investment also prolong growth episodes and "soften" the landing once an episode of exceptional growth comes to an end. This is consistent with the "perspiration" view of economic development, whereby investment in physical capital can explain many of the so-called growth miracles (see, for instance, Krugman, 1994, and Young, 1995).

The effect of higher investment rates is further strengthened if investment is financed by higher domestic savings. If domestic savings are low, to boost investment, middle-income economies need to rely on foreign savings and to run persistent and large current-account deficits (the current-account balance being the difference between investment and domestic savings in an economy). This makes economies potentially vulnerable to abrupt changes in the external financing environment and sudden stops in capital flows that finance current-account deficits.

THE ROLE OF GOVERNANCE

Higher-quality economic and political institutions have been associated with greater likelihood and length of sustained growth out-performance, as well as softer landings. The quality of economic institutions in this instance is captured by the Worldwide Governance Indicators (WGIs) of control of corruption, rule of law, regulatory quality and government effectiveness compiled by the World Bank.⁸ The quality of political institutions is measured by the WGIs of voice and accountability, and political stability and absence of violence/terrorism (qualitatively, analysis using Polity variables⁹ produces similar results).

The estimated effects are sizeable. An increase of 1 standard deviation in the quality of economic institutions – say, from the level of Jordan to the level of Estonia – makes an episode of exceptional growth performance 10 to 15 percentage points more likely and an episode of protracted poor growth 20 to 30 percentage points less likely.¹⁰

In recent years, the quality of institutions and, in particular, the quality of political checks and balances appears to have played a greater role in ensuring robust outcomes. It appears to shield economies from the risk of prolonged poor performance, though it also seems to lessen the likelihood of spectacular growth.

Worldwide, there is an observable strong positive relationship between income per capita and the quality of governance (see Chart 3.3). In addition, two stylised facts emerge from the chart. First, high-income economies generally have stronger governance than the linear relationship between the logarithm of per capita income and the quality of institutions would predict. In other words, as income rises, economic development relies ever more on improvements in the quality of governance, with growth becoming more "governance intensive".

GERMAN INCOME WAS AROUND
70%
OF THE US LEVEL WHEN ITS MANUFACTURING PEAKED AS A SHARE OF TOTAL EMPLOYMENT

DEFICIT OF GOVERNANCE IN EBRD REGIONS

Second, economies in the EBRD regions largely have lower-quality institutions than other emerging markets with similar income levels (the corresponding dots on the chart tend to be located below the trend line).¹¹ This governance deficit may become particularly challenging in the later stages of middle-income transition.

It is also in stark contrast to the relatively strong standing of economies in the EBRD regions in terms of skills, also when using the new World Bank data on years of schooling adjusted for quality of tuition (see Chart 3.4). The picture is similar when other measures of student or adult skills are used (see EBRD, 2018).

WEAKER LINK BETWEEN ECONOMIC PERFORMANCE AND ECONOMIC OPENNESS

Another feature of growth episodes since the global financial crisis is a weakening of the link between economic performance and economic openness. In fact, openness to finance, as captured by the Chinn-Ito index of capital-account openness,¹² has had a curtailing effect on episodes of economic out-performance. Here too, however, the picture is more nuanced: much like democratic institutions, greater openness to trade (as measured by the ratios of imports and exports to GDP) and finance have increasingly tended to make episodes of sustained under-performance less likely.

Importantly, these results assume that investment remains unchanged as other determinants of growth performance evolve. In practice, reforms to boost economic openness and the quality of economic and political institutions may have indirect effects on growth out-performance by catalysing investment booms in addition to any direct effects captured in regression analysis.¹³

IN SOUTH KOREA, MANUFACTURING PEAKED WHEN ITS INCOME PER CAPITA WAS STILL LESS THAN

40%
OF THE US LEVEL



⁸ See Kaufmann et al. (2009) for a discussion.

⁹ <http://www.systemicpeace.org/polityproject.html> (last accessed 8 January 2019).

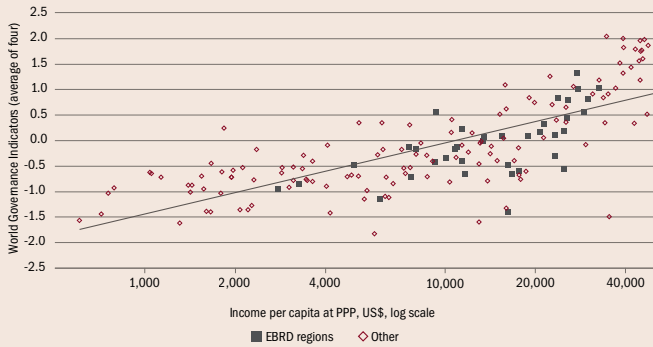
¹⁰ See Plekhanov and Stostad (2018) for estimates and a discussion.

¹¹ See also EBRD (2013).

¹² See Chinn and Ito (2006).

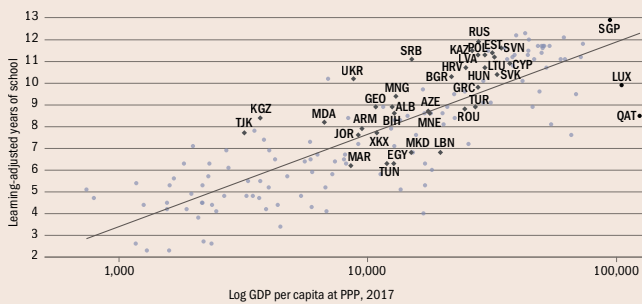
¹³ See Mauro (1995) for an early discussion of the relationship between corruption, investment and growth.

CHART 3.3. Improvements in the quality of governance and economic development go hand in hand, particularly at higher levels of income



Source: World Bank, IMF and authors' calculations.
 Note: The quality of economic institutions is captured by the simple average of the Worldwide Governance Indicators of control of corruption, rule of law, regulatory quality and government effectiveness. Based on 2017 data or the latest observations available.

CHART 3.4. Economies in the EBRD regions tend to perform well in terms of quality-adjusted years of schooling



Source: World Bank, IMF and authors' calculations.

CONCLUSION

Do the findings of long-term studies of growth, largely inspired by the economic fortunes of the 1960s to the 1990s, still apply? Analysis suggests that the determinants of sustained economic out-performance have evolved and that more recent episodes of sustained strong growth have distinctive features – but not always as commonly characterised. The fundamentals that underpinned Asia's economic miracles – such as investment, domestic savings and improvements in the quality of economic institutions – matter more, not less. Higher investment levels, in turn, rely on good governance, supporting infrastructure and improvements in the skills needed to make investments productive.

AVERAGE ECONOMIC GROWTH ACROSS ECONOMIES WORLDWIDE SLOWED BY 1.3 PERCENTAGE POINTS PER ANNUM IN THE YEARS FOLLOWING THE 2008-09 CRISIS



4 SOCIAL SAFETY NETS



In the past, middle-income transition was possible without paying due attention to building social safety nets. In the future, this will change. Technology affects how benefits of convergence are distributed across fast-growing economies. Previously, countries were able to pursue successful income convergence strategies with relatively rudimentary social safety nets, as the rising tide of economic growth lifted all boats. The more recent wave of automation, however, may slow and even reverse the offshoring of jobs from advanced economies and simultaneously hollow out the medium-skilled segments of labour markets. Building social safety nets may be costly, yet the trade-off between faster growth and more comprehensive social safety nets may only be short term. In the longer run, social cohesion is key to making sure that growth-promoting economic policies can be sustained in the face of rapid technological change and demographic shifts.

➤

THE LABOUR SHARE OF INCOME IN THE EBRD REGIONS HAS DECLINED BY AROUND

4
PERCENTAGE POINTS

SINCE THE MID-1990s

IN BULGARIA, ONLY

28%
OF THE POPULATION IS ESTIMATED TO HAVE EXPERIENCED INCOME GROWTH ON A PAR WITH OR ABOVE THE NATIONAL AVERAGE PER CAPITA INCOME GROWTH RATE

Technological change has had a profound impact on the profile of economic convergence. Technology affects not only the rate at which total factor productivity can increase, but also the way in which the benefits of income convergence are distributed across fast-growing economies. In the past, the rising tide of convergence success used to lift all boats. This enabled countries to pursue successful convergence strategies with relatively rudimentary social safety nets and only strengthen social protection when economies achieved higher levels of per capita income (as in the case of many Asian economies, for instance).

This is likely to change as a result of evolving technology and demographic transformation. In the second half of the 20th century, low- and middle-income economies benefited from the rapid rise of global value chains and job creation that was largely concentrated in medium-skilled occupations, both in manufacturing and services (such as finance, insurance and accounting), which accompanied the rise of manufacturing industries.

JOB POLARISATION HAS BEEN RISING IN EMERGING MARKETS

The more recent wave of automation, however, may slow and even reverse the offshoring of jobs from advanced economies and simultaneously hollow out the medium-skilled segments of the labour markets of middle-income economies.¹ Job creation in recent years has been increasingly concentrated in less skilled jobs (such as catering, construction and cleaning) that are harder to automate and in highly skilled jobs (including professional services, and research and development).

In the highly skilled segment, a unit of labour backed by new technologies is often scalable and can be sold an increasingly large number of times (a song or a piece of software can be downloaded millions of times, for instance). At the same time, units of labour in basic occupations that remain hard to automate, such as cleaning or catering, can be sold only once. As a result, technological change is expected to lead to a continued rise in pay inequality.

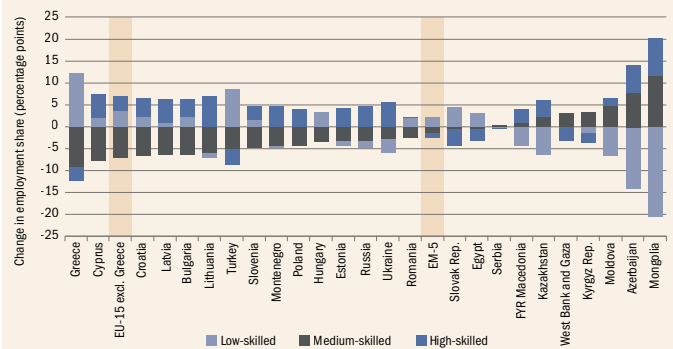
Highly paid skilled jobs, in turn, raise relative demand for personal services, be they cleaning or personal trainer sessions. This further reinforces the polarisation of occupations into what Goos and Manning (2007) called “lovely” and “lousy” jobs.² In addition, in many cases, technological change leads to the de-skilling of occupations long before they disappear. In the past, deskilling affected artisans, such as smiths and tailors, as mechanisation split more complex tasks into a large number of relatively simple ones.³ More recently, navigation systems have deskilled driving, while warehouse automation has deskilled jobs in logistics.

Labour-force surveys point to increasing job polarisation in middle-income economies. In emerging Europe, the share of medium-skilled occupations has been declining, while the shares of low-skilled and high-skilled occupations have been rising. Job polarisation has been increasing, both within sectors and across industries, at a pace similar to that seen

in higher-income European countries (see Chart 4.1).⁴ Recent evidence also points to job polarisation in Egypt, South Africa and other large emerging markets.⁵

The share of national income accruing to workers in the form of wages and salaries (the so-called labour share of income) in emerging Europe, Central Asia and North Africa has declined by around 4 percentage points since the mid-1990s. Other emerging markets have seen similar developments. The decline in the labour share of income exceeded the average decrease in advanced economies over the same period (see Chart 4.2), as in advanced economies, much of the decline in labour share of income happened before the mid-1990s.⁶

CHART 4.1. Medium-skilled occupations as a share of total employment declined from 2006 to 2016



Source: OECD, Eurostat and authors' calculations.

Note: Jobs are classified according to the International Standard Classification of Occupations (ISCO-08). High-skilled occupations include managers, professionals, technicians and associate professionals (groups 1-3). Medium-skilled occupations comprise clerks, craft workers and related trades, plant and machine operators and assemblers (groups 4, 7 and 8). Low-skilled occupations include service and sales workers (group 5) and elementary occupations (group 9). Agriculture and armed forces are excluded (groups 0 and 6). The euro-area average is based on 19 countries. "EM-5" comprises Argentina, Brazil, Malaysia, South Africa and Thailand.

LABOUR-FORCE SURVEYS POINT TO INCREASING JOB POLARISATION IN MIDDLE-INCOME ECONOMIES.

¹ See IDB et al. (2018) for a discussion of the impact on various regions.

² See also Autor and Dorn (2013).

³ See, for instance, Goldin and Katz (1998).

⁴ See also OECD (2017a).

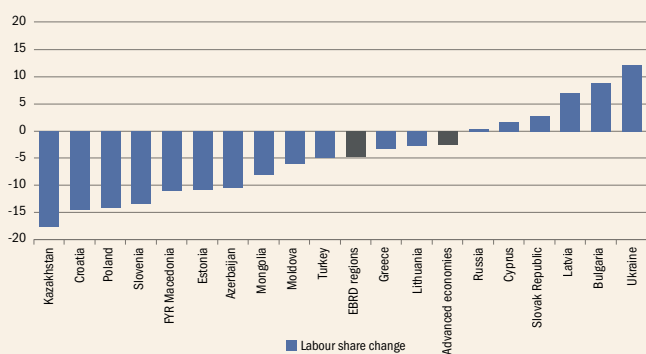
⁵ See Helmy (2015).

⁶ See IMF (2017a).

The recent experience of rising income inequality in the EBRD regions serves as an example of likely future trends across middle-income economies. Countries in the region experienced rapid growth of per capita incomes from the mid-1990s to 2008. However, inequality has also increased rapidly since the start of the transition from central planning to market economy. Estimates in the *Transition Report 2016-17* suggest that in Bulgaria, for instance, only 28 per cent or so of the population saw income growth on a par with or above the average per capita income growth rate of the economy (see Chart 4.3).⁷

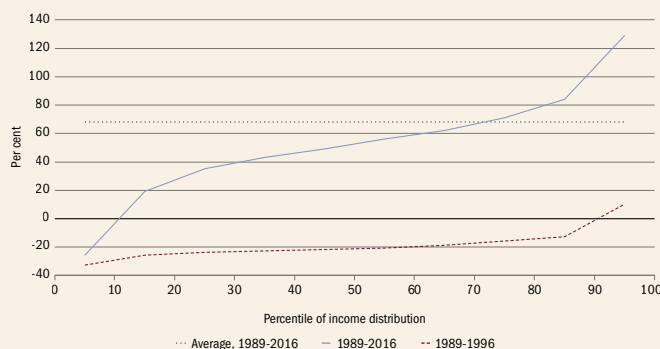
ONLY
44%
OF THE POPULATION
OF EMERGING EUROPE
AND CENTRAL ASIA IS
ESTIMATED TO HAVE SEEN
THEIR PERSONAL INCOME
GROW BY MORE THAN THE
G7 AVERAGE RATE

CHART 4.2. The labour share of income declined in many economies over the period 1994-2017



Source: International Labour Organization (ILO), Karabarounis and Neiman (2014) and authors' calculations.
Note: The ILO data are spliced with data from Karabarounis and Neiman (2014), using the annual rate of change reported in each source.

CHART 4.3. Only around a quarter of Bulgaria's population has seen income growth of more than the national average



Source: National authorities, World Bank Povcal database, IMF 2017b Fiscal Monitor, United Nations (UN) and authors' calculations.



⁷ See EBRD (2016).

Overall, only 44 per cent of the population of emerging Europe and Central Asia is estimated to have personally experienced long-term income convergence – income growth above the average across the G7 economies (Canada, France, Germany, Italy, Japan, the United Kingdom and the USA). In most countries, those who have experienced income convergence tend to be higher up the income ladder today (see Chart 4.4).

The experience of emerging Europe and Central Asia differs from the typical experience of middle-income economies. Here, the distributional impact of technological change has been compounded by the transition from central planning, with a shift from highly compressed wages to wages determined by a competitive job market.

This growing inequality goes some way towards explaining the rise of populist politicians. Even countries with a consistently strong track record of growth, such as Hungary or Poland, have not been immune to populism. If the feedback loop between inequality and politics is ignored, populism and short-termism in economic policy-setting may undermine countries' long-term economic growth and weaken their democratic institutions. This may, in turn, lead to greater short-termism, fuelling a vicious spiral, examples of which can be found in middle-income economies in Latin America, both past and present.

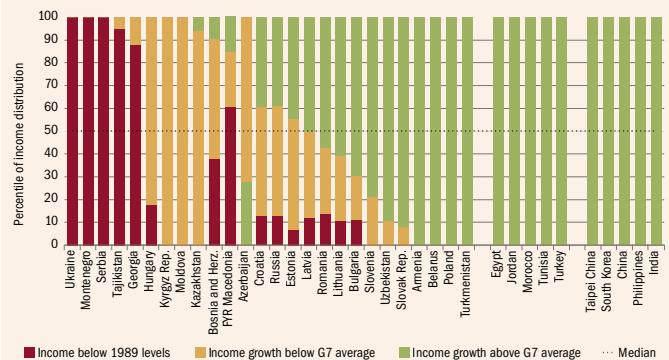
CHANGING DEMOGRAPHICS

Historically, demographic change tended to create strong tailwinds as economies moved towards middle-income status, only to produce equally strong headwinds at later stages of economic development. As low-income economies develop, the birth rate tends to fall and per capita spending on human capital rises. This boosts productivity growth. In addition, the labour force may initially increase as a percentage of the overall population, as the number of children per working-age adult falls. This means that a given rate of productivity growth translates into a higher rate of growth in income per capita.

As economies develop further, however, improvements in the standard of living and better health care translate into higher life expectancy. As a result, populations age and the labour force starts to decline rapidly as a percentage of the total population. Over time, pension obligations necessitate increases in taxation, public debt and/or long-term interest rates. This negatively affects the average rate of growth.

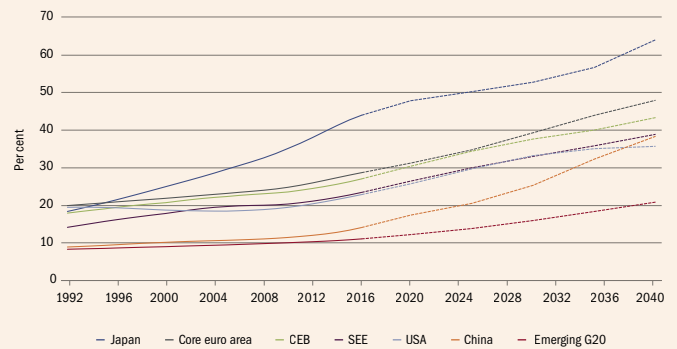
Populations are ageing and birth rates are falling in most emerging markets, but this demographic shift is much further advanced in emerging Europe. The speed of population ageing, as reflected in the rising old-age dependency ratio, is virtually identical to that of advanced European economies. In terms of old-age dependency levels, central Europe and the Baltic states are only about five years behind the eurozone's advanced economies. In China, ageing is expected to accelerate markedly (see Chart 4.5).

CHART 4.4. Less than half the population of emerging Europe and Central Asia experienced personal income convergence between 1989 and 2016



Source: EBRD (2016), based on data from the World Bank Povcal database, the IMF and UN. Note: Data for each percentile are based on linear extrapolation of averages for each decile.

CHART 4.5. Old-age dependency ratio is rapidly rising in middle-income economies



Source: World Bank, UN projections and authors' calculations. Note: The old-age dependency ratio is the share of the population aged 65 and over as a percentage of those aged 15-64. Projections are based on the median scenario. CEB is central Europe and the Baltic states. SEE is south-Eastern Europe.



POPULATIONS ARE AGEING AND BIRTH RATES ARE FALLING IN MOST EMERGING MARKETS, BUT THIS DEMOGRAPHIC SHIFT IS MUCH FURTHER ADVANCED IN EMERGING EUROPE.

GETTING OLD BEFORE GETTING RICH

Over time, the ageing phase tends to start earlier on the economies' development path. In the 1980s and the 1990s, the ratio of people aged 65 and over to working-age adults surpassed 25 per cent when economies (such as Germany, Norway and Sweden) reached per capita incomes of 60 per cent or more of the US level. Today, economies reach the same old-age dependency ratio when their income levels barely exceed 20 to 30 per cent of that of the USA (for instance, Bulgaria, Serbia and Ukraine). This means many middle-income economies may now grow old before they can grow rich. These economies require pension systems that are affordable, yet provide a decent standard of living.

Today's workers in middle-income economies, therefore, need to stay employed for far longer than they did a generation ago. This is challenging, as rapid technological change makes many specialised skills obsolete within a decade or less (recent studies find that around half of acquired skills lose their relevance within five years in the absence of retraining).⁸

LIFELONG LEARNING

As workers need to keep upgrading their skills and acquiring new ones, social safety nets need to adapt. More specifically, they need to facilitate lifelong learning through appropriately structured unemployment insurance and contributions to the cost of retraining. Educational systems need to focus more on helping students to learn how to keep learning throughout their careers, in addition to providing school and university graduates with specific skills.

DEMOGRAPHIC TRANSFORMATIONS AND AUTOMATION

Demographic transformations can accelerate technological change. Between 2017 and 2040, the labour force is projected to grow in only half of the world's economies (based on their contribution to global output today). In the decade prior to the 2008-09 global financial crisis, the labour force was growing in almost every economy. As labour becomes scarcer in middle-income economies, the incentives to automate production grow, as they have in advanced economies.⁹

The new technologies, in turn, are likely to diminish the importance of companies as employers as self-employment takes hold, creating more jobs across the entire skills spectrum, from pizza delivery to private vehicle hire to software development.¹⁰ The rise of the "gig economy" may require a rethink of pension and social-protection provision, as saving for old age has traditionally been viewed as the responsibility of employers.¹¹ While new platforms give workers greater flexibility and foster versatility of skill, in the absence of strong social safety nets, they also create anxiety and can take a toll on individuals' (subjective) wellbeing.

RETHINKING SOCIAL SAFETY NETS

In future, policymakers in the middle-income economies will need to respond to these technological and demographic shifts with reform. Elements of the solution include the full portability of pensions between employers and self-employment, policies to support greater labour-force participation among older workers, and some degree of universal basic income as a means of counteracting the impact of more flexible labour markets and reduced job security on individual income paths.¹² The new schemes also need to prioritise reskilling and upskilling – helping individuals to upgrade and extend their skill sets mid-career.

New technologies can be used to help create additional fiscal space for these policies, for instance, through greater transparency of (cashless) payments,¹³ stronger tax administration and the seamless exchange of information to fight tax evasion.

Building social safety nets may be costly, but any trade-off between faster growth and social safety nets may only be short term. In the longer term, social cohesion is key to making sure that growth-promoting economic policies can be sustained in the face of rapid technological change and demographic transformation.



BETWEEN 2017 AND 2040, THE LABOUR FORCE IS PROJECTED TO GROW ONLY IN

50%

OF THE WORLD'S ECONOMIES.

⁸ See Deloitte (2017).

⁹ McKinsey Global Institute (2017).

¹⁰ Katz and Krueger (2016).

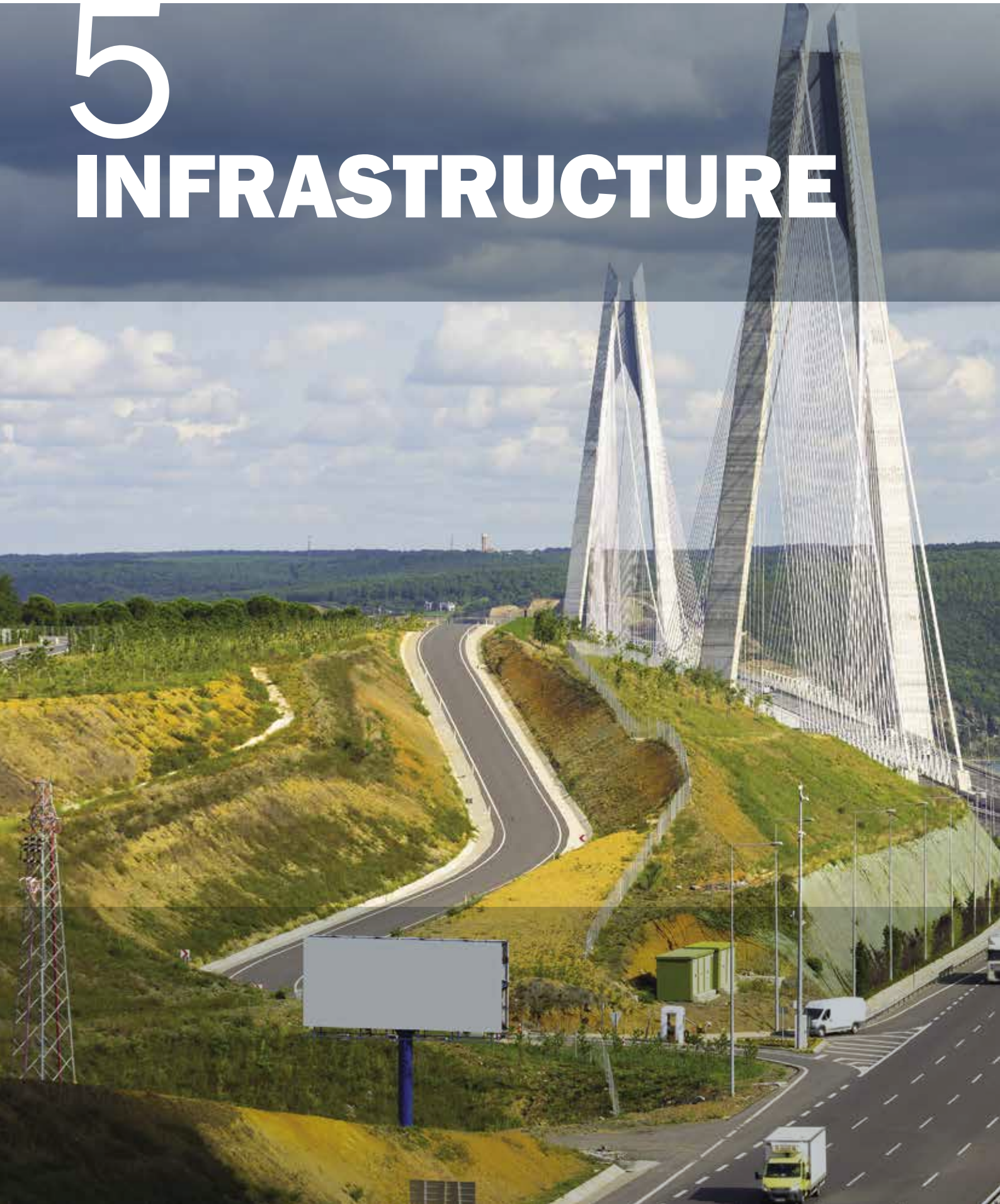
¹¹ Tyson and Mendonca (2015).

¹² See Van Parijs and Vanderborght (2017) and OECD (2017b).

¹³ Rogoff (2016).

5

INFRASTRUCTURE



Beyond boosting growth, investment in infrastructure helps to improve equality of opportunity. Major infrastructure upgrades boost economic activity. Significant coordinated investment in highways across Turkey in the 2000s, for example, led to a major increase in both exports and domestic trade between provinces. Crucially, once more remote and economically disadvantaged regions became better connected to the rest of the country, outward migration from these areas declined and employment increased, as inter-regional infrastructure connections helped to create job opportunities locally.



DUAL CARRIAGEWAYS
AS A SHARE OF
INTER-PROVINCIAL
ROADS IN TURKEY
INCREASED TO
35%
IN 2015 FROM
10 PER CENT IN 2002

TURKEY'S HIGHWAYS
UPGRADE PROGRAMME
COST
1.7%
OF GDP

TURKEY'S ROAD
UPGRADES HAVE
REDUCED THE AVERAGE
TRAVEL TIME BETWEEN
ITS MAIN PROVINCIAL
CITIES TO
5
HOURS FROM
6.5 HOURS



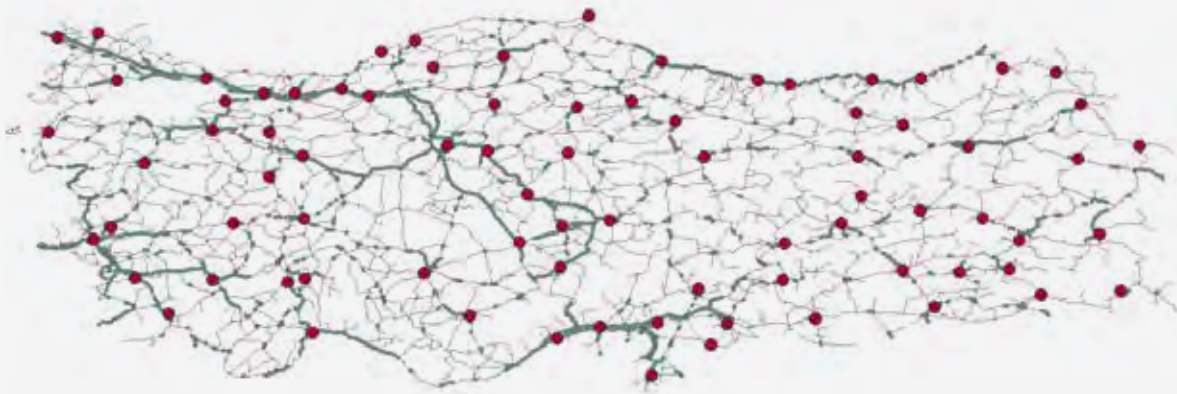
As middle-income economies develop, certain policies can simultaneously boost their growth prospects and strengthen equality of opportunity among their residents. For instance, improving infrastructure connections to relatively disadvantaged regions can boost trade, both domestically (between regions) and internationally.

Transport is the largest beneficiary of infrastructure investment in both middle-income economies and advanced economies.¹ Transport links play a vital role in modern market economies, facilitating domestic and international trade, enabling

the smooth functioning of global value chains and maintaining the economic rhythm of modern cities. A number of studies document the sizeable impact of improvements in transport infrastructure on economic development, spanning various projects in a number of countries, including the introduction of the US interstate highway system and the construction or surfacing of roads in middle-income countries.²

This section illustrates the impact of infrastructure on economic growth and inclusion by drawing on a study of large-scale, coordinated upgrades to Turkey's road infrastructure

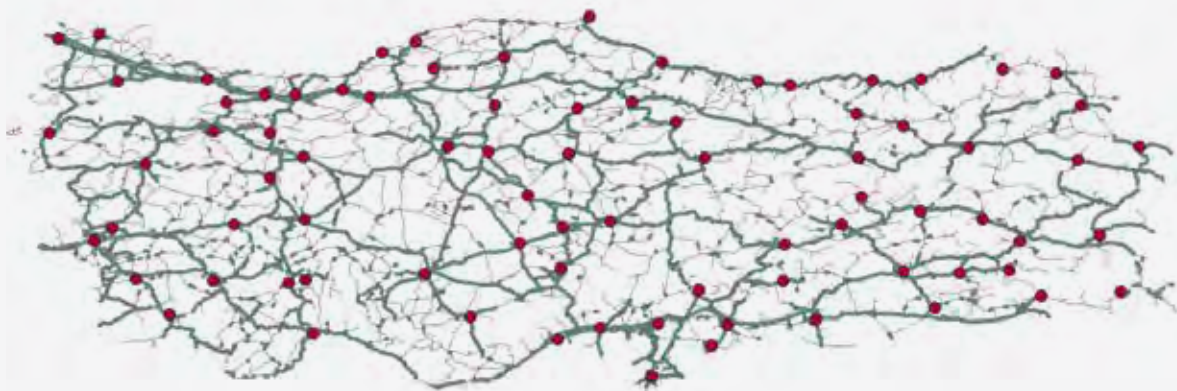
CHART 5.1. Turkey's road network in 2005: extensive, but with few dual carriageways



Source: Turkish General Directorate of Highways (GDH).

Note: Red nodes denote provincial centres, thin lines represent single-carriageway roads and thick lines represent dual-carriageways (highways and expressways).

CHART 5.2. Turkey's road network in 2015: Many more dual carriageways



Source: Turkish General Directorate of Highways (GDH).

Note: Red nodes denote provincial centres, thin lines represent single-carriageway roads, and thick lines represent dual-carriageway roads (highways and expressways).

¹ See EBRD (2017).

² See, for example, Limao and Venables (2001), Duranton et al. (2014), Allen and Arkolakis (2014) and Faber (2014).

undertaken in the 2000s.³ The study finds that the trade effects of infrastructure upgrades can be large. Moreover, as economic opportunities improve in regions that used to be poorly connected, local employment rises and outward migration declines, contrary to the common assumption that better transport links facilitate an exodus from less developed regions.

While Turkey's road infrastructure was substantial prior to these upgrades, the country's road capacity had long been considered inadequate. In 2005, Turkey's 81 provincial centres were connected by an extensive paved road network (see thin lines in Chart 5.1). However, dual carriageways (divided multi-lane highways and expressways) made up only a small percentage of that network (see thick lines in Chart 5.1).

Consequently, the Turkish authorities launched a large-scale public investment programme in 2002 "to ensure the integrity of the national network and address capacity constraints that lead to road traffic accidents".⁴ That investment programme resulted in a significant percentage of existing single carriageways (undivided two-lane roads) being turned into dual carriageways. By 2015, numerous arterial routes had been upgraded (see Chart 5.2) and the share of inter-provincial dual carriageways had risen to 35 per cent from 10 per cent in 2002 (see Chart 5.3).

In this section of the report, we analyse the extent to which this major increase in road capacity has affected Turkey's domestic trade and regional economic outcomes. High transport costs impede market access in isolated regions, both in terms of firms' ability to reach out to potential customers and to buy the production inputs they need. Thus, investment in transport infrastructure can improve growth prospects by facilitating both domestic and international trade. Coşar and Demir (2016), for instance, report that improvements made to Turkey's transport infrastructure in the 2000s significantly enhanced international market access for Turkish regions located a long way from the country's ports.

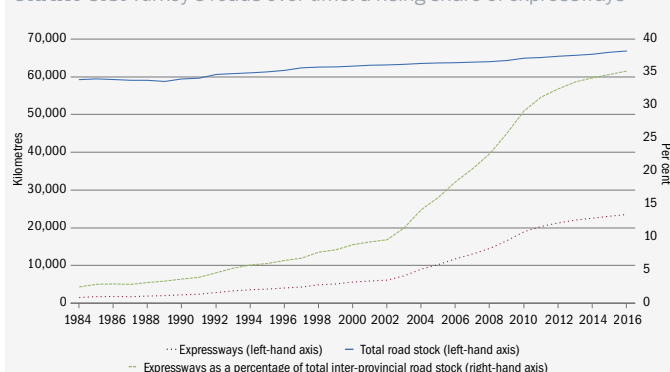
But what were the overall trade gains as a result of the improved roads? To answer this question, we first measure the impact of infrastructure upgrades on travel times between each pair of provinces and then link changes in travel times to changes in regional income levels, employment and migration patterns.

UPGRADES TO THE ROAD NETWORK HAVE GREATLY IMPROVED TRANSPORT OUTCOMES

While dual carriageways account for slightly more than a third of Turkey's total road stock, around 80 per cent of total traffic is estimated to use dual carriageways.⁵ Spending on road upgrades from 2003 to 2010, when the bulk of the investment was undertaken, totalled US\$ 12.7 billion (in constant 2010 prices), or 1.7 per cent of Turkey's 2010 GDP. Following the upgrades, road safety improved greatly, with the number of annual fatalities per kilometre travelled declining by 62 per cent as of 2015.

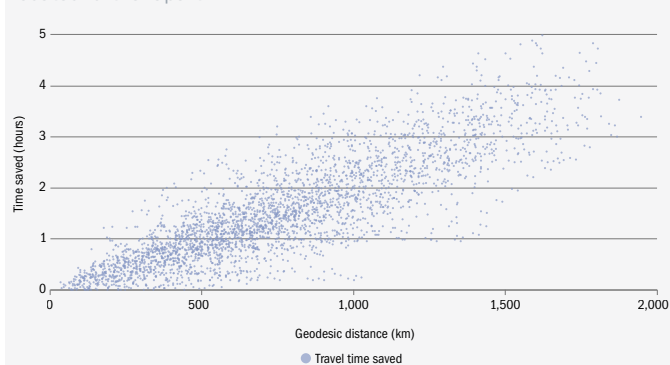
The increase in road capacity has allowed vehicles to travel more consistently at higher speeds, reducing accident rates and making arrival times more predictable. The average travel time between pairs of cities has been reduced by 1.5 hours (see Chart 5.4), from 6.5 hours in 2005 to five hours in 2015.⁶

CHART 5.3. Turkey's roads over time: a rising share of expressways



Source: GDH and authors' calculations.

CHART 5.4. Travel time saved on Turkey's roads is greater for cities located further apart



Source: GDH and authors' calculations.

Note: This chart plots declines in the fastest province-to-province travel times against distances as the crow flies. Each observation represents a pair of provinces.

THANKS TO ROAD UPGRADES IN TURKEY, THE NUMBER OF ANNUAL FATALITIES PER KILOMETRE TRAVELLED HAS DECLINED BY

62%

ON AVERAGE



³ The analysis in this section is based on Coşar et al. (forthcoming).

⁴ See GDH (2014).

⁵ See Grand National Assembly of Turkey (2016).

⁶ See EBRD (2017) for details of these calculations.

The time savings are larger for cities located further apart – as much as five hours in the case of cities separated by a road distance of 1,500 kilometres or more.

TRANSPORT AND DOMESTIC TRADE

In this section, we explore the impact that these time savings have had on trade within Turkey. We use firm-to-firm transaction data provided by the Turkish Ministry of Industry, based on value added tax (VAT) declarations by Turkish firms. Bilateral trade flows between provinces have been constructed by aggregating the data on sales and purchases provided by individual firms.⁷ Information on the road network is taken from the official road maps published by the Turkish General Directorate of Highways for 2005 and 2015. The digitised maps of single and dual carriageways shown in Charts 5.1 and 5.2 have been used to calculate the fastest possible routes between the 81 provincial centres using geographic information system (GIS) software. Data on provincial employment are from the Ministry of Industry, while migration data and information on provincial income per capita are from the Turkish Statistical Institute.

We would expect the reduced travel times resulting from the improvements made to Turkey's transport infrastructure in the decade to 2015 to have increased bilateral domestic trade flows between the Turkish provinces. The impact is estimated using the gravity model of trade, which relates changes in the volume of bilateral trade to changes in the economic size of trading partners and changes in the cost of bilateral trade (see Annex 5.1 for details).

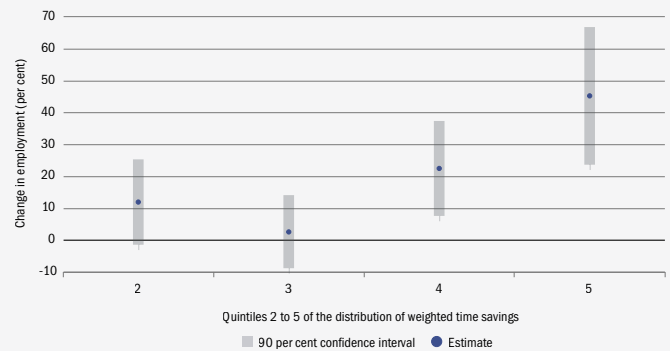
Based on the results in Annex 5.1, a one-hour reduction in travel time between two provincial centres increases bilateral trade between those provinces by about 6 per cent. This effect is highly statistically significant and translates into an increase of US\$ 4.6 million per annum in trade flows for a typical pair of provinces.

This corresponds to a fairly large return on Turkey's investment. To see why, consider a hypothetical route the length of the average distance between the various pairs of cities. Assume that all 755 kilometres of this route was on an undivided single-carriageway road in 2006, resulting in a total travel time of approximately 12 hours. To reduce this travel time by one hour, around 30 per cent of the route (234 kilometres) would need to be transformed into a divided dual carriageway, at an estimated cost of US\$ 26 million per year for 10 years (based on figures reported by the Turkish authorities). The ratio of the increase in annual trade flows to the estimated per annum cost of upgrades is 0.18 implying that US\$ 1 of investment in roads generates an extra US\$ 0.18 in annual domestic trade between a pair of provinces. In addition, road upgrades bring about other benefits, such as increased international trade, fewer traffic-related fatalities and reductions in travel costs.

IMPACT ON INCOME, EMPLOYMENT AND DOMESTIC MIGRATION

We now investigate the impact of the road improvements on provincial income, employment and domestic migration. First, we look at whether provinces in geographical regions that have experienced greater improvements in market access as

CHART 5.5. Regional employment increased faster in those regions that saw greater average savings in road travel times



Source: GDH, Turkish Statistical Institute and authors' calculations.
Note: Based on changes from 2006 to 2014.

**A ONE-HOUR REDUCTION
IN TRAVEL TIMES BETWEEN
TWO OF TURKEY'S
PROVINCIAL CENTRES
INCREASES BILATERAL
TRADE BETWEEN THOSE
PROVINCES BY**

6%



a result of better roads have also posted stronger (nominal) income growth.⁸ We measure improvements in market access by calculating an average of the reduction in travel times experienced by a province when selling goods/services to other provinces, weighted by the GDP of its trading partners (see Annex 5.1 for details).

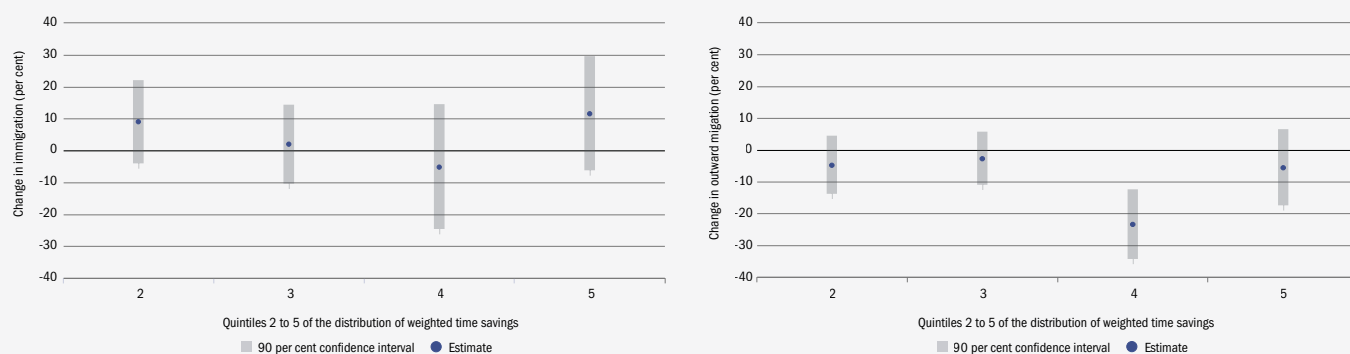
Improvements in market access tend, on average, to be associated with stronger income growth, although the effect is not statistically significant. Estimates obtained separately for each quintile of the distribution of improvements in market access do not show statistically significant effects either. This is consistent with earlier findings on provincial income growth in China.⁹

However, improvements in domestic market access have a positive impact on regional employment (see Chart 5.5). A one-hour reduction in average travel times from one provincial centre to other provincial centres in Turkey increases employment in that province by 0.6 per cent. With 22 of Turkey's 81 provinces (accounting for 4.5 per cent of initial employment) seeing average time savings of one hour or more, the impact on regional job opportunities is substantial. Furthermore, in the poorly connected provinces that saw the greatest improvements in market access, the estimated impact on employment is 40 per cent above the average, equivalent to about 0.9 percentage points.

⁷ See EBRD (2017), Chapter 3.

⁸ Turkey is divided into seven geographical regions, each made up of multiple provinces: Aegean, Black Sea, Central Anatolia, Eastern Anatolia, Marmara, Mediterranean and South-eastern Anatolia.

⁹ See Banerjee et al. (2012).

CHART 5.6. Road infrastructure upgrades prompted a decline in emigration from previously poorly connected regions between 2007 and 2015

Source: GDH, Turkish Statistical Institute and authors' calculations.



EVERY DOLLAR OF INVESTMENT IN TURKEY'S ROADS IS ESTIMATED TO GENERATE AN ADDITIONAL

18 CENTS

IN ANNUAL DOMESTIC TRADE BETWEEN TWO PROVINCES

Internal migration is one of the channels that could potentially lead to employment gains in hitherto poorly connected provinces. Indeed, we find that improved connectivity is associated with large reductions in outward migration from such regions (see Chart 5.6, right-hand panel). The impact on outward migration is particularly pronounced in the 40 per cent of regions with the largest amounts of travel time saved.

This suggests that better road links create employment opportunities that slow the depopulation of poorly connected regions. In contrast, there is no statistically significant evidence of any effect on inward migration (see the left-hand panel of Chart 5.6) or labour-force participation. This suggests that local job creation in response to the road improvements and the curbing effect this has had on outward migration are the main reasons for the change in employment patterns.

In sum, then, better infrastructure can help to enhance the economic prospects of underperforming regions. The objective of improving livelihoods in less developed regions tends to be high on policymakers' agendas in both middle-income and advanced economies. Regional policy, for example, is the single largest item in the European Union's (EU) budget for 2014 to 2020 (€352 billion, or around one-third of the total).¹⁰ A significant percentage of those funds is allocated to transport infrastructure, "for the proper functioning of the internal market

and for facilitating the circulation of people and goods within and beyond the EU"¹¹ and to spur "growth in sparsely populated areas and the outermost regions of the EU".¹² Evidence from Turkey, a large country with sizeable spatial income differentials, suggests that such policies can be effective in facilitating regional convergence, thus improving equality of opportunity across the economy.

BUILDING SUSTAINABLE CITIES TO FACILITATE ECONOMIC AGGLOMERATION

While we have focused here on improvements in inter-city transport infrastructure, municipal infrastructure (water, wastewater, refuse collection and recycling, urban transport) is another example of long-term investment that can boost growth and equality of opportunity. Such infrastructure helps to create sustainable cities, shaping a country's environmental footprint and people's livelihoods for centuries to come.

High-quality urban infrastructure supports economic clustering, enabling the greater agglomeration of people and firms within commuting distance of an economic centre. Clustering plays a major role in supporting the development of many sectors of an economy, as it increases the size of the markets to which firms can sell their goods and ideas and broadens the pool of talent from which they can recruit.¹³

¹⁰ See European Commission (2014).

¹¹ See European Commission (2014), pp. 7.

¹² See European Commission (2014), pp. 15.

¹³ See EBRD (2018).

ANNEX 5.1 REGRESSION ANALYSIS

BILATERAL TRADE AND TRAVEL TIMES

The calculation of the long-term growth rate of bilateral domestic trade flows between 2006 and 2015 takes the large increase in the extensive margin into account – a situation where a trading relationship is established between provinces that had not traded with each other before. The mid-point growth formula defines change in trade between a source province (*s*) and a destination province (*d*) as

$$ChangeTrade_{sd} = 2 \cdot \frac{trade_{sd}^{2015} - trade_{sd}^{2006}}{trade_{sd}^{2015} + trade_{sd}^{2006}} \quad (1)$$

where $trade_{sd}^{2015}$ and $trade_{sd}^{2006}$ denote the values of trade between the source province and the destination province in 2015 and 2006, respectively.¹⁴ This measure is constrained between -2 and 2. Less than 3 per cent of the well-defined pairs of provinces for which the ratio is calculated exhibit declines in bilateral trade between 2006 and 2015.

Our initial analysis of bilateral trade between provinces employs a gravity-type model using changes in trade flows (first-difference regression). In this regression, the dependent variable is the growth rate of bilateral domestic trade flows between Turkish provinces from 2006 to 2015. The savings on travel times between pairs of provinces are the independent

variable. First-difference estimation eliminates all time-invariant characteristics of the source province and the destination province. It also eliminates pair characteristics that affect bilateral trade, such as the distance between provincial capitals, and takes into account province-level characteristics that affect changes in trade in each province (with α_s and α_d representing fixed source and destination effects, respectively):

$$ChangeTrade_{sd} = \beta_0 + \beta_1 TimeSaving_{sd} + \alpha_s + \alpha_d + \varepsilon_{sd} \quad (1)$$

Standard errors are clustered at the source and destination levels (two-way clustering).

To test for non-linear effects, the continuous variable for time savings in equation (1) is replaced by indicator variables for each quintile of its distribution. Estimates are obtained in respect of trade flows within provinces (the omitted category). The results are reported in Table A.1 (column 1).

EXTENSIVE MARGIN OF TRADE

To examine the effect of road upgrades on the establishment of new trade links, a similar relationship is estimated for the probability of observing positive trade effects on a pair of provinces in 2015, where the pair had conducted zero trade in 2006. The results (reported in column 2 of Table A.1) are qualitatively similar to those obtained for increases in trade volumes.

TABLE A.5.1.1. Results of regression analysis

Dependent variable	Change in bilateral trade flows, 2005-15 [1]	New trade links in 2015 [2]	Change in GDP per capita [3]	Change in employment [4]	Change in immigration [5]	Change in emigration [6]
Time savings (hours)	0.061*** (0.011)	0.072*** (0.010)				
Time savings weighted by GDP			0.001 (0.001)	0.006* (0.003)	0.001 (0.002)	-0.003* (0.002)
Fixed effects	Source and destination	Source and destination	Region	Region	Region	Region
No. of observations	5,781	6,561	81	81	81	81
R ²	0.217	0.222	0.160	0.461	0.089	0.190

Source: GDH, Turkish Ministry of Industry, Turkish Statistical Institute and authors' calculations.

Note: All regressions are estimated using ordinary least squares. Robust standard errors with two-way clustering at the source and destination provincial level are indicated in parentheses. *, ** and *** denote values that are statistically significant at the 10, 5 and 1 per cent levels, respectively.

¹⁴ See Davis et al. (1996).

DELVING DEEPER: INCOME GROWTH, EMPLOYMENT AND MIGRATION

In the next section, we look at whether provinces that experienced greater improvements in market access as a result of upgrades to roads also recorded stronger income or employment growth. We also assess whether patterns of domestic migration to and from these provinces were different. Improvements in market access at the province level are measured by calculating a weighted average of the reductions in travel times experienced by firms in a given province when selling goods to customers in other provinces. The time savings for each province s , trading with a destination province d , are weighted on the basis of destination provinces' GDP figures for 2005, as follows:

$$WTimeSaving_s = \sum_{d=1}^{81} \frac{GDP_{d,2005}}{GDP_{Istanbul,2005}} TimeSaving_{sd} \quad (3)$$

The following equation is estimated for each outcome variable (such as income growth or migration flows):

$$Change[OUTCOME]_s = \delta_0 + \delta_1 WTimeSaving_s + \alpha_r + e_s \quad (4)$$

where α_r denotes fixed effects at regional level (aggregating multiple provinces).

Non-linear effects can be examined using a set of quintile indicator variables for the distribution of weighted time savings, as in the previous exercise. Data on provincial labour-force participation are only available for 2008 to 2013 and this analysis fails to find any impact on labour-force participation as a result of changes in market access. As data on bilateral migration flows are not available, this analysis uses data on changes in population flows in and out of each individual province. The results are reported in Table A.1, columns 3 to 6.



A ONE-HOUR REDUCTION IN THE AVERAGE TRAVEL TIME BETWEEN ONE TURKISH PROVINCIAL CENTRE AND ANOTHER INCREASES EMPLOYMENT IN THE PROVINCE BY

0.6%

6 BOOSTING SME PRODUCTIVITY

MOVING RESOURCES
AWAY FROM INEFFICIENT
FIRMS TO MORE EFFICIENT
ONES COULD RAISE TOTAL
FACTOR PRODUCTIVITY BY

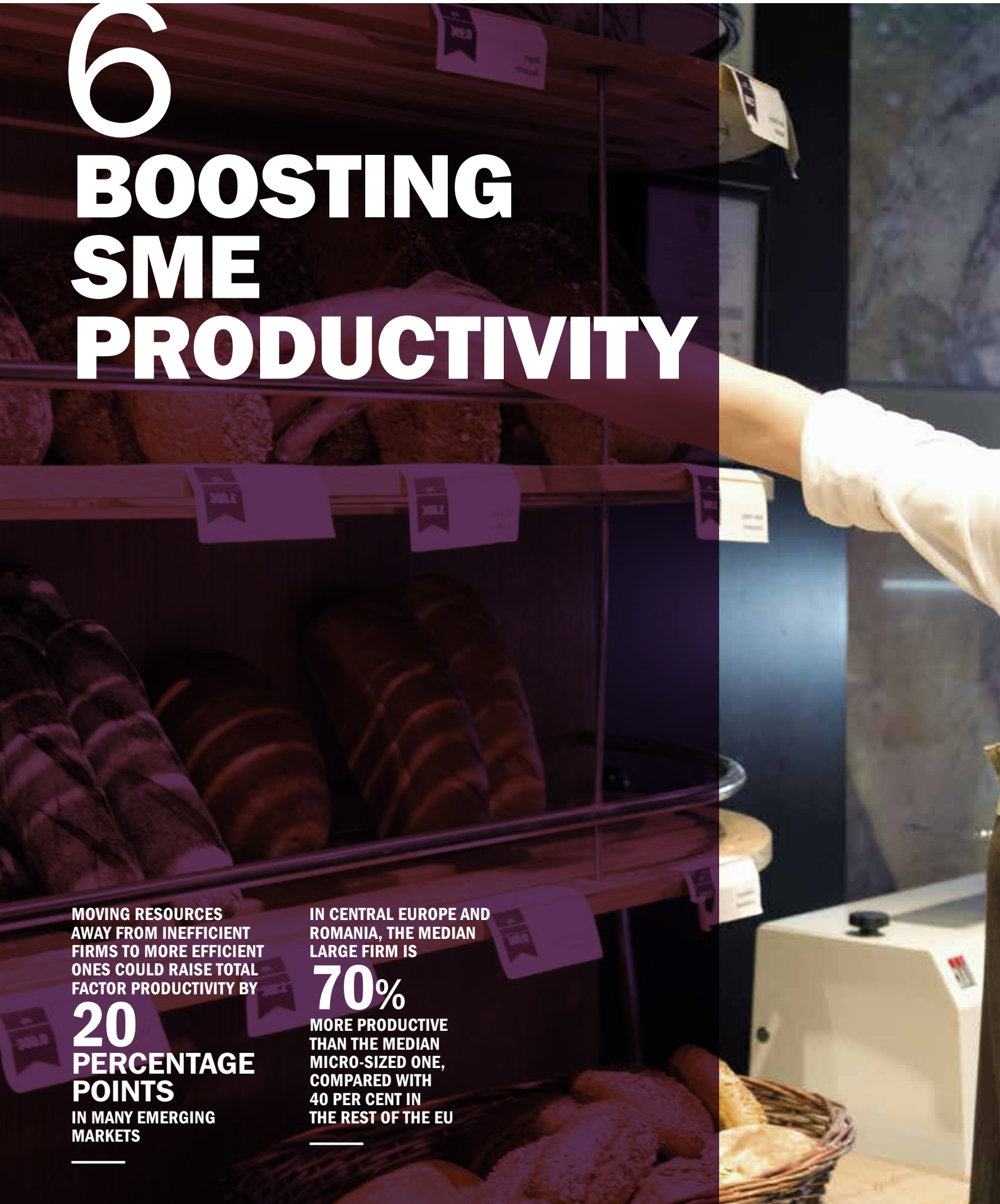
20
PERCENTAGE
POINTS

IN MANY EMERGING
MARKETS

IN CENTRAL EUROPE AND
ROMANIA, THE MEDIAN
LARGE FIRM IS

70%

MORE PRODUCTIVE
THAN THE MEDIAN
MICRO-SIZED ONE,
COMPARED WITH
40 PER CENT IN
THE REST OF THE EU



Predictably, firms in middle-income economies are less productive than their advanced-economy counterparts. However, the relative productivity gap is greater for small firms than for large enterprises. As countries develop, large enterprises, or “national champions”, may deliver fast growth and improvements in productivity. These enterprises, however, seldom excel in innovation on a global scale. As growth becomes more innovation intensive, the healthy ecosystem of small and medium-sized enterprises (SMEs) plays an increasingly important role. Yet regulation and poor governance in middle-income economies often create perverse incentives for firms to stay small, making it difficult for the countries to harness the innovation and creativity dividend.

➤

EVERY 10 PER CENT RISE
IN GDP PER CAPITA IN THE
EBRD REGIONS SAW A

6%

RISE IN PATENTS GRANTED
PER CAPITA IN 2002-15,
WHILE IN CHINA, SOUTH
KOREA AND ISRAEL
THE CORRESPONDING
INCREASE IN PATENTING
AVERAGED 19 PER CENT

◀ The change in economic model at the heart of the middle-income trap is also reflected in the ways that firms enter the market, grow and cease to exist. In general, firms and industries in middle-income economies tend to be less productive than firms and industries in advanced economies (see Chart 6.1). In fact, these differences in productivity add up to differences in per capita income, so economic convergence is essentially about boosting the productivity of firms.

This chapter documents the differences between SMEs in emerging and advanced economies, then describes why these differences should concern policymakers and discusses ways to create a more dynamic SME ecosystem.

HOW SMES IN EMERGING MARKETS ARE DIFFERENT FROM SMES IN ADVANCED ECONOMIES

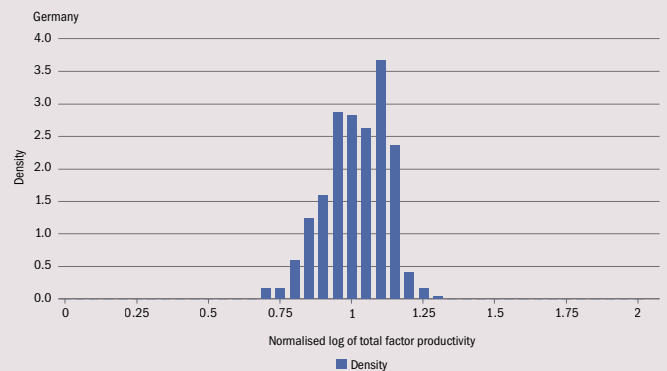
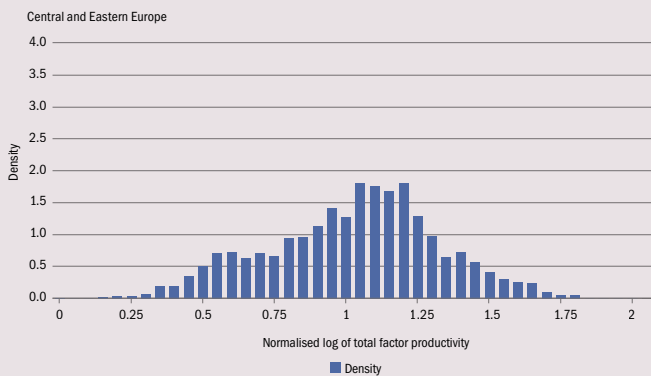
In middle-income economies small is not necessarily beautiful. On average, small firms tend to be less productive than large firms. This is to be expected if very productive small firms grow quickly, gain market share and become large, contributing to productivity growth in the economy as a whole. However, small

firms in the EBRD regions are found to be far less productive than their small counterparts in advanced economies, such as Germany. The difference between the productivity of large firms in the EBRD regions and large German firms is much smaller.

The inferior productivity levels of small firms are also evident when we compare small and large firms within the same economy. In central Europe and Romania, the median (typical) medium-sized firm is around 50 per cent more productive than the median micro-sized firm (see Chart 6.2). The median large firm is around 70 per cent more productive than the median micro-sized one. The respective ratios in the rest of the EU are considerably smaller, at 25 and 40 per cent, respectively.

As a result, emerging markets, including the EBRD regions, are home to an abundance of small, low-productivity firms that fail to innovate or grow, but manage to survive.¹ In advanced economies surviving firms tend to prosper, giving rise to a positive relationship between a firm’s age and size – a relationship that is often absent in emerging markets. For instance, companies in the USA grow fivefold, on average, in their first 30 years, while their Indian counterparts show barely any growth.²

CHART 6.1. Productivity varies considerably across industries



Source: EBRD (2017).
 Note: The analysis uses a combined industry-level sample, including Croatia, Estonia, Latvia, Lithuania, Poland, Romania, the Slovak Republic and Slovenia. Total factor productivity is normalised for each industry-country pair by removing the regional average. Cross-country differences in industry composition are controlled for. Density is calculated by dividing the relative frequency by the width of the class.

SMALL FIRMS IN THE EBRD REGIONS ARE FOUND TO BE FAR LESS PRODUCTIVE THAN THEIR SMALL COUNTERPARTS IN ADVANCED ECONOMIES, SUCH AS GERMANY.



¹ See EBRD (2014, 2017).

² See Hsieh and Klenow (2014).

This lack of dynamism also affects countries in the EBRD regions, where one in three firms did not change size-wise during a 12-year period (see Chart 6.3). In addition, the chances of a small firm growing or shrinking appear to be loosely related to its productivity.³ In contrast, only one in five firms in the rest of the EU remained static in size over the period 2002-13 and growth is typically conditional on productivity improvements.⁴

More generally, middle-income economies tend to be characterised by far more disparate company productivity levels, as many unproductive firms survive (see Chart 6.1). IMF estimates from 2017 suggest that improving the company-productivity dispersion profile to that of advanced economies – by moving resources away from inefficient firms to more efficient ones – could raise total factor productivity by around 20 percentage points in many emerging markets.⁵

Up to a certain point, lack of dynamism among small firms may matter less for development, as long as large enterprises are able to deliver sizeable improvements in productivity by importing existing technologies. These enterprises, however, seldom excel in innovation on a global scale. As growth becomes more innovation intensive, the healthy ecosystem of small and medium-sized enterprises (SMEs) starts to play an important role.

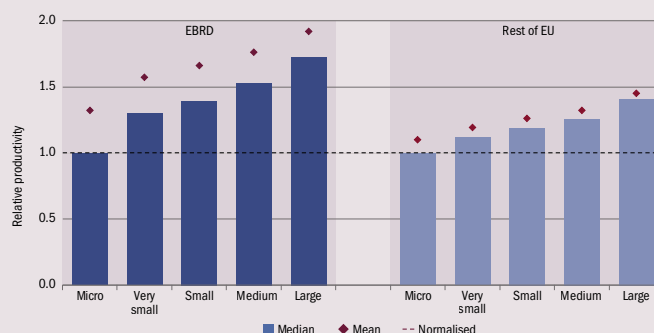
Most notably, SMEs increasingly engage in innovation that pushes the technological frontier. Frontier innovation is often protected by patents, which can be used to create a snapshot of innovative activity across economies. While emerging Europe has seen a considerable rise in per capita income since the mid-1990s, the increase in its rate of innovation has been far lower than in China, South Korea or Israel. The average stock of patents granted per 10,000 people in the EBRD regions increased by less than 50 per cent, on average, between 2002 and 2015. It more than quadrupled in South Korea and grew more than 30-fold in China, albeit from a low base (see Chart 6.4).

As a result, every 10 per cent rise in GDP per capita in the EBRD regions between 2002 and 2015 saw a 6 per cent rise in patents granted per capita, while in China, South Korea and Israel the corresponding increase averaged 19 per cent. Thus, growth has been relatively light on innovation in the EBRD regions, but more innovation intensive in comparator economies.

SHOULD POLICYMAKERS BE CONCERNED?

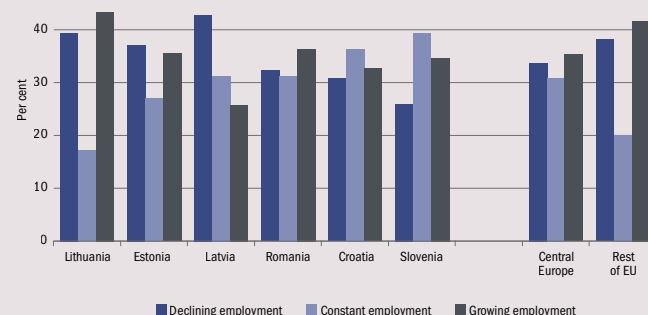
Job creation is often of primary concern to policymakers. Precisely where those jobs are created is also important – even more so in economies with highly disparate productivity across firms and industries. Aggregate productivity rises when company productivity improves, but it also rises when jobs are created in productive firms and disappear in unproductive ones. New market entrants tend to emulate fast-growing firms, which helps to spread successful management practices and promising technologies when markets function well. If firms that enter the market are able to combine labour and capital more efficiently than firms that shut down, the efficiency of production in the economy as a whole is boosted by this process of “creative destruction”.

CHART 6.2. Smaller firms are relatively inefficient, especially in central Europe and Romania



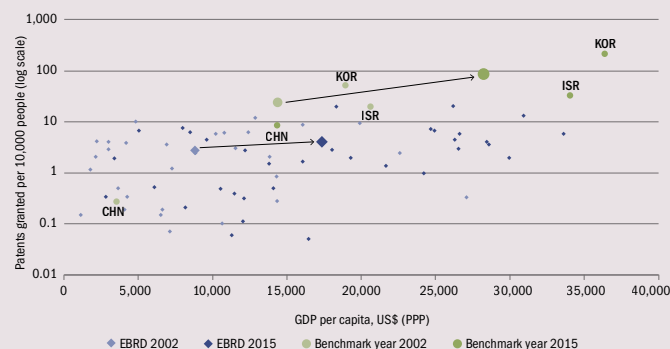
Source: EBRD (2017) based on CompNet (European Central Bank's Competitiveness Network) data. Notes: Data for 2002 to 2013. EBRD regions include Croatia, Estonia, Hungary, Latvia, Lithuania, Romania and Slovenia. Rest of EU includes Belgium, the Czech Republic, Denmark, Finland, Malta, Italy, Portugal and Spain. Productivity levels are normalised to 1 for the median micro-sized firm in EBRD regions and Rest of EU. Ratios with respect to the median micro-sized firm are calculated for each size, country and year, then simple averages are taken across regions and years.

CHART 6.3. Many firms in emerging Europe had stable headcount from 2002 to 2013



Source: CompNet and authors' calculations. Note: Based on data for the period 2002-13. Growth rates are calculated on the basis of the number of full-time employees over a three-year period for surviving firms. “Declining employment” means an average decline of more than 1 per cent per annum, while “growing employment” means average growth of more than 1 per cent per annum. All other cases are regarded as “constant employment”.

CHART 6.4. Growth in the EBRD regions has been relatively light on innovation



Source: EBRD (2017). Note: Larger diamonds represent the average for the EBRD regions. Larger circles represent the average for China, Israel and South Korea.

³ See Bircan (forthcoming).

⁴ See EBRD (2017).

⁵ See IMF (2017a).

Reassuringly, more productive firms and industries enjoy higher job creation rates (see Chart 6.5).⁶ An industry in emerging Europe that is as productive as its counterpart in Germany, for instance, enjoys a rate of net job creation in excess of 2 per cent. An industry that is only half as productive as its German counterpart creates jobs at a rate of 0.9 per cent per annum in net terms.

WHAT CAN BE DONE?

Policies designed to support SME development need not necessarily target the number of small firms or the share of small firms in an economy. Rather, priority should be given to creating a level playing field, making market entry straightforward for new firms, permitting young and innovative firms to grow fast and improve productivity. This allows the most productive SMEs to become successful, large and integrated into the global economy.

Consequently, even if SMEs do not necessarily account for a large share of an economy's output or employment, the success of the economic development model continues to rely on a well-functioning SME ecosystem.

In practice, regulations and poor governance often create perverse incentives for firms to stay small. Sometimes this is because larger firms are subject to much more onerous regulations in an attempt to protect jobs and create employer-based social-security nets. In Peru, for instance, a marginal increase in sales can lead to a drop in profitability of 25 per cent or more, as the firm is obliged to switch from one set of labour-code provisions to another once its annual income surpasses a certain level. This creates strong disincentives to grow beyond a certain size.⁷

In other cases, rent-seeking and predatory behaviour by national authorities may force firms to stay small and remain "under the radar". This can happen when the enforcement of certain rules and regulations – rather than the regulations themselves – is strongly linked to a firm's size. More robust property rights may be needed to prevent vested interests and incumbent firms from expropriating the intellectual and physical property of successful market newcomers. In short, therefore, completing the middle-income transition depends very much on institutional improvements that can boost the dynamism of small and medium-sized companies.

Slow corporate productivity growth appears to be further linked to the prevalence of family ownership in EBRD regions.⁸ The dominance of family ownership and management is often symptomatic of a lack of trust in the economy and a weak rule of law. In such conditions proprietors are often reluctant to hire professional managers with the right education and skills, to delegate tasks or yield control of company operations to take advantage of growth opportunities.⁹

Under-developed infrastructure and imperfections in the credit market may also prevent firms from accessing resources that are essential to scaling up operations. Small and innovative firms are at a particular disadvantage when it comes to accessing external capital, due to their lack of credit history with lenders and/or lack of tangible collateral.

More credit is not necessarily the answer, though. More accommodating financing conditions in the decade following the global financial crisis of 2008-09 have actually made it easier for large, less productive firms to stay in business, both in advanced economies and emerging markets. Creating a supportive environment for SMEs requires a different type of finance – such as specialised finance for innovation or equity – as we discuss further in Chapter 8.

Even in the presence of various constraints, greater market competition and openness to trade can substantially strengthen firms' motivation to improve their productivity and create jobs. Consider two industries with a productivity level of around 80 per cent of their counterparts in Germany. An open industry (one where production imports and output exports exceed 90 per cent of output by value) is estimated to create jobs at a rate of 2.5 per cent. An industry closed to trade (where the same ratio is less than 15 per cent) only creates jobs at a rate of 0.7 per cent (see Chart 6.6).

The same is true for industries that are integrated into global value chains versus industries that are not.¹⁰ Participation in international trade and global value chains helps speed up the reallocation of factors of production, including labour, to more efficient use, boosting productivity growth. In this regard, the market entry of multinationals through foreign direct investment may be an important source of productivity growth. Productivity spillovers are not uniform, however; they depend on the depth of local processing and on the industry in question.¹¹



IN PERU, A MARGINAL INCREASE IN SALES CAN LEAD TO A DROP IN PROFITABILITY OF

25%

OR MORE, AS FIRMS MUST SWITCH FROM ONE SET OF LABOUR-CODE PROVISIONS TO ANOTHER AS THEY GROW

⁶ See also EBRD (2017).

⁷ See IDB (2018) and Azuero et al. (2017) for an example from Peru.

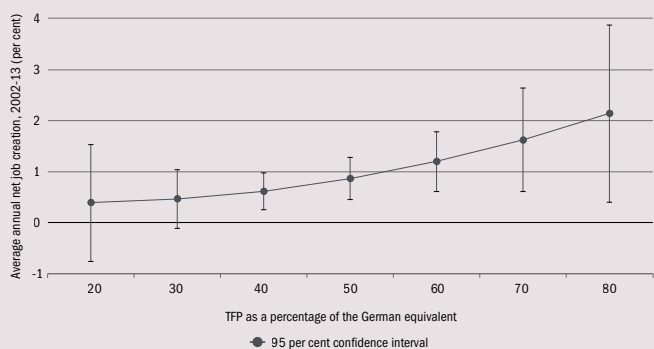
⁸ See Bloom et al. (2014) and Aghion and Bircan (2017).

⁹ See Akcigit et al. (2016).

¹⁰ See EBRD (2017).

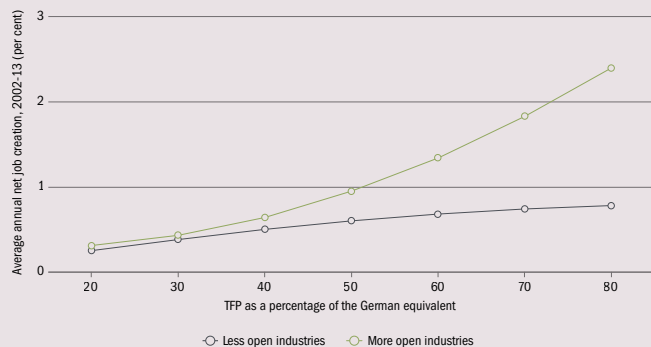
¹¹ See Fons-Rosen et al. (2018).

CHART 6.5. More productive industries create more jobs



Source: EBRD (2017).
 Note: Results are predicted growth rates from a country-by-industry panel regression of net job creation rates on relative TFP levels with respect to Germany, lagged by one period and controlling for country, industry and year fixed effects. The time period covered is 2002 to 2013. Vertical bars around estimates indicate the 95 per cent confidence interval.

CHART 6.6. Trade openness helps reallocate jobs to more productive industries



Source: EBRD (2017).
 Note: Results are predicted growth rates from a country-by-industry panel regression of net job creation rates on relative TFP levels with respect to Germany, trade openness and their interaction, all lagged by one period and controlling for country, industry and year fixed effects. The time period covered is 2002 to 2013. "Less open" and "more open" refer to industries with ratios of (exports + imports)/output equal to 15 per cent and 90 per cent, respectively. These numbers indicate the 25th and 75th distribution percentiles.

THE AVERAGE STOCK OF PATENTS GRANTED PER CAPITA IN THE EBRD REGIONS INCREASED BY LESS THAN

50%

BETWEEN 2002 AND 2015, WHILE IT MORE THAN QUADRUPLED IN SOUTH KOREA



7 GREEN GROWTH





Middle-income economies are high polluters – a reflection of the distorted incentives firms often face.

As economies develop, companies tend to industrialise before they strengthen their comparative advantages in low-pollution sectors (such as knowledge-intensive services). This gives rise to the so-called environmental Kuznets curve, whereby middle-income economies become more polluting per unit of GDP than low-income or high-income countries. Making growth greener requires creating the right incentives for energy savings. In countries where energy subsidies are absent or near absent, better-managed firms are 20 to 30 per cent more energy efficient than poorly managed firms. In countries with high energy subsidies, well-managed firms tend to be more energy intensive and less energy efficient.

➤

IN COUNTRIES WITH NO ENERGY SUBSIDIES, BETTER-MANAGED FIRMS ARE

20-30%

MORE ENERGY EFFICIENT THAN POORLY MANAGED FIRMS

IN 2013, GREENHOUSE GAS EMISSIONS IN LOW-INCOME COUNTRIES WERE

175% HIGHER

THAN IN 1992

◀ Sustainable development – development that meets the needs of the present without compromising the ability of future generations to meet their own needs¹ – is at the heart of the global policy agenda. The UN’s Sustainable Development Goals and the Paris Agreement establish a common platform for international cooperation in the areas of development and climate change, based on three main pillars of sustainable development: economic growth, environmental protection and social equality.

The confluence of economic growth and environmental sustainability has become known as “green growth”. Green growth supports the creation of jobs and helps to boost living standards, while at the same time preserving natural resources, clean air, water and other environmental public goods for future generations.

Making growth environmentally sustainable, however, is a major challenge, particularly for middle-income economies. As economies develop, they tend to industrialise before they strengthen their comparative advantages in low-pollution sectors, such as knowledge-intensive services. As a result, middle-income economies tend to be more polluting per unit of GDP than low-income and high-income economies (see Chart 7.1). This regularity became known as the environmental Kuznets curve.

Since 1992, aggregate greenhouse gas (GHG) emissions have increased, on average, in low-, middle- and high-income countries alike (see Chart 7.2; availability of data prior to the 1990s is limited). The increase in emissions has been most substantial in those countries that were classified by the World Bank in 1992 as being low income (many of those economies have since reached middle-income status).² By 2013, the volume of their greenhouse gas emissions had increased by 175 per cent. The sharp rise reflects both their industrialisation and rapid population growth. High-income country emissions increased by 7 per cent, on average, over the same period and declined slightly in per capita terms.

Per unit of output, however, there have been substantial reductions in greenhouse gas emissions across economies of all income levels (see Chart 7.3). On this measure, the decline has been highest among those economies classified as middle income in 1992.

Almost 80 per cent of global emissions of greenhouse gases originate in the energy sector. Beyond this, the source of emissions varies depending on a country’s stage of development.

Rich countries’ emissions are largely dominated by power and transport. Middle-income countries’ emissions are shaped by power and industry. Emissions in low-income countries stem largely from agriculture. Among the low-income economies, the percentage of greenhouse gas emissions originating in the energy sector has been increasing since the early 1990s and reached 44 per cent in 2013. In middle-income economies the trend has been similar, with the energy sector’s share of total emissions totalling 70 per cent in the mid-2010s.

Carbon dioxide (CO₂) accounts for 94 per cent of all energy-related greenhouse gas emissions. To understand the trends in energy-related CO₂ emissions ($CO_{2,energy}$), it is useful to break down total emissions into three contributing factors – carbon intensity (carbon emitted per unit of energy E), energy intensity (energy consumption per unit of GDP) and GDP:

$$CO_{2,energy} = \frac{CO_{2,energy}}{E} * \frac{E}{GDP} * GDP$$

As GDP rises, the carbon intensity of energy production or the energy intensity of output (or both) has to fall for overall carbon emissions to decline.

CARBON INTENSITY IN THE ENERGY SECTOR

The carbon intensity of the energy sector in middle-income countries has remained broadly stable, with fossil fuels accounting for 53 per cent of electricity generation in 2015. In high-income economies, carbon intensity has decreased, while it has been increasing in low-income economies where energy production tends to be based on cheaper, but less environmentally friendly technologies (see Chart 7.4). Indeed, the reliance of low-income economies on “dirty” fossil fuels (such as coal, oil and gas) has increased over time, primarily due to the use of coal and peat (see Chart 7.5).

ENERGY INTENSITY OF GDP

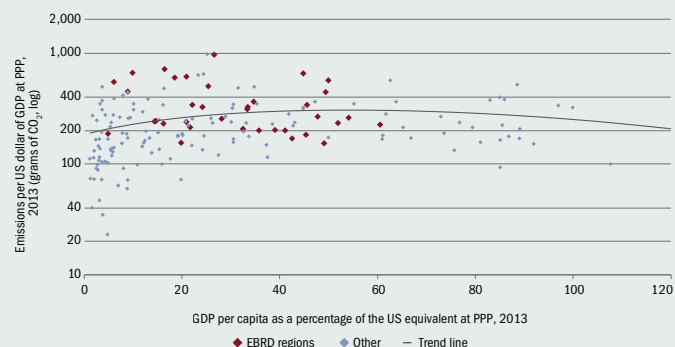
The energy intensity of GDP is determined largely by the sectoral structure of each economy and energy efficiency of production within each industry, although other factors, such as weather conditions and the standard of living (reflected in the availability of heating or air conditioning), also play a role. Reductions in energy intensity can be traced back to structural changes (shifts to less energy-intensive economic activities, such as services) and improvements in energy efficiency.



¹ See World Commission on Environment and Development (1987).

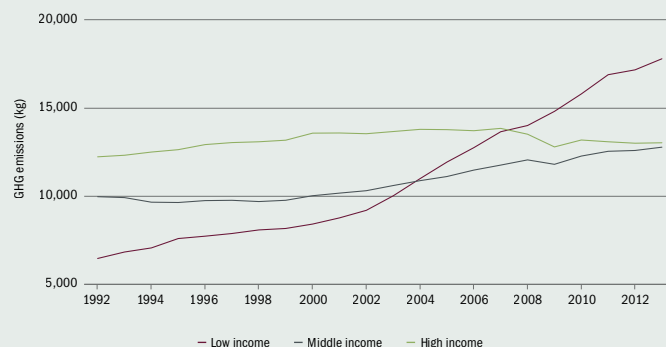
² In 1992, economies with gross national income (GNI) below US\$ 675 per capita using Atlas methodology were classified by the World Bank as low-income; those with GNI above US\$ 8,355 were classified as high-income. Many economies classified as low-income in 1992 have since reached middle-income status. For instance, based on the World Bank classification method, China moved from the low-income group to the middle-income group in 1999.

CHART 7.1. Emissions per unit of GDP are highest in middle-income economies



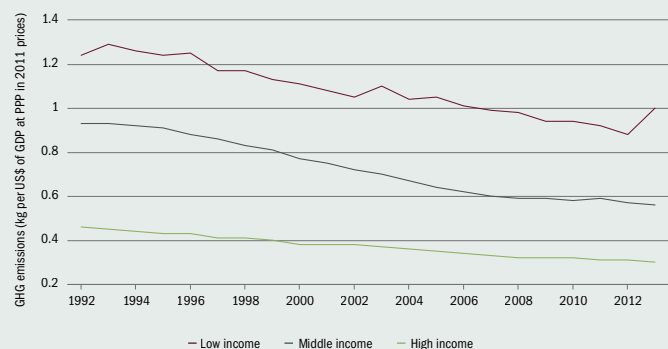
Source: World Resources Institute (2017), IMF and authors' calculations.
 Note: The trend line is based on a polynomial fit.

CHART 7.2. Aggregate greenhouse gas emissions have been rising



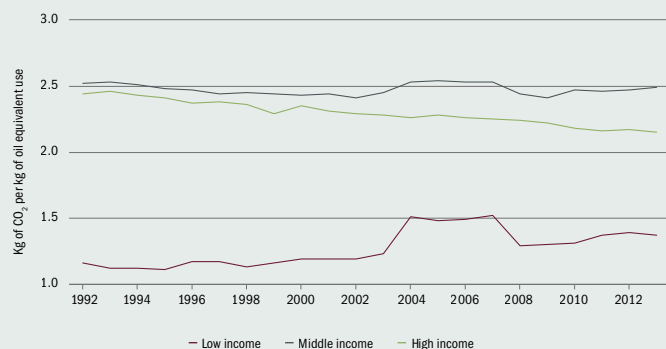
Source: World Resources Institute (2017) and authors' calculations.
 Note: Data represent unweighted averages based on country groupings in 1992.

CHART 7.3. Greenhouse gas emissions per unit of output have been declining



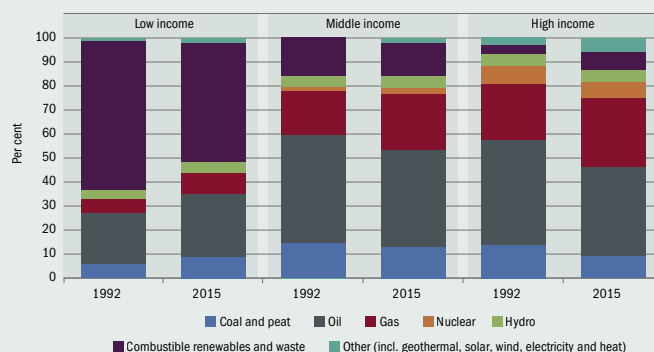
Source: World Resources Institute (2017) and authors' calculations.
 Note: Data represent unweighted averages based on country groupings in 1992.

CHART 7.4. Carbon intensity of the energy sector in middle-income countries has remained broadly stable



Source: World Bank and authors' calculations.
 Note: Data represent unweighted averages based on country groupings in 1992.

CHART 7.5. Carbon, oil and gas account for almost 80 per cent of primary energy supply in middle-income economies



Source: IEA data from World Energy Balances 2017 (IEA 2016) and authors' calculations.
 Note: Data represent unweighted averages based on country groupings in 1992. Based on IEA data from World Energy Balances 2017, © OECD/EIA 2016, as modified by the authors; www.iea.org/statistics. Licence: www.iea.org/t&c.



CARBON, OIL AND GAS ACCOUNT FOR ALMOST

80%

OF THE PRIMARY ENERGY SUPPLY IN MIDDLE-INCOME ECONOMIES

The average energy intensity of output has decreased across all country groupings since 1992. The declines have been larger in the low-income and middle-income countries, primarily due to the rising share of services in total value added. Nonetheless, in terms of the level of energy intensity of production, middle-income economies lag high-income countries (see Chart 7.6).

ENERGY SUBSIDIES, THE QUALITY OF MANAGEMENT AND ENERGY INTENSITY

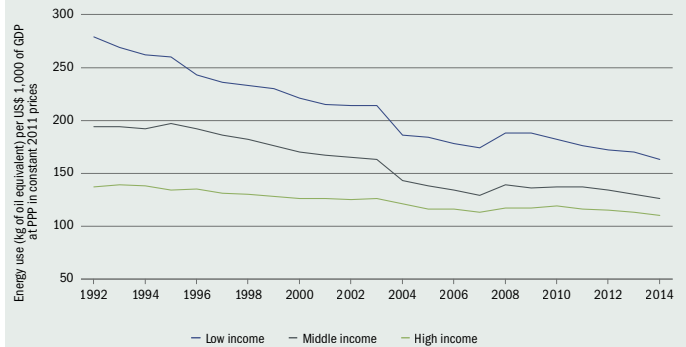
Energy intensity of industries and economies reflects choices made by individual firms about what to produce and which technologies to use. These choices are, in turn, influenced by countries' energy policies. It remains common for middle- and low-income countries to subsidise fossil fuels and electricity generated from fossil fuels, sometimes in an attempt to boost an economy's competitiveness and sometimes in an attempt to increase the purchasing power of the poor, even though the benefits of energy subsidies accrue primarily to the rich, who consume more energy.

When establishing frameworks for energy prices, few countries take into account the costs associated with global warming, local pollution, or forgone consumption-tax revenues (see Chart 7.7). Failure to incorporate such externalities can also be thought of as a form of subsidy – the difference between the price of energy and the price that reflects all the social costs of energy generation.

Overall energy subsidies, explicit and implicit, have decreased on average since 2013, but they remain highest in the middle-income economies. Explicit fossil-fuel subsidies in middle-income countries, excluding under-priced externalities and forgone taxes, had a total value of US\$ 234 billion in 2015 (equivalent to 1.4 per cent of their GDP), according to a recent study.³ Subsidies including under-priced externalities and favourable tax treatment totalled US\$ 1.3 trillion in 2015 (7.8 per cent of GDP).

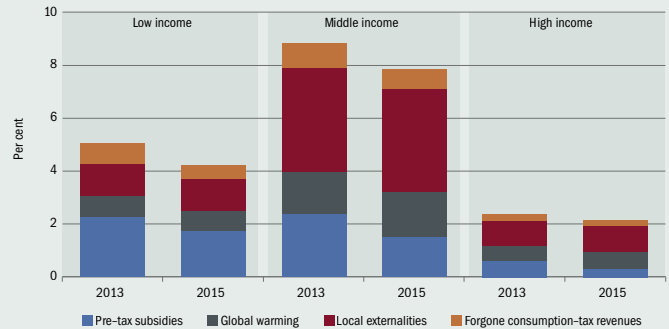
This policy distortion makes fossil fuels (and electricity generated from them) cheaper for both households and firms, with a corresponding effect on their energy usage. In general, better-managed firms appear to be able to achieve lower energy intensity of production, particularly in energy-intensive industries.⁴ They typically do so by using more efficient production techniques. On the other hand, better-managed firms also optimise the balance of production inputs.

CHART 7.6. Energy intensity of GDP in middle-income economies has declined, but remains above levels observed in advanced economies



Source: World Bank World Development Indicators and authors' calculations. Note: Data represent unweighted averages based on country groupings in 1992.

CHART 7.7. Fossil-fuel subsidies as a percentage of GDP are highest in middle-income economies



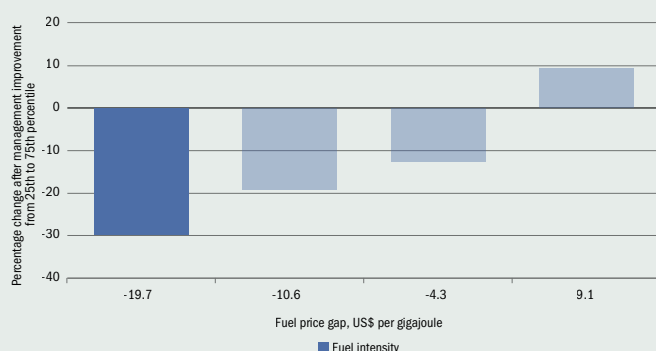
Source: IMF Energy Subsidies Template and authors' calculations. Note: Data represent unweighted averages across country groupings as of 1992. Total subsidies include both consumption and production-related subsidies (inclusive of externalities and tax treatment).

FOSSIL FUELS ACCOUNTED FOR 53% OF ELECTRICITY GENERATION IN MIDDLE-INCOME ECONOMIES IN 2015

³ See Coady et al. (2017).

⁴ Bloom et al. (2010), Martin et al. (2012) and Boyd and Curtis (2014).

CHART 7.8. Energy intensity of production in energy-intensive industries according to level of fuel subsidy



Source: Schweiger and Stepanov (2018).

Note: Energy intensity is calculated as the energy cost per US dollar of sales. Solid bars denote estimates that are statistically significant at the 10 per cent level.

**INCLUDING
UNDER-PRICED
EXTERNALITIES
AND FAVOURABLE
TAX TREATMENT,
FOSSIL-FUEL SUBSIDIES
IN MIDDLE-INCOME
COUNTRIES AVERAGE**

7.8% OF GDP

The availability of energy subsidies for fossil fuels and electricity generated from them means that better-managed firms may use more of the cheaper resource (energy) and, thus, be more energy intensive. A recent paper confirms this.⁵ In sectors where energy accounts for a higher portion of production costs, firms are likely to be more sensitive to energy prices in general and the availability of energy subsidies in particular. Improving the quality of management practices from the 25th to the 75th percentile of the distribution of management quality is associated with an *increase* of almost 10 per cent in the fuel intensity of production in highly energy-intensive sectors in a country with high fuel subsidies (not taking into account externalities and tax treatment) – namely, those in the top 25 per cent of the relevant distribution. In sharp contrast, the same improvement in management quality in countries where subsidies are negligible is associated with an almost 30 per cent reduction in the fuel intensity of production (see Chart 7.8).

In other words, better-managed firms in highly energy-intensive sectors are less fuel intensive when fuel prices are not distorted by subsidies and more fuel intensive when subsidies are high. The analysis can be repeated for individual industries, as energy intensity differs widely between firms within narrowly defined sectors.⁶ We now look at all sectors, including those with relatively low energy intensity of production. When sector-level measures of fuel subsidies are used, improving the quality of a firm's management practices from the 25th to the 75th percentile of the distribution is associated with a 3 per cent decrease in fuel intensity in a country sector in the top quartile of the distribution of price subsidies. In a country sector in the bottom quartile in terms of subsidies, the same improvement in the quality of management practices is associated with a much higher (19 per cent) decrease in fuel intensity.

Well-managed firms achieve lower energy intensity thanks to better incentive structures and better target management. High-powered incentives make managers more responsive to changes in energy prices.

TAKING THE LONGER-TERM VIEW

Development in and of itself may not help to reduce pollution, at least not fast enough to ensure a better quality of life and meet global climate-change targets. A powerful way of achieving both development and environmental objectives would be to create the right incentives for firms. Markets are good at responding to incentives – cynically, too, if incentives are distorted by energy subsidies. Phasing out such subsidies is a clear policy priority.

While regulations associated with phasing out environmental protection and eliminating energy subsidies are often perceived as a burden on economic development, green investment pays off in the long run, as it spurs innovation, promotes efficient solutions and helps countries complete their middle-income transitions.

⁵ See Schweiger and Stepanov (2018).

⁶ See Lyubich et al. (2018).

8 FINANCE



Finance matters to middle-income transitions, particularly the way in which it is structured. Our analysis of episodes of sustained strong growth shows that high levels of private-sector credit as a percentage of GDP are less likely to be associated with economic out-performance and more likely to be linked to poor performance. This relationship actually predates the global financial crisis of 2008-09. The depth of equity markets, in contrast, has a positive correlation with robust economic growth. Deeper equity markets are also associated with a gradual decline in CO₂ emissions, especially in relatively polluting industries, while the opposite is true for debt markets.

➤

THE MATURITIES OF
DOMESTIC BONDS ISSUED
IN EMERGING MARKETS
ARE, ON AVERAGE,
MORE THAN

**2
YEARS**

SHORTER THAN THOSE OF
EQUIVALENT BONDS IN
ADVANCED ECONOMIES

QUANTITY VERSUS QUALITY OF FINANCE

An extensive body of literature provides convincing evidence that financial development – the emergence and growth of banking sectors and stock markets – has a causal and positive impact on long-term growth in low-income economies, mainly by fostering total factor productivity (the efficiency with which various factors of production are combined).

In the case of middle-income transitions, however, the evidence suggests that the structure, or “quality”, of finance is becoming increasingly important. A few decades ago, many middle-income economies had relatively shallow financial markets. More recently, there have been growing concerns about the over-indebtedness of emerging markets. Corporate debt in large middle-income economies has increased substantially and, in some cases, now exceeds that of advanced economies as a percentage of GDP (see Chart 8.1).

Our analysis of episodes of sustained strong growth, discussed earlier in this report, shows that deepening private-sector credit as a percentage of GDP tends to make economic out-performance less likely and poor performance more likely. This relationship actually predates the global financial crisis of 2008-09.

The depth of equity markets, in contrast, is positively correlated with strong economic growth. This is in part due to banks’ propensity to support older, tested technologies. On the other hand, private equity venture capital, seed capital and other equity instruments are better suited to be deployed to back innovative, forward-looking ideas. In addition, technological change has heightened the importance of investment in assets such as research and development, software, patents and licences, which may be difficult to value or collateralise. Such “intangible” investments rely heavily on specialised forms of non-bank finance.

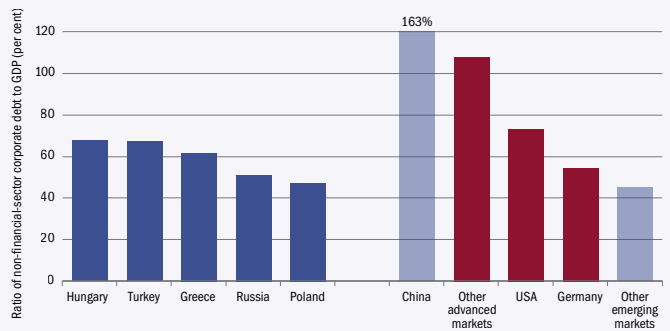
While the success of middle-income transitions may have become less dependent on an abundance of debt finance, it remains crucial that financial crises are managed well.¹ In this regard, the provision of longer-term finance and financing in local currency can reduce the vulnerability of middle-income economies to external shocks. In countries

where non-performing loan (NPL) levels are high, swift resolution is associated with a substantial growth dividend.²

Longer maturities can also help to create more stable financial structures. Paradoxically, the average maturity of debt at issuance nowadays tends to be shorter in countries with higher GDP per capita and higher private credit-to-GDP ratios.³ This unexpected finding is driven by the composition of debt. The maturities of bonds issued domestically in emerging markets are, on average, more than two years shorter than those of equivalent bonds in advanced economies. However, fewer firms tap domestic bond markets in middle-income economies.⁴ Firms that raise finance abroad do so at significantly longer maturities, whether in the form of bond issuance or syndicated loans. In part, this is because proceeds are often used for infrastructure projects with long payback periods. In addition, emerging-market borrowers in international markets are predominantly large corporations, while smaller borrowers in international markets are typically from advanced economies.

In sum, the percentage of firms using long-term debt markets is smaller in emerging markets (see Chart 8.1). Smaller firms in these economies continue to rely, at least for the time being, on shorter-term instruments such as commercial paper or traditional bank loans.

CHART 8.1. The ratios of non-financial-sector corporate debt to GDP are high in many middle-income economies



Source: Bank for International Settlements (BIS) and authors’ calculations.

CARBON EMISSIONS PER UNIT OF GDP START TO DECLINE WHEN COUNTRIES REACH PER CAPITA INCOME OF
US\$ 40,000



¹ See also Eichengreen et al. (2015).

² Balgova et al. (2017).

³ See Cortina et al. (2017).

⁴ See De Haas and van Horen (2017).

FINANCE AND THE ENVIRONMENTAL KUZNETS CURVE

The structure of the financial system also has an impact on the amount of environmental pollution that accompanies the middle-income transition. As discussed earlier, pollution increases in early stages of development, but will decline once a country surpasses a certain income level, in accordance with the environmental Kuznets curve.⁵ As a result, pollution can be at its worst when countries reach middle-income status. Two mechanisms underpin the environmental Kuznets curve hypothesis. First, in the early stages of development, a move from agriculture to manufacturing and heavy industry is associated with higher income and more pollution per capita (see Charts 8.3 and 8.4). Second, at some point, the structure of the economy moves towards light industry and services (see Chart 8.5) and the shift is accompanied by a levelling off of pollution, and in some cases a reduction in the amount of pollution per capita.

In addition to sectoral shifts, the adoption of more advanced technologies can substitute clean production methods for dirty ones and reduce pollution per unit of output in a given sector.

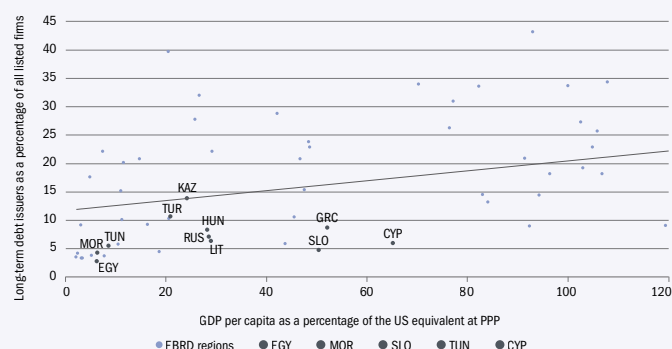
A logical question, therefore, is whether finance has an impact on the two main mechanisms underpinning the environmental

Kuznets curve: a shift towards less polluting sectors and an innovation-driven reduction in sectoral pollution? Are well-developed banking sectors and stock markets detrimental to the environment, as they fuel consumption growth and the concomitant emission of pollutants? Or can financial development steer economies towards more sustainable growth by favouring clean industries over dirty ones?

Recent research has started to disentangle this nexus between finance, growth and pollution, as proxied by the emission of CO₂.⁶ A move towards green technologies in middle-income economies can require substantial investment. Such investments are dependent on the availability of external finance. Schumpeterian growth models suggest that financial constraints can prevent firms in less-developed countries from exploiting research and development carried out in countries closer to the technological frontier.⁷ Financial development can thus facilitate the adoption of state-of-the-art technologies and help mitigate environmental pollution. But what kind of financial development?

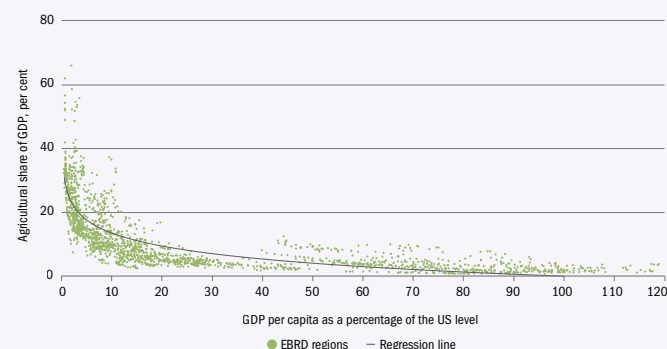
Do banks or stock markets do a better job of enabling green investment? For a variety of reasons, banks may be less suited to financing projects that reduce industrial pollution. First, banks are

CHART 8.2. Long-term debt issuers are more prevalent in higher-income countries



Source: Cortina et al. (2017).
 Note: Long-term debt issuers are firms that issued at least one bond or syndicated loan between 2003 and 2011.

CHART 8.3. Agricultural share of total value added declines as per capita income rises



Source: World Bank and authors' calculations.

DO BANKS OR STOCK MARKETS DO A BETTER JOB OF ENABLING GREEN INVESTMENT? FOR A VARIETY OF REASONS, BANKS MAY BE LESS SUITED TO FINANCING PROJECTS THAT REDUCE INDUSTRIAL POLLUTION



⁵ See also Grossman and Krueger (1995) and Hettige et al. (2000).

⁶ See De Haas and Popov (2018).

⁷ See Aghion et al. (2005).

technologically conservative; they tend to fear that funding new technologies (which tend to be cleaner) erodes the value of the collateral underlying existing loans. Such collateral (machinery and equipment or industrial facilities) largely involves old (dirtier) technologies.⁸ Second, banks can hesitate to finance green technologies if the related innovation involves assets that are intangible, firm-specific and linked to human capital – assets that are harder to value as collateral and more difficult to sell in the event of non-repayment. Third, banks often operate on a shorter time horizon (the loan maturity) than equity investors. They are consequently less interested in whether assets are likely to become less valuable (or even stranded) in the distant future.

In contrast, stock markets may be better suited to financing innovative (and greener) industries. Equity contracts are more appropriate for financing green innovations that are characterised by high risks and high potential returns. Equity investors also tend to pay more attention to future pollution, so stock prices rationally discount the future cash flows of polluting industries. Empirical evidence shows that stock markets, indeed, punish firms that perform badly in environmental terms (for instance, those that have been involved in environmental accidents) and reward firms that are environmentally friendly.⁹ Ultimately, however, whether banks or stock markets are better suited to limiting or even reducing environmental pollution remains an empirical question.

FINANCE AND POLLUTION: KEY FACTS

Recent research on the relationship between financial development and environmental pollution has uncovered four main empirical facts.¹⁰

First, at country level, growing credit markets are associated with higher levels of CO₂ emissions. In sharp contrast, larger stock markets are associated with substantially lower levels of CO₂ emissions. It could, of course, simply be the case that financial development is correlated with general economic development and that the relationship between credit growth and pollution simply reflects a general increase in wealth.

However, the picture remains unchanged even when controlling for GDP per capita, a measure of a country's level of economic development. As before, deeper credit markets are associated with higher levels of pollution, while more developed stock markets are positive for the environment. In these estimations, carbon emissions start to decline at an annual income of around US\$ 40,000. This is in line with earlier estimates by Holtz-Eakin et al. (1995), who find a peak in CO₂ emissions at a per capita GDP of around US\$ 35,000.

Second, at sector level, we can compare the impact of financial development on relatively “dirty” versus relatively “clean” sectors. More specifically, pollution intensity can be measured as the amount of CO₂ emissions of a particular industry per unit of value added globally. Industries vary widely in terms of their inherent propensity to pollute (see Chart 8.6). The most polluting industries are energy generation, transport and the manufacturing of basic metals, while the manufacturing of transport equipment and construction are among the least polluting sectors globally.

Using data on industries' inherent tendency to pollute, one can test whether technologically dirty sectors produce higher CO₂ emissions than technologically clean sectors in countries with growing financial markets. Such an analysis reveals that industries that pollute relatively more for inherent, technological reasons generate relatively higher CO₂ emissions in countries with expanding credit markets. Importantly, stock markets have the exact opposite effect: industries that pollute relatively more for technology-related reasons produce relatively lower CO₂ emissions in countries with deepening stock markets.

Third, there are two main channels underpinning this relationship between financial development and environmental pollution. The first is cross-industry reallocation, whereby (holding technology constant) stock markets reallocate investment towards relatively clean industrial sectors while credit markets promote a reallocation of investment towards dirtier sectors. Another channel is intra-industry technological innovation, whereby (holding the industrial structure constant) industries adopt more efficient, cleaner technologies over time. Here, the data reveal declining levels of intra-industry technological innovation as credit markets develop. In particular, in countries with growing credit markets, dirty sectors post higher levels of CO₂ emissions per unit of value added than clean sectors. In countries with deepening stock markets, we see the opposite effect: pollution levels per unit of value added decline more in dirty sectors than in clean ones.

Fourth, greater green innovation in the dirtiest industries driven by stock-market development is reflected in patenting data. Background analysis shows that patenting activity in technologically dirty industries declines with credit-market development. This is the case both for total patents and for various green patent aggregates. At the same time, however, the number of green patents per capita increases faster in technologically dirty industries when stock markets grow. These results complement those of Hsu et al. (2014), which show that high-tech industries that depend on external finance are less likely to file patents in countries with better-developed credit markets and more likely to file patents in countries with better-developed stock markets. In sum, the ability of polluting industries to become greener through innovation depends on the relative development of credit and equity markets.

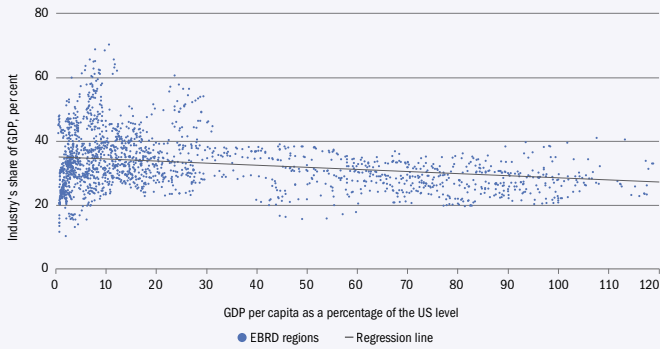


⁸ See Minetti (2011).

⁹ See Klassen and McLaughlin (1996).

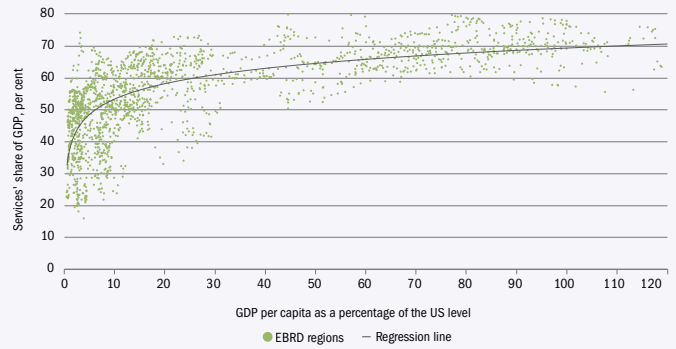
¹⁰ See De Haas and Popov (2018).

CHART 8.4. Industry's share of total value added first increases, then declines as per capita income rises



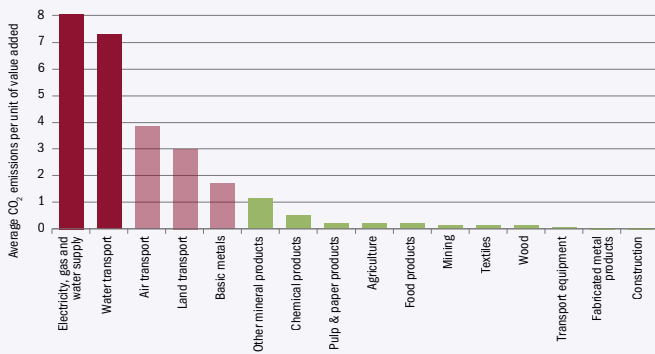
Source: World Bank and authors' calculations.

CHART 8.5. Services' share of total value added increases as per capita income rises



Source: World Bank and authors' calculations.

CHART 8.6. Pollution intensity varies greatly from industry to industry



Source: IEA, UNIDO and STAN.

Note: Pollution intensity denotes the average value, over the entire sample period, of each industry's CO₂ emissions per unit of value added in the global sample.

DEEPER CREDIT MARKETS ARE ASSOCIATED WITH HIGHER LEVELS OF POLLUTION, WHILE MORE DEVELOPED STOCK MARKETS ARE POSITIVE FOR THE ENVIRONMENT

THE ABILITY OF POLLUTING INDUSTRIES TO BECOME GREENER THROUGH INNOVATION DEPENDS ON THE RELATIVE DEVELOPMENT OF CREDIT AND EQUITY MARKETS



POLICY IMPLICATIONS

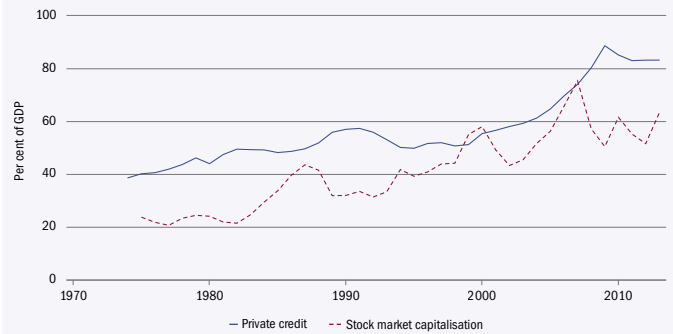
Recent research shows that financial development is, to a large extent, responsible for the inverse U-shape of the environmental Kuznets curve. Stock-market development strongly lags credit-market development over time (see Chart 8.7). The growth of credit markets is more gradual, while stock markets are prone to steep booms and busts. Stock-market capitalisation as a percentage of GDP has only overtaken credit (also expressed as a percentage of GDP) for brief periods: during the dotcom bubble of the 1990s and in the run-up to the global financial crisis of 2008-09. Because stock markets only catch up with credit markets at later stages of development, the pattern of financial development reinforces the non-linear relationship between economic development and environmental quality.

From a public policy perspective, this suggests that countries with bank-based financial systems that aim to “green” their economies by promoting green bonds or other green-finance initiatives should consider stimulating the development of conventional equity markets as well. This is particularly true for middle-income countries where CO₂ emissions tend to be highest and stock markets may remain relatively underdeveloped.

In parallel, countries can take measures to offset the continued tendency of credit markets to finance relatively dirty industries. For example, the green credit guidelines and resolutions that China and Brazil introduced in 2012 and 2014, respectively, encourage banks to improve their environmental and social performance and lend more to firms that are part of the low-carbon economy.

From a financial-industry perspective, adherence to risk-management frameworks that take green economy issues into account – for example, the Carbon Principles,¹¹ Climate Principles¹² and Equator Principles¹³ – should also contribute to a gradual “greening” of bank lending. Strict adherence to these principles could also make national climate-change policies more effective by accelerating the reallocation of capital and investment towards lower-carbon technologies.

CHART 8.7. Credit markets expanded faster than stock markets in 2000-15



Source: Beck et al. (2000, revised 2016).



**STOCK-MARKET
DEVELOPMENT
STRONGLY LAGS
CREDIT-MARKET
DEVELOPMENT
OVER TIME**

¹¹ The Carbon Principles are guidelines established by Citigroup Inc., JP Morgan Chase and Morgan Stanley for assessing the climate-change risks associated with power-generating financing.

¹² The Climate Principles set out a framework for reducing climate-change risks and the carbon footprint of the financial sector.

¹³ The Equator Principles provide a risk-management framework for financial institutions to determine, assess and manage environmental and social risk in project finance.

CONCLUSION

This report does not aim to provide a comprehensive overview of all of the issues related to economic development in middle-income economies. Indeed, it only touches on some of the challenges that these economies face in completing their transitions to high-income status and focuses specifically on the aspects of middle-income transitions that have changed over the years. While there is no evidence that the “middle-income trap” exists at a specific level of per capita income, middle-income transitions are challenging and often associated with lower growth in total factor productivity.

Our review of those economies that have performed best over several decades does not reveal a magic recipe for completing the middle-income transition. The geographic locations of the top performers are varied, as are the comparative advantages on which economies have been able to capitalise in the past. To paraphrase the opening line of Leo Tolstoy’s *Anna Karenina*, every middle-income economy is unhappy in its own way, with its unique challenges and obstacles to growth.

Yet several common themes emerge from our analysis. Having reached middle-income status, economies often need to adjust their economic development model. The new model typically needs to be more innovation-intensive. And as growth relies more on innovation, a healthy ecosystem of SMEs plays an increasingly important role in boosting economy-wide productivity. Consequently, growth in upper-middle-income economies depends more on improvements in the quality of the economic and political institutions.

Rethinking the development model also goes hand in hand with higher levels of investment in infrastructure, other physical capital and skills. These investments target the economy’s old capabilities and its new ones. The flipside of this investment requirement is a lower fraction of growth not attributable to increases in the stock of physical capital, human capital or labour. This results in lower growth being observed in total factor productivity at income levels between one-third and two-thirds that of the USA.

In this sense, the lessons learned from the successful middle-income transitions that started back in the early 1960s still apply: the importance of investment, domestic savings, skills and governance. In broad terms, economies in the EBRD regions tend to compare favourably with other economies at comparable levels of per capita income when it comes to skills and human capital. Yet they face a significant deficit when it comes to governance, in addition to major demographic headwinds.

Indeed, rapid changes in demographics and technology have been altering some of the policy priorities in middle-income economies. Over time, economic growth has become less

reliant on manufacturing. At the same time, technological change has increased the extent of economies’ specialisation in particular segments of the value chain. It has also made knowledge-intensive services more tradeable across borders.

Technological change has also placed issues related to the distribution of income at the core of the policy debate in middle-income economies. In the past, the rising tide of convergence successes tended to lift all boats, allowing economies to pursue successful convergence strategies with relatively weak social safety nets. Today, much like the advanced economies, emerging markets are using automation to produce goods and services more cost effectively, particularly in those countries where populations are ageing and labour forces have started to shrink. As a result, middle-income occupations that often involve routine or clerical tasks have become exposed to automation, while the typical working life has become much longer, highlighting the challenge of retaining and upgrading one’s skills.

The combination of technological and demographic change requires a rethink of social safety nets in middle-income economies, based on affording protection to individuals rather than jobs – including unemployment benefits, portable pensions and mid-career retraining opportunities for workers. Without such reforms, the rise of populist politicians may undermine economy-wide governance – the key ingredient of successful middle-income transitions.

Another new challenge faced by middle-income economies is burgeoning pollution. Middle-income economies tend to be more polluting per unit of GDP than both low-income and high-income countries, largely down to their industrial structures and, in part, their use of less advanced technologies than those found in advanced economies. To make middle-income transitions greener, it is crucial to create the right incentives for firms. Too often, however, middle-income economies are slow to phase out energy subsidies. As a result, their firms – and, in particular, their best-managed firms – are more polluting than they could be given best available technologies.

Middle-income economies’ high investment needs mean considerable demand for finance. Evidence strongly suggests that the structure of finance is of utmost importance to the success of middle-income transitions. Equity finance, specialised venture capital-type instruments supporting young and innovative firms, the development of local-currency finance and the swift resolution of any build-up of non-performing loans in the banking sector, in particular, help economies to initiate and sustain periods of exceptionally strong growth. Developed equity markets also make growth greener.

REFERENCES

- D. Acemoğlu, P. Aghion and F. Zilibotti (2006)** "Distance to Frontier, Selection, and Economic Growth", *Journal of the European Economic Association*, Vol. 4(1), pp. 37-74.
- P. Aghion (2017)** "Entrepreneurship and growth: lessons from an intellectual journey", *Small Business Economics*, Vol. 48(1), pp. 9-24.
- P. Aghion and C. Bircan (2017)** "The middle-income trap from a Schumpeterian perspective", EBRD Working Paper, London.
- P. Aghion, P. Howitt and D. Mayer-Foulkes (2005)** "The effect of financial development on convergence: Theory and evidence", *Quarterly Journal of Economics*, Vol. 120(1), pp. 173-222.
- P. Aghion, S. Guriev and K. Jo (forthcoming)** "Chaebols and firm dynamics in Korea", EBRD Working Paper, London.
- K. Akamatsu (1962)** "A historical pattern of economic growth in developing countries", *Journal of Developing Economies*, Vol. 1(1), pp. 3-25.
- U. Akcigit, H. Alp and M. Peters (2016)** "Lack of selection and limits to delegation: Firm dynamics in developing countries", National Bureau of Economic Research (NBER) Working Paper 21905, Cambridge, MA.
- T. Allen and C. Arkolakis (2014)** "Trade and the Topography of the Spatial Economy", *Quarterly Journal of Economics*, Vol. 129(3), pp. 1085-1140.
- D. Autor and D. Dorn (2013)** "The Growth of Low-Skilled Service Jobs and the Polarization of the U.S. Labor Market", *American Economic Review*, Vol. 103(5), pp. 1553-1597.
- R. Auty (1994)** "Industrial Policy Reform in Six Large Newly Industrializing Countries: The Resource Curse Thesis", *World Development*, Vol. 22(1), pp. 11-26.
- R. Azuero, M. Bosch and J. Torres (2017)** "Special Tax Regimes, Informality, and Productivity", Inter-American Development Bank, unpublished working paper, Washington, DC.
- R. Baldwin (2016)** *The great convergence: Information technology and the new globalization*, Harvard University Press, Cambridge, MA.
- M. Balgova, A. Plekhanov and M. Skrzypinska (2017)** "Reducing non-performing loans: Stylized facts and economic impact", EBRD Working Paper, London.
- A. Banerjee, E. Duflo and N. Qian (2012)** "On the Road: Access to Transportation Infrastructure and Economic Growth in China", NBER Working Paper No. 17897, Cambridge, MA.
- T. Beck, A. Demirgüç-Kunt and R. Levine (2000)** "A New Database on Financial Development and Structure", *World Bank Economic Review*, Vol. 14, pp. 597-605, Washington, DC.
- C. Bircan (forthcoming)** "Firm Dynamics and Productivity", EBRD Working Paper, London.
- N. Bloom, C. Genakos, R. Martin and R. Sadun (2010)** "Modern management: good for the environment or just hot air?", *Economic Journal*, Vol. 120 (544), pp. 551-572.
- N. Bloom, G. Fischer, I. Rasul, A. Rodriguez-Clare, T. Suri, C. Udry, E. Verhoogen, C. Woodruff and G. Zane (2014)** "Firm capabilities and economic growth", International Growth Centre Evidence Paper, London.
- G. Boyd and E. Curtis (2014)** "Evidence of an 'energy-management gap' in U. S. manufacturing: spillovers from firm management practices to energy efficiency", *Journal of Environmental Economics and Management*, Vol. 68(3), pp. 463-479.
- E. Brezis, P. Krugman and D. Tsiddon (1993)** "Leapfrogging in International Competition: A Theory of Cycles in National Technological Leadership", *American Economic Review*, Vol. 83(5), pp. 1211-1219.
- M. Bussolo, S. Commander and S. Poupakis (2018)** "Political Connections and Firms: Network Dimensions", World Bank Policy Research Working Paper 8428.
- H. Chang (2011)** *23 Things They Don't Tell You about Capitalism*, Reprint Edition, Penguin, London.
- M. Chinn and H. Ito (2006)** "What matters for financial development? Capital controls, institutions, and interactions", *Journal of Development Economics*, Vol. 81(1), pp. 163-192.
- D. Coady, I. Parry, L. Sears and B. Shang (2017)** "How large are global fossil fuel subsidies?", *World Development*, Vol. 91, pp. 11-27.
- J. Cortina, T. Didier and S. Schmukler (2017)** "Corporate debt maturity in developing countries: sources of long- and short-termism", World Bank Policy Research Working Paper 8222, Washington, DC.
- A.K. Coşar and B. Demir (2016)** "Domestic road infrastructure and international trade: Evidence from Turkey", *Journal of Development Economics*, Vol. 118, pp. 232-244.
- A.K. Coşar, B. Pakel and N. Young (forthcoming)** "Road capacity, domestic trade and regional outcomes", EBRD Working Paper, London.
- S. Davis, J. Haltiwanger and S. Schuh (1996)** "Small Business and Job Creation: Dissecting the Myth and Reassessing the Fact", *Small Business Economics*, Vol. 8(4), pp. 297-315.
- R. De Haas and N. van Horen (2017)** "Recent Trends in Cross-Border Banking in Europe", in B. Casu and T. Beck (eds.), *The Palgrave Handbook of European Banking*, pp. 475-497, Palgrave Macmillan, London.
- R. De Haas and A. Popov (2018)** "Financial Development and Industrial Pollution", EBRD Working Paper 217, London.
- Deloitte (2017)** *Rewriting the rules for the digital age: 2017 Deloitte Global Human Capital Trends*, Deloitte University Press.
- G. Duranton, P. Morrow and M. Turner (2014)** "Roads and Trade: Evidence from the US", *Review of Economic Studies*, 2014, vol. 81, issue 2, 681-724.
- EBRD (2013)** *Transition Report 2013 – Stuck in Transition?* London.
- EBRD (2014)** *Transition Report 2014 – Innovation in Transition*, London.
- EBRD (2016)** *Transition Report 2016-17 – Transition for all: Equal opportunities in an unequal world*, London.
- EBRD (2017)** *Transition Report 2017-18 – Sustaining Growth*, London.
- EBRD (2018)** *Transition Report 2018-19 – Work in transition*, London.
- B. Eichengreen, D. Perkins and K. Shin (2012)** *From Miracle to Maturity: The Growth of the Korean Economy*, Harvard University Press, Cambridge, MA.
- B. Eichengreen, D. Park and K. Shin (2015)** "The landscape of economic growth: Do middle-income countries differ?", Asian Development Bank Economics Working Paper 517, Mandaluyong, Metro Manila.
- European Commission (2014)** *Regional policy: Making Europe's regions and cities more competitive, fostering growth and creating jobs*, The European Union Explained series paper, Brussels.
- B. Faber (2014)** "Trade Integration, Market Size, and Industrialization: Evidence from China's National Trunk Highway System", *Review of Economic Studies*, Vol. 81(3), pp. 1046-1070.
- S. Fankhauser and R. Kotsch (2018)** "Growth opportunities in the low-carbon economy", Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics, background paper for the EBRD, London.
- C. Fons-Rosen, S. Kalemli-Ozcan, B. Sorensen, C. Villegas-Sanchez and V. Volosovych (2018, revised)** "Foreign Investment and Domestic Productivity: Identifying Knowledge Spillovers and Competition Effects", NBER Working Paper 23643, Cambridge, MA.

- GDH (2014)** Divided Highway Project, Republic of Turkey General Directorate of Highways, Ankara. See www.kgm.gov.tr/Sayfalar/KGM/SiteTr/Projeler/Projeler-BolunmusYol.aspx.
- I. Gill and H. Kharas (2007)** *An East Asian Renaissance: Ideas for Economic Growth*, World Bank Group, Washington, DC.
- C. Goldin and L. Katz (1998)** "The Origins of Technology-Skill Complementarity," *Quarterly Journal of Economics*, Vol. 113(3), pp. 693-732.
- E. Goni and W. Maloney (2017)** "Why don't poor countries do R&D? Varying rates of factor returns across the development process", *European Economic Review*, Vol. 94, pp. 126-147.
- M. Goos and A. Manning (2007)** "Lousy and Lovely Jobs: The Rising Polarization of Work in Britain," *Review of Economics and Statistics*, Vol. 89(1), pp. 118-133.
- Grand National Assembly of Turkey (2016)** Meeting records, dated 9 November 2016, available at "https://www.tbmm.gov.tr/develop/owa/komisyon_tutanaklari.mv_goruntule?pTutanakId=12993
- R. Griffith, S. Redding and J. Van Reenen (2004)** "Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Industries," *Review of Economics and Statistics*, Vol. 86(4), pp. 883-895.
- G. Grossman and A. Krueger (1995)** "Economic growth and the environment", *Quarterly Journal of Economics*, Vol. 110(2), pp. 353-377.
- S. Guriev, A. Plekhanov and K. Sonin (2012)** "Development Based on Commodity Revenues", in B. Munier (ed.), *Global Uncertainty and the Volatility of Agricultural Commodity Prices*, IOS Press, pp. 75-110, Amsterdam.
- O. Helmy (2015)** "Skill demand polarization in Egypt", *Middle East Development Journal*, Vol. 7(1), pp. 26-48.
- H. Hettige, M. Mani, and D. Wheeler (2000)** "Industrial pollution in economic development: The environmental Kuznets curve revisited", *Journal of Development Economics*, Vol. 62(2), pp. 445-476.
- D. Holtz-Eakin and T. Selden (1995)** "Stoking the fires? CO₂ emissions and economic growth", *Journal of Public Economics*, Vol. 57(1), pp. 85-101.
- K. Hong and A. Tornell (2005)** "Recovery from a Currency Crisis: Some Stylized Facts", *Journal of Development Economics*, Vol. 76(1), pp. 71-96.
- C. Hsieh and P. Klenow (2014)** "The Life Cycle of Plants in India and Mexico", *Quarterly Journal of Economics*, Vol. 129(3), pp. 1035-1084.
- P. Hsu, X. Tian and Y. Xu (2014)** "Financial development and innovation: Cross-country evidence", *Journal of Financial Economics*, Vol. 112(1), pp. 116-135.
- IDB (2018)** *A mandate to grow: 2018 Latin American and Caribbean Macroeconomic Report*, Inter-American Development Bank, Washington, DC.
- IDB, AfDB, ADB and EBRD (2018)** *The Future of Work: Regional Perspectives*, Washington, DC.
- IEA (2016)** *World Energy Balances 2017*, IEA/OECD Report and Statistics, Paris. See <https://www.iea.org/statistics/balances/>.
- IMF (2017a)** *World Economic Outlook*, Washington, DC.
- IMF (2017b)** *Fiscal Monitor*, Washington, DC.
- L. Karabarounis and B. Neiman (2014)** "The Global Decline of the Labor Share", *Quarterly Journal of Economics*, Vol. 129(1), pp. 61-103.
- L. Katz and A. Krueger (2016)** "The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015", NBER Working Paper 22667, Cambridge, MA.
- D. Kaufmann, A. Kraay and M. Mastruzzi (2009)** "Governance Matters VIII: Aggregate and Individual Governance Indicators for 1996-2008", World Bank Policy Research Working Paper 4978, Washington, DC.
- R. Klassen and C. McLaughlin (1996)** "The impact of environmental management on firm performance", *Management Science*, Vol. 42(8), pp. 1199-1214.
- P. Krugman (1994)** "The Myth of Asia's Miracle", *Foreign Affairs*, Vol. 73(6), pp. 62-76.
- J. Lee (2016)** "Korea's economic growth and catch-up: Implications for China", *China and World Economy*, Vol. 24(5), pp.71-97.
- J. Lee (2018)** "Convergence success and the middle-income trap", EBRD Working Paper 211, London.
- N. Limao and A. Venables (2001)** "Infrastructure, geographical disadvantage, transport costs, and trade", *World Bank Economic Review*, Vol. 15(3), pp. 451-479, Washington, DC.
- E. Lyubich, J. S. Shapiro and R. Walker (2018, revised)** "Regulating Mismeasured Pollution: Implications of Firm Heterogeneity for Environmental Policy", NBER Working Paper 24228, Cambridge, MA.
- R. Mano and M. Castillo (2015)** "The level of productivity in traded and non-traded sectors for a large panel of countries", IMF Working Paper 15/48.
- R. Martin (2019)** "Are clean technologies part of a sensible industrial strategy for Eastern Europe?" Imperial College London Working Paper, Forthcoming.
- R. Martin, M. Muuls, L. De Preux, U. J. Wagner (2012)** "Anatomy of a paradox: management practices, organisational structure and energy efficiency", *Journal of Environmental Economics and Management*, Vol. 63(2), pp. 208-223.
- P. Mauro (1995)** "Corruption and Growth", *Quarterly Journal of Economics*, Vol. 110(3), pp. 681-712.
- McKinsey Global Institute (2017)** *A future that works: Automation, employment and productivity*, McKinsey Global Institute.
- R. Minetti (2011)** "Informed finance and technological conservatism", *Review of Finance*, Vol. 15(3), pp. 633-692.
- OECD (2017a)** "Basic income as a policy option: Can it add up?", Policy Brief on the Future of Work, Paris.
- OECD (2017b)** *OECD Employment Outlook 2017*, OECD Publishing, Paris.
- A. Plekhanov and M. Stostad (2018)** "Modern growth in perspective: Relative performance since the global financial crisis", EBRD Working Paper 214, London.
- D. Rodrik (2016)** "Premature deindustrialization", *Journal of Economic Growth*, Vol 21(1). pp. 1-33.
- K. Rogoff (2016)** *The Curse of Cash*, Princeton University Press, Princeton, NJ.
- H. Schweiger and A. Stepanov (2018)** "Energy subsidies, energy intensity and management practices", EBRD Working Paper, London.
- M. Sposi, K. Yi and J. Zhang (2018)** "Accounting for Structural Change Over Time: A Case Study of Three Middle-Income Countries", Economic Dynamics Meeting Paper 1141.
- L. Tyson and L. Mendonca (2015)** "Worker Protection in the Gig Economy", *Project Syndicate*, 28 November 2015.
- P. Van Parijs and Y. Vanderborght (2017)** *Basic Income: A Radical Proposal for a Free Society and a Sane Economy*, Harvard University Press, Cambridge, MA.
- World Commission on Environment and Development (1987)** *Our Common Future*, Oxford University Press, Oxford, UK.
- World Resources Institute (2017)** CAIT Country GHC Emissions dataset (available at: cait.wri.org/historic).
- A. Young (1995)** "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience", *Quarterly Journal of Economics*, Vol. 110(3), pp. 641-680.

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