Perspectives on Global Development 2014

BOOSTING PRODUCTIVITY TO MEET THE MIDDLE-INCOME CHALLENGE

OECD DEVELOPMENT CENTRE

Perspectives on Global Development 2014

BOOSTING PRODUCTIVITY TO MEET THE MIDDLE-INCOME CHALLENGE

BETTER POLICIES FOR BETTER LIVES

Please cite this publication as:
OECD (2014), *Perspectives on Global Development 2014: Boosting Productivity to Meet the Middle-Income Challenge*, OECD Publishing.
http://dx.doi.org/10.1787/persp_glob_dev-2014-en

ISBN 978-92-64-21060-8 (print)
ISBN 978-92-64-21061-5 (PDF)

Series: Perspectives on Global Development
ISSN 2222-4467 (print)
ISSN 2222-4475 (online)

1. Note by Turkey:
The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Photo credits: Cover designed by the OECD Development Centre.
The front cover is based on Figure 1.1 in Chapter 1. The lines with some illustrative country icons represent the OECD's and non-OECD's share in world GDP in PPP terms. The shares crossed in 2010. The shaded areas in the bottom represent the shares of the BRIICS (from below: Brazil, China, India, Indonesia, the Russian Federation and South Africa).

Corrigenda to OECD publications may be found on line at: *www.oecd.org/about/publishing/corrigenda.htm*.

Foreword

Developing economies continue to grow faster than more advanced countries. In 2010, non-OECD countries' share in world GDP surpassed that of OECD countries. Since its initiation in 2010, the series of publications Perspectives on Global Development *has investigated the trends in the "shifting wealth" process, following the increasing economic weight of developing countries in the world economy. "Shifting wealth" has received a particular boost through the rise of People's Republic of China, which has also led to positive spillover effects on other developing economies that could supply China's emerging demand for resource-based products and intermediates. However, assuming that trend growth remains the same in the coming decades, the recently accelerated convergence process of developing with developed country incomes is not sufficient for many countries (including many middle-income countries) to reach OECD average incomes by 2050.*

The 2014 edition of Perspectives on Global Development *therefore investigates whether convergence will continue. It argues that for sustained convergence developing countries need to boost competitiveness and narrow their significant productivity gap with advanced economies. The report identifies ways through which countries can boost productivity and sustain development. These are not mutually exclusive so countries can make improvements in different areas at the same time, and they are often interlinked. Moreover, some countries have greater opportunities and possibilities than others in some areas depending on their specific conditions and capabilities.*

Whether there will continue to be a trend towards convergence between OECD and non-OECD countries depends to a large extent on the performance of the BRIICS (Brazil, the Russian Federation, India, Indonesia, China and South Africa) – given the size and growth performance of their economies, the size of their populations and the spillover effects their development may induce on other developing and developed countries. Therefore, the report also provides a broader overview of their challenges as well as their prospects to sustainably move beyond the middle-income level. Moreover, the report places emphasis on the increasingly important role of services to foster growth and to boost competitiveness. It also shows the potential for regional development policies as a further means of enhancing competitiveness.

The report examines productivity at the macro level to identify its contribution to overall economic growth, but also at a more detailed level for up to 18 manufacturing and 16 service sectors in 40 countries. A special feature of the report is that it also studies productivity, technical efficiency and mark-ups at the firm level for nine countries – the BRIICS plus Columbia, Cameroon and Senegal.

Acknowledgements

The 2014 edition of OECD's *Perspectives on Global Development* was prepared by the OECD Development Centre under the direction of Mario Pezzini, Director of the OECD Development Centre. The team was led by Margit Molnar, Head of Competitiveness and Structural Analysis Unit, under the supervision of Carl Dahlman, Head of Global Research and Thematic Division. The report was drafted by Margit Molnar, Martin Wermelinger, Derek Carnegie, and Edouard Turkisch. Significant inputs into the chapters were provided by Alexa Tiemann, Martha Baxter, and Flora Vever. Significant inputs to the analytical work were provided by Jingjing Xia, Miklos Farkas and Jerry Weng. Statistical assistance was provided by Vararat Atisophon and administrative support by Myriam Andrieux. Ken Kincaid, Charles Pigott, Roberta Bensky and Martha Baxter edited the publication and the OECD Development Centre's publication team, in particular Elizabeth Nash and Gemma Nellies, turned the draft into a publication.

The authors are grateful for insightful comments by the participants in the experts meeting, in alphabetical order, Rudiger Ahrend (Head of Unit, OECD), Christophe Destais (Deputy Director, CEPII, France), Peter Jarrett (Head of Division, OECD), Alexander Klein (Senior Development Economist, Deutsche Investitions- und Entwicklungsgesellschaft mbH), Henk L.M. Kox (Partner, KVL Economic Policy Research, Den Bosch, Netherlands), Sebastian Miroudot (Senior Trade Policy Analyst, OECD), Fernanda De Negri (Director, IPEA, Brazil), Joaquim Oliveira-Martins (Head of Division, OECD), Patrick Salez (former European Commission Officer), Prof. Carlos E. Sepulveda (Universidad del Rosario, Bogota, Colombia), Alain de Serres (Head of Division, OECD), Wang Wei (Vice Director, Development Research Center of the State Council, China), Nimrod Zalk (Industrial Development Policy and Strategy Advisor, Department of Trade and Industry, South Africa).

Moreover, the report benefitted from helpful comments on later drafts from Sonia Araujo (Economist, OECD), Jorge Arbache (BNDES), Jens Arnold (Senior Economist, OECD), Lilas Demmou (Economist, OECD), Richard Dutu (Economist, OECD), Simon Evenett (University of St. Gallen and CEPR), Jose Augusto Fernandes (CNI), Joao Carlos Ferraz (BNDES), Peter Gal (Economist, OECD), Jens Høj (Senior Economist, OECD), Anna Jankowska (Economist, OECD), Vincent Koen (Head of Division, OECD), Alexandre Kolev (Senior Economist, OECD), Yevgeny Kuznetsov (Migration Policy Institute), Sebastian Nieto Parra (Economist, OECD), Jose Ramon Perea (Economist, OECD), Charles Pigott (former Senior Economist, OECD), Dirk Pilat (Deputy Director, OECD), Annalisa Primi (Senior Economist, OECD), Artur Radziwill (Senior Economist, OECD), Jan Rieländer (Senior Economist, OECD), Vicente Ruiz (Economist, OECD), Petar Vujanovic (Senior Economist, OECD) and Andreas Wörgötter (Head of Division, OECD).

Special thanks go to Fernanda De Negri and Alexandre Messa Peixoto da Silva from IPEA, Brazil, Prof. Carlos E. Sepulveda and Juan Miguel Gallego from the Universidad del Rosario, Bogota, Colombia for their co-operation in terms of information sharing and support to run estimation programmes on non-publically available firm-level datasets in their countries.

The Development Centre gratefully acknowledges financial support from its members and additional contributions from the Government of Switzerland for this report.

Table of contents

Tables

Figures

Follow OECD Publications on:

http://twitter.com/OECD_Pubs

http://www.facebook.com/OECDPublications

http://www.linkedin.com/groups/OECD-Publications-4645871

http://www.youtube.com/oecdilibrary

http://www.oecd.org/oecddirect/

This book has...

StatLinks

A service that delivers Excel® files from the printed page!

Look for the *StatLinks* at the bottom of the tables or graphs in this book. To download the matching Excel® spreadsheet, just type the link into your Internet browser, starting with the *http://dx.doi.org* prefix, or click on the link from the e-book edition.

Acronyms and abbreviations

ADB	Asian Development Bank
AfDB	African Development Bank
BEE	Indian Bureau of Energy Efficiency
BKPM	Indonesia Investment Coordinating Board
BOS	School Operations Fund
BPO	Business Process Outsourcing
BRIICS	Brazil, Russian Federation, India, Indonesia, China and South Africa
CAGR	Compound Annual Growth Rate
CGSs	Credit Guarantee Schemes
DEA	Data Envelopment Analysis
DEG	German Investment Corporation
EBRD	European Bank for Reconstruction and Development
ECA	Economic Commission for Africa (United Nations)
ECLAC	Economic Commission for Latin America (United Nations)
EPL	Employment Protection Legislation
EPZs	Export Processing Zones
EITI	Extractive Industries Transparency Initiative
EWI	East-West Interaction
FDI	Foreign Direct Investment
FISIM	Financial Intermediation Services Indirectly Measured Method
FTAs	Free-Trade Agreements
FTZs	Free Trade Zones
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
HCI	Heavy Chemical Industry, Korea
HHA	Hand in Hand Aid
ICOR	Incremental Capital-Output Ratio
ICT	Information and Communications Technology
IDE-JETRO	Institute of Developing Economies – Japan External Trade Organization
IEA	International Energy Agency
IFC	International Finance Corporation (World Bank group)
IIGF	Indonesia Investment Guarantee Fund
ILO	International Labour Organization
IMF	International Monetary Fund
IPR	Intellectual Property Rights
ISIC	International Standard Industrial Classification of All Economic Activities
KILM	Key Indicators of the Labour Market
LDC	Least Developed Country

NASSCOM	National Association of Software and Services Companies, India
NDIC	National Development and Innovation Commission, Mongolia
NDRC	National Development and Reform Commission, China
NGOs	Non-Governmental Organisations
NREGA	National Rural Employment Guarantee Scheme
MCT	Ministry of Science and Technology, Brazil
OCAD	Órganos Colegiados de Administración y Decisión
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
OPEC	Organization of the Petroleum Exporting Countries
OSS	One Stop Services
PISA	Programme for International Student Assessment
PPA	Pluriannual Planning Programme, Brazil
PPP	Purchasing Power Parity
R&D	Research and Development
RCA	Revealed Comparative Advantages
SEZs	Special Economic Zones
SITC	Standard International Trade Classification
SMEs	Small and Medium-sized Enterprises
SOEs	State-Owned Enterprises
STRI	Services Trade Restrictiveness Index
TFP	Total Factor Productivity
TiVA	Trade in Value-Added
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
VAE	Validation des Acquis de l'Expérience, France
VAP	Validation des Acquis Professionnels, France
VET	Vocational Education and Training
WDI	World Development Indicators
WDS	Western Development Strategy
WIOD	World Input-Output Database
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Editorial

This fourth report in our series on "shifting wealth" raises the question of whether convergence in the living standards of emerging-market economies and developing countries to the level of advanced economies will continue in the years to come. Although convergence implies much more than economic growth, the dynamism of emerging-market economies has been an important driver in gradually bridging the living standards gap. In 2010, the share of global GDP of non-OECD countries in PPP terms surpassed that of OECD countries. This change in relative economic size is being led by China and India, which together already account for almost one quarter of global GDP in PPP. However, the differential rate of economic growth between OECD and non-OECD countries has narrowed recently and there has been a significant slowdown in the rate of growth of emerging-market economies. Boosting productivity growth in middle-income countries could stem this trend and is the focus of this report. At the same time, this growth needs to be inclusive, so a real convergence in living standards can take place.

Productivity levels in middle-income countries are still very low compared to the OECD average. The gap is even widening in some countries as there has been a slowdown in their productivity growth. There are many ways to improve productivity to boost growth. In earlier stages of development, these include mainly shifting labour from low to higher productivity activities, and more intensive use of both capital and labour. While in many middle-income countries these initial productivity drivers continue to be important, boosting productivity through technological catch-up, as well as developing more effective ways to produce and deliver goods and services becomes more important.

Another challenge is that the commodity boom fuelled by demand from China and India, which together now account for almost one quarter of global raw material imports, has led to a greater degree of specialisation in natural resource-based exports in some developing countries. This specialisation can be an opportunity to exploit domestic resources, but it can also be a challenge, because it can make the development of skills, the flexibility of the economy to move into higher value areas and the potential for growth in new sectors more difficult.

Countries therefore need to make greater efforts to diversify their economic structure towards higher value activities. To do this they have to increase the levels of educational attainment and skills of their labour force and improve their capability to innovate – to produce goods and services that are new to the economy. They can do the latter by importing new ways of producing and distributing goods and services, as well as by developing their own which can better suit their specific conditions or give them a competitive edge in the international market. There are also opportunities to boost growth and productivity in the economy by promoting knowledge intensive services, advancing better regulation and competition policies, improving capital and labour markets, and facilitating a more effective integration into global value chains.

This report pays special attention to the so-called BRIICS (Brazil, Russia, India, Indonesia, China, South Africa). They account for nearly 60% of the share of developing and emerging countries in global GDP in PPP terms and also have an important indirect effect on the global economy through their trade and investment linkages. They have followed diverse development paths and face very different challenges and opportunities because of the specifics of their economies and past strategies. Given the diversity of their experiences some of the challenges and possible ways forward may also be of interest to other developing countries as they craft their own development strategies.

One final aspect that this publication underlines is the important reminder that development goes beyond mere economic growth: it needs to be both inclusive and sustainable. The social unrest of the Arab Spring as well as some of the rising social tensions in other developing economies make clear that more attention has to be paid to social cohesion and equality of opportunity, so the benefits of economic development are shared more broadly. The problems of environmental damage caused by growth also raise issues of environmental sustainability. The most effective combination of policies will depend on the specifics of each country as well as the capability of its governments not only to develop but also to implement the strategies.

The OECD is committed to promoting development worldwide with a focus on economic growth, social cohesion and environmental sustainability. This report contributes greatly to advance this objective, underscoring our Organisation's readiness to continue supporting emerging and developing countries in their efforts to innovate, redesign, and implement better policies for better lives.

Angel Gurría

Secretary General

Executive summary

Many middle-income countries are not on course to converge with OECD per capita incomes: Strong growth over much of the past decade has substantially boosted developing countries' share of the global economy. But will this process of "shifting wealth" allow these countries to eventually converge with the average OECD per capita income level? After a long period of impressive progress, growth rates have begun slowing in some middle-income economies. At average growth rates over 2000-12 several middle-income countries will fail to converge with the average OECD income level by 2050. Their challenge is deepened by the slowdown in China, where rapid growth has up to now benefited its neighbours and suppliers, in particular natural-resource exporters.

Productivity growth is key: During the transition away from being a low-income economy, productivity is boosted by shifting labour from lower to higher productivity sectors. This shift can continue to be an important factor even in middle-income countries, for example India and Indonesia. But once this process slows down, the focus needs to turn increasingly to productivity gains *within* sectors. This shift is evident in overall productivity growth in OECD countries. It is also evident in China, which has raised productivity in many manufacturing industries by tapping global knowledge through foreign direct investment and by importing capital goods and components.

But productivity is rising only slowly: For sustained convergence, productivity growth needs to accelerate. Over the past decade, productivity growth made only a marginal contribution to economic growth in many middle-income countries. It was also insufficient to significantly reduce the very large gap in productivity with advanced countries. In Brazil, Mexico and Turkey, the gap even widened. By contrast, China recorded impressive growth in productivity: around 10% annually in labour productivity and above 7% in total factor productivity in manufacturing and services. India also experienced considerable total factor productivity growth over the past decade, although the gap between it and advanced economies remains substantial.

Some traditional drivers of growth are fading: Improving productivity is especially important as many middle-income countries can no longer rely on the advantages that lower-income economies usually enjoy as they move up to middle-income status. These include low labour costs and fast growth driven by foreign investment-led development of export industries. Moreover, the demographics in middle-income countries become less favourable to growth. The rise to middle-income status is often accelerated by a demographic transition where mortality rates fall faster than birth rates, so increasing the supply of working-age people. Some regions still have the potential to reap this demographic dividend, notably South Asia and sub-Saharan Africa. But elsewhere the demographic dividend is fading.

Middle-income economies can boost productivity by:

- **Diversifying continuously into higher value-added sectors in agriculture, industry and services:** Diversification is particularly important in middle-income countries that are seeing rising wages, as well as those rich in natural resources.
- **Innovating by using global knowledge and developing domestic capabilities:** Even the more advanced middle-income countries still have significant room for technological catch-up. Besides better integration into the global trading system and tapping foreign knowledge through trade, foreign direct investment and other means, countries also need to develop capabilities to innovate new products and processes to better suit their own needs and create their own competitive edges.
- **Reforming product, labour and financial markets, and developing skills:** In many middle-income countries, the development of competitive, innovative businesses is often constrained by an inadequate regulatory environment and lack of skills.
- **Fostering competitive service sectors:** The domestic service sector can grow to meet the demand of the growing middle classes. Services can also increase the competitiveness of manufacturing and be a source of export earnings.

They can also continue to exploit "old" drivers of growth by:

- **Shifting labour from lower to higher productivity sectors:** Many middle-income countries, including India, Indonesia, Iran and Malaysia, still have potential to benefit from workers in agriculture, manufacturing and services making the move up to higher productivity sectors.
- **Fully reaping factor accumulation-led growth:** Most middle-income countries still have room for improvement in how they use labour and can further accumulate human and physical capital. Also, efficiency in the use of production factors can be improved.

They can work to spread the benefits of growth by:

- **Ensuring equal opportunities:** In many middle-income countries, poverty is still widespread and/or income inequality has risen during the last decade. Frustrations among the "middle classes" over living standards and their lack of a say in decision making have created tensions in some middle-income economies. These social challenges need to be addressed by providing better public goods, improving people's quality of life, providing more job opportunities and ensuring a greater voice in the economy.
- **Developing effective regional policies to support more equitable growth and reduce regional disparities:** This requires identifying regional competitive edges and tailoring public services to local needs with priorities to heavily populated poor areas.
- **Increasing energy efficiency and environmental sustainability:** Diversifying into less energy-intensive sectors and adopting energy-efficient technologies would reduce vulnerability to fluctuations in energy prices and changes in regulations and preferences. In addition, more attention has to be paid to environmental sustainability in crafting successful development strategies.

And they can make government more effective by:

- **Developing greater capability to formulate and implement plans:** Better training of government officials and improved co-ordination across government ministries is essential to ensure effective planning and implementation. Bold changes in strategies may be politically difficult and costly though less so than no change. Effective communication strategies and the right timing and sequencing are critical to obtain support by multiple stakeholders to implement these reforms.

Chapter 1

Shifting wealth and the productivity challenges for middle-income countries*

The chapter begins with an update on recent trends in "shifting wealth", examining global growth, trade and investment. The second section discusses the convergence prospects for middle-income countries and highlights the important role of productivity growth in boosting these prospects. This section also looks at trends in total factor productivity (TFP) and labour productivity for manufacturing and services in selected middle-income economies, summarising more detailed analyses found in later chapters. The following section examines the traditional drivers of growth that may be starting to fade in middle-income countries. The final section of the chapter provides a roadmap for the rest of the report and summarises key considerations for boosting productivity and supporting development.

* The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Emerging and developing countries continue to grow faster than advanced countries so the process of "shifting wealth" continues. "Shifting wealth" has received a particular boost through the rise of the People's Republic of China and, to a smaller extent, India, which has also led to positive spillover effects on other developing economies that could supply those countries' emerging demand for resource-based products and intermediates. This chapter begins by exploring recent trends in "shifting wealth", discussing the growing share of non-OECD countries in terms of global GDP and trade and investment flows.

Given the "shifting wealth" trends, the chapter then examines whether middle-income countries are growing fast enough for their per capita incomes to converge with those of OECD countries, and finds that many middle-income countries would need to accelerate growth if they are to converge with average OECD income levels in the next couple of decades. Recognising the connection between growth and productivity, the chapter then benchmarks middle-income countries' productivity growth and levels against each other and against more advanced economies. It finds that productivity levels in middle-income countries are still very low compared to advanced country levels, and the gap is even growing in some countries as there has been a slowdown in their productivity growth.

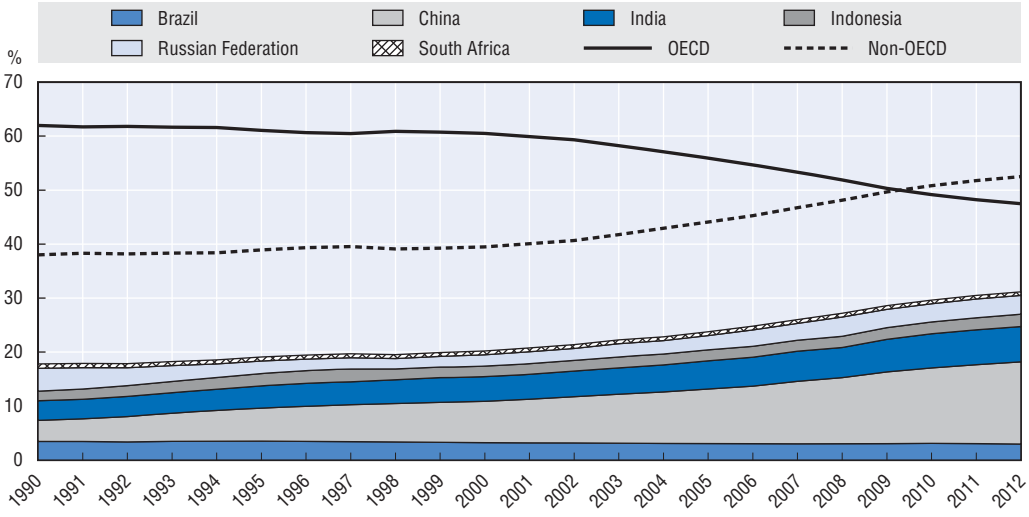
The next section points out that some of the traditional drivers of growth and productivity are fading in some middle-income countries and highlights that new ways to boost productivity need to be identified. The final section of the chapter provides the roadmap for the remainder of the report and a summary of key considerations for boosting productivity and supporting development in middle-income countries.

Shifting global economic landscape

Since the early 2000s, non-OECD countries' share of global GDP has been rising and in 2010 they overtook OECD economies in terms of their share of global GDP in Purchasing Power Parity (PPP) (Figure 1.1). "Shifting wealth" refers to this shift of the concentration of global economic activity. Although this shift is being tracked by changes in GDP, which is a flow concept, it is indicative of changes in wealth, a stock concept, which will only be seen later in time. The shift is in large part due to the growth in the BRIICS countries, in particular China. The difference in GDP growth rates between advanced countries and emerging and developing countries began to rise surely and steadily in the 2000s, peaking in 2009 during the financial crisis when advanced economies contracted by 3.4% and emerging and developing economies posted 3.5% growth (Figure 1.2). Since then, the difference in growth rates has been narrowing and it is not clear what the future trend will be.

Figure 1.1. **Non-OECD countries' share in the global economy has been steadily rising**

Share of GDP in PPP terms

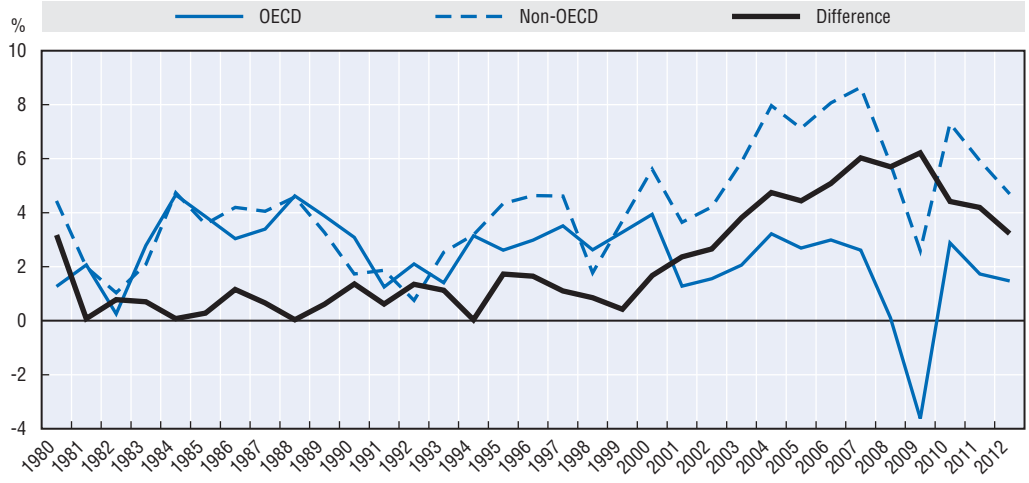


Source: Authors' calculations based on World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933057419

Figure 1.2. **The difference in growth rates between advanced economies and emerging and developing economies has been narrowing since 2009**

Real GDP growth (annual % change) and difference in growth rates



Source: Authors' calculations based on World Bank (2013), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933057438

On the cyclical side, since 2008 developing countries have benefitted from historically low interest rates as developed countries lowered interest rates and adopted extraordinary measures to expand credit (such as quantitative easing in the United States). These low rates plus foreign direct investment and portfolio flows from developed countries to more attractive developing country markets also helped their growth. However, the tapering of the quantitative easing in the United States as the economy recovers and interest rates

begin to rise is leading to an outflow of portfolio flows from emerging and developing countries. These outflows and rising interest rates will negatively affect the future growth prospects of developing countries that depend on foreign capital – virtually all but China, which is a net capital exporter (IMF, 2014a).

On the structural side, the overall shift of the concentration of economic activity from west to east has lifted the economic performance of many countries. Countries at all income levels and in all geographical locations have been impacted by this phenomenon. For some, it has meant advancing to higher income brackets, while for others, an end to long-time sluggish growth. This "shifting wealth" phenomenon has also changed the patterns of growth in many countries. Countries in geographic proximity to China or those exporting natural resources that China is in great need of were more directly affected through surging demand, while others were affected more indirectly through price effects. China's great appetite for agricultural goods, minerals and other natural resources, its demand for parts and components related to the reshaping of global value chains, and the increasing global prices of commodities became key engines of growth in many countries in the past decade. This past bonanza, however, is set to fade gradually, as China's growth slows and the energy- and carbon-intensity of growth declines. Thus, the "shifting wealth" from the rise of China will likely play a smaller role in lifting performances of commodity producers and exporters of parts and components in the future, thereby posing additional challenges for catching-up economies.

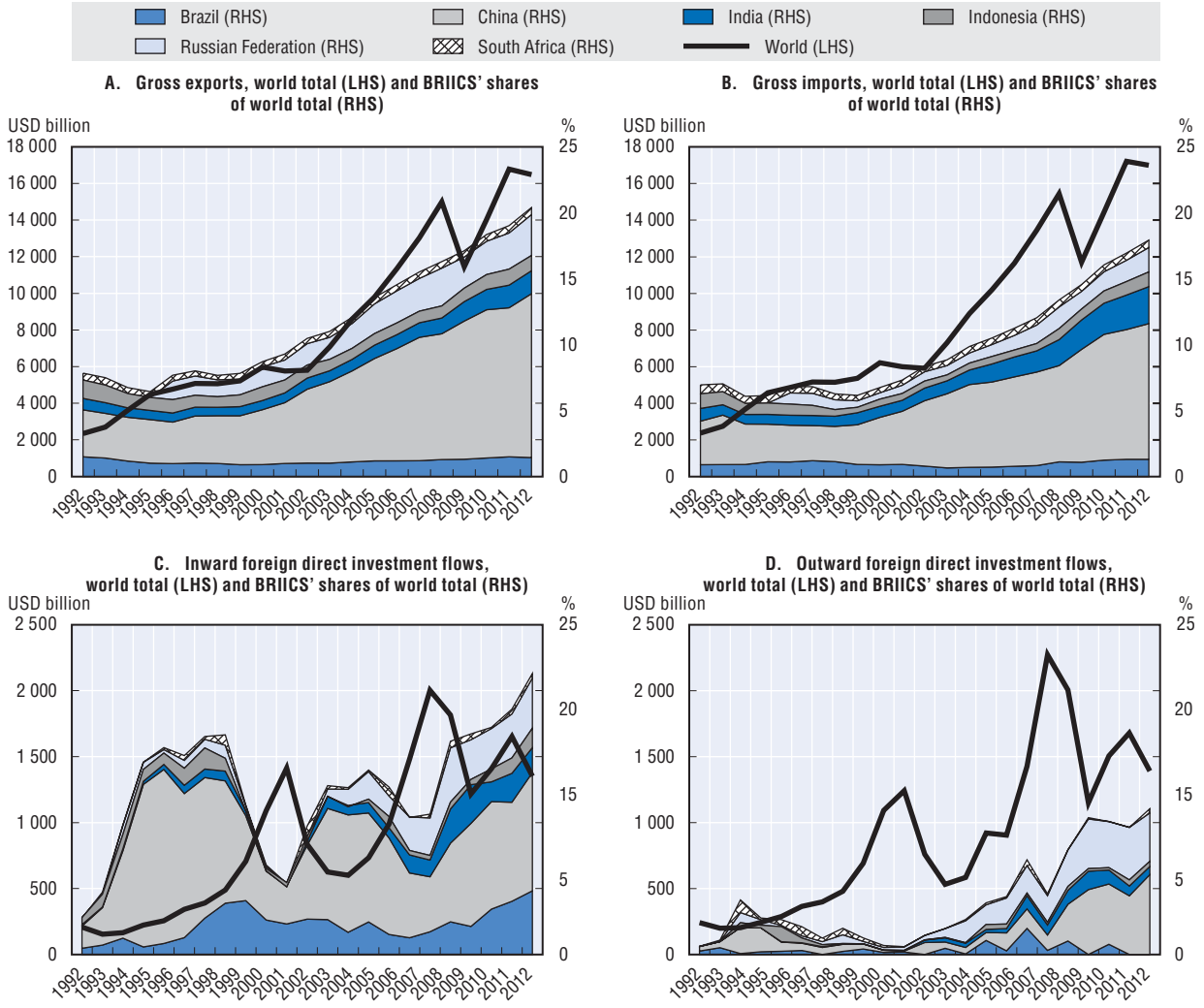
The impact of "shifting wealth" on other countries – through the channels of trade, investment, financial and knowledge flows – has been shaped by the combination of the type of their endowments and the strategies adopted to integrate into the global economy (OECD, 2013). The challenges countries face and their potential arsenal of policy tools also hinge upon the combination of these factors.

BRIICS countries have been increasing their share of global trade and investment, led by China

The shifting economic weight in the global economy has seen the BRIICS countries increase their share of global trade and investment (Figure 1.3). All BRIICS countries except Indonesia increased their share of global exports between 2000 and 2012 and now account for over a fifth of global exports (Figure 1.3, Panel A). The BRIICS also doubled their share of global imports between 2000 and 2012 and now account for 18% of the global total (Figure 1.3, Panel B). Foreign direct investment (FDI) flows into the BRIICS also increased in the 2000s (Figure 1.3, Panel C) and later in the decade the BRIICS themselves became an important source of FDI: in 2000, FDI outflows from the BRIICS were extremely low – representing less than 1% of the world total – but by 2012 had increased to more than 10% of the world total, with China and the Russian Federation leading the pack (Figure 1.3, Panel D).

Of all of the BRIICS, it is China that has seen the most dramatic changes in these trends. China is commanding an increasing share of world trade and investment flows. Its share in global merchandise as well as services trade has been increasing unabated. It has become the world's largest exporter. The growth of China fuelled insatiable demand for agricultural and other raw materials, minerals and hydrocarbons, including inputs used for the production of capital goods and construction materials. In particular, China has become the world's largest importer of raw materials: its raw materials imports as a share of the world total has quadrupled from just under 4% in 2000 to nearly 16% in 2012, which together with India accounts for nearly a quarter of global raw material imports

Figure 1.3. **BRIICS countries have been increasing their share of global trade and investment**



Source: Authors' calculations based on UN Comtrade (2014), *United Nations Commodity Trade Statistics* (database), *http://comtrade.un.org/db/default.aspx* for Panels A and B; UNCTAD (2013), *UnctadStat* (database), *http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx* for Panels C and D.

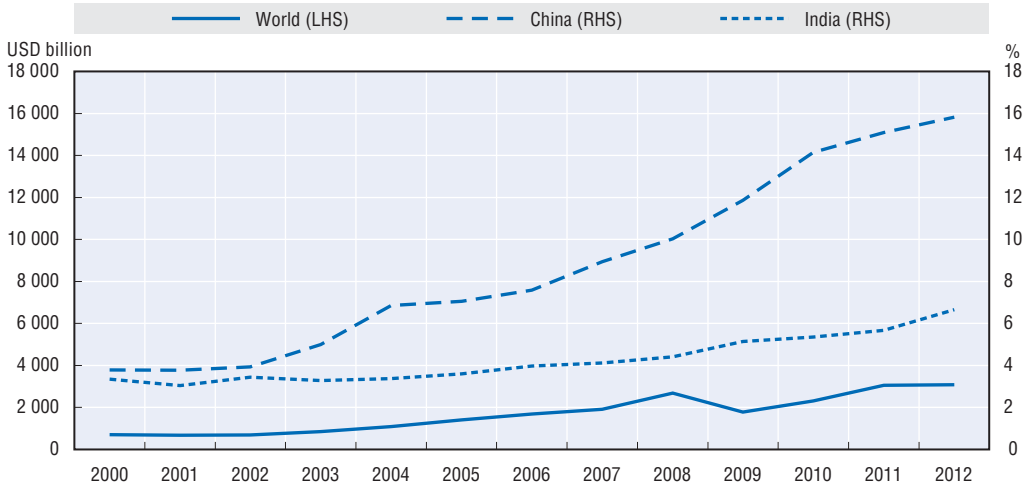
StatLink http://dx.doi.org/10.1787/888933057457

(Figure 1.4).[1] China's appetite has been particularly great for metals: it has become the largest single importer of several metals, commanding 80% of world nickel imports, 65% of lead imports, 62% of manganese ore imports and 40% of global copper imports in 2010, along with substantial portions of world imports of other metals. Also, simple manufactures of resources are increasingly demanded in China. The share of imports of resource-based products (such as pipes and glass) together with primary goods imports increased from under 4% of world imports in 2000 to around 11% in 2012.

Countries that are rich in natural resources of great need to China have enjoyed rising terms of trade, increasing exports and improving current account balances, but have also seen their manufacturing competitiveness challenged. The booms in the commodities sectors have often boosted demand in other sectors and pushed up wages, which in turn have spilled over to other sectors that have not experienced the productivity gains that would justify wage increases. This has sometimes led to a loss of competitiveness of manufacturing exports and de-industrialisation (see Chapters 2 and 6).

Figure 1.4. **China and India's raw material imports have been increasing**

Raw material imports and China's and India's shares, 2000-12



Note: Raw material is defined as the sum of the categories of A, B and C in ISIC Rev.3 where A. is Agriculture, hunting and forestry; B. is Fishing and C. is Mining and quarrying.

Source: Authors' calculations based on UN Comtrade (2014), *United Nations Commodity Trade Statistics* (database), *http://comtrade.un.org/db/default.aspx*.

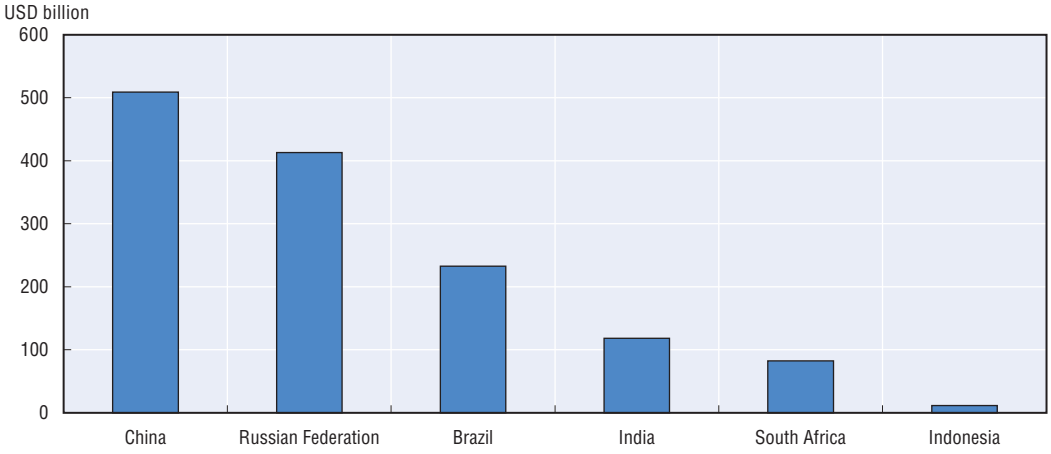
StatLink http://dx.doi.org/10.1787/888933057476

Countries that share supply chains with China are benefiting from an ever-increasing demand for their exports but have also been facing increasing competitive pressure as China has been entering into the production of an ever-widening range of goods. This has led to a shift in the pattern of Asian supply chains from a Japan-centred to China-centred pattern. The major beneficiaries of this shift are countries that participate in highly sliceable supply chains, such as in electronics industries, and are located in the Asian region. Low tariffs and moderate service link costs are prerequisites for participation in international supply chains. Agreements fostering economic co-operation across countries such as free-trade agreements (FTAs) may accelerate the integration into such value chains. Economies integrated into supply chains typically exhibit a flat tariff structure with relatively little tariff escalation, reflecting low effective protection at the industry level.

The share of China in world outward investment has increased rapidly over the last decade and is the largest among the BRIICS (Figure 1.5). However, as this is a relatively recent phenomenon, its outward FDI stocks still remain a very small share of global stocks at just 2%. Its outward investment is mainly flowing into business services, followed by finance, mining, wholesale and retail trade and manufacturing. Many mineral-rich countries, in particular Peru, South Africa and Zambia, benefited from Chinese capital, including equity and FDI in the mining sector, upgrading of the infrastructure sector and more recently capital flows into other sectors. Hydrocarbon-abundant countries have also received large Chinese investments in their resource sectors. Such investments were led by state-owned firms acquiring stakes in oil fields in various parts of the world. Acquisitions, however, have not been limited to upstream industries; filling stations and processing industries also benefited from Chinese capital. In addition, many resource-rich countries established joint production facilities in China, building on joint comparative advantages. They are less measurable, but Chinese provision of infrastructure, co-extraction of resources and other FDI have likely been generating substantial knowledge flows to resource-rich developing countries.

Figure 1.5. **China has the largest stocks of outward foreign direct investment among the BRIICS**

Outward foreign direct investment (FDI) stocks from the BRIICS, 2012



Source: UNCTAD (2013), *UnctadStat* (database), *http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx*.

StatLink http://dx.doi.org/10.1787/888933057495

The impact of China's growth deceleration on other countries will be further affected by changes in the nature of its growth. These changes include a reduced energy intensity of production as a result of increased efficiency consciousness driven by China's now large energy-intensity gap relative to OECD countries. This gap reflects the bias in China's industry towards more energy-intensive sectors and a greater intensity in the use of energy across industries. The composition of China's growth is expected to shift gradually in the medium term from investment- and export-led growth to a pattern more based on consumption. The composition of investment is also expected to shift. The share of business capital investment, which is heavily intensive in the use of steel, will decrease due to overcapacity in many manufacturing industries while infrastructure and real estate investment are expected to increase.

Alternatives to China as potential drivers of "shifting wealth" are emerging

A crucial issue is whether growth in China will decelerate. If this were the case, can growth in other large and converging economies make up for the difference and thus help to maintain global growth performance? Both the large weight of China in the global economy and its exceptionally rapid growth over the past decade or so imply that no single other country is likely to be able to have an impact of similar magnitude on the global economy. The other BRIICS together with a number of other large economies could collectively have an impact comparable to that of China as potential drivers of global growth, but only if they were to achieve similarly impressive growth performances.

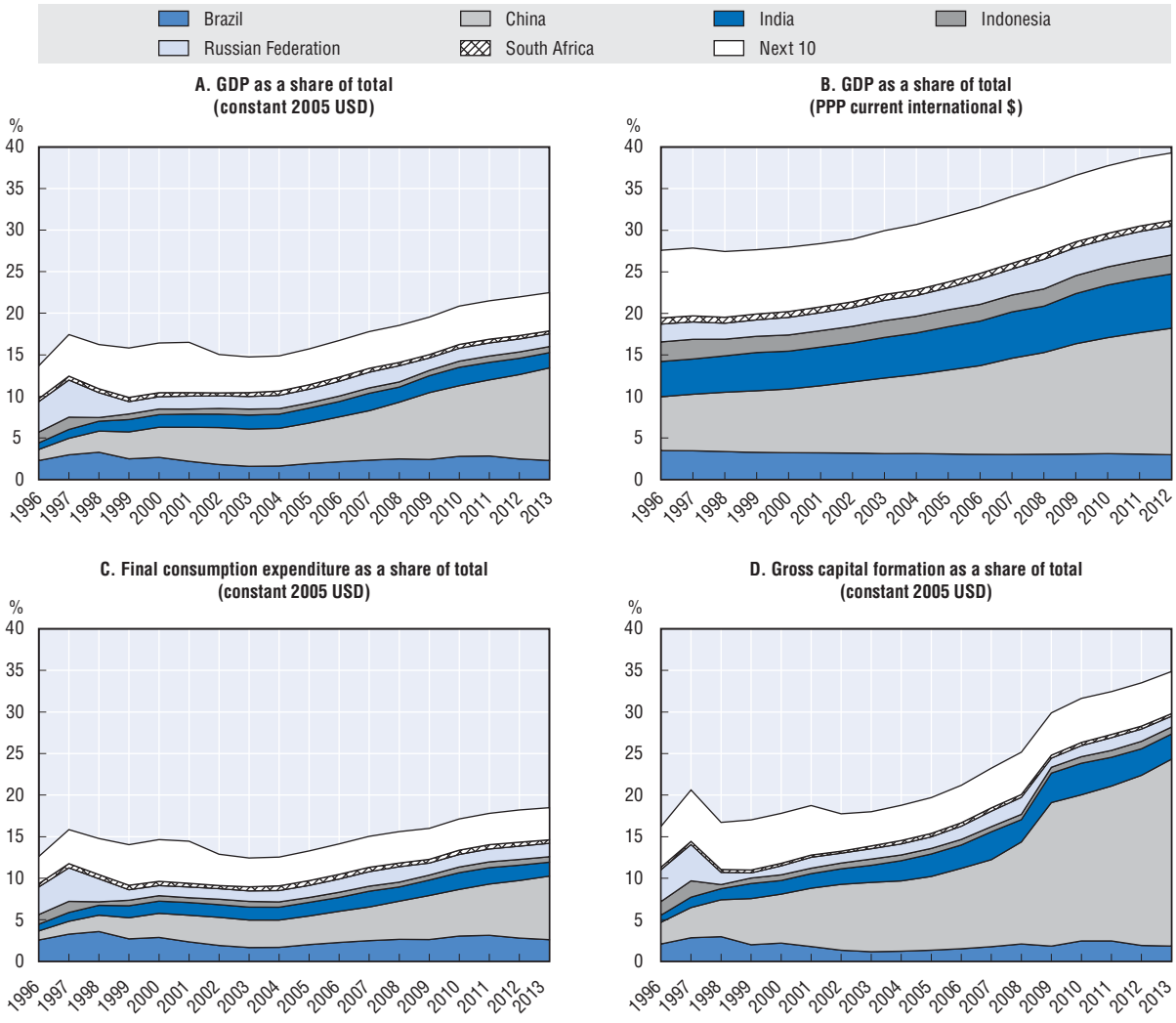
Many large developing economies are still able to fully reap the benefits of dual transformation and the demographic dividend as their populations are relatively young and largely residing in rural areas. Declining fertility rates and slower population growth in those economies are expected to support growth for a few decades to come. India and Indonesia are among these economies and can potentially provide a boost to global demand over the coming decades before ageing kicks in. In addition to India and Indonesia, the other BRIICS economies are also expected to provide a boost to global demand for some time to come, even though their demographics may not be as favourable. Beyond the BRIICS, there are other economies of

comparatively large size that jointly could also have a significant impact on the global economy. The next ten economies in terms of GDP in 2013 include Saudi Arabia; Chinese Taipei; Argentina; the United Arab Emirates; Thailand; Colombia; Venezuela; Iran; Malaysia; and Singapore. These ten economies together with the BRIICS commanded almost one-quarter of world GDP in 2013, up from about 14% in 1996, and in purchasing parity terms accounted for almost 40% of world output in 2012, up from about 28% in 1996 (Figure 1.6, Panels A and B).

Consumption by the growing "middle classes" in the large non-OECD economies, as well as creating the need for improved infrastructure and business investment to achieve development objectives, will emerge as new drivers of global demand. In terms of

Figure 1.6. **Large non-OECD economies command an increasing share of world output, consumption and investment**

Shares of output, consumption and investment in the world total of the BRIICS and the next ten non-OECD economies



Note: Next ten non-OECD economies, based on GDP current USD in 2013 are: Saudi Arabia, Chinese Taipei, Argentina, United Arab Emirates, Thailand, Colombia, Venezuela, Iran, Malaysia, Singapore. The GDP figures in PPP terms in Panel B are based on the new PPP figures released in May 2014. For Argentina and Chinese Taipei, the GDP time series in PPP terms using the new benchmark year, 2011, have been calculated by the authors as these time series are not available in the World Development Indicators.

Sources: Authors' calculations based on IMF (2014b), *World Economic Outlook* (database), International Monetary Fund, Washington, DC, accessed April 2014 (for Panels A, C and D) and on World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators* (for Panel B).

StatLink http://dx.doi.org/10.1787/888933057514

household consumption, the share of the BRIICS and the next ten largest non-OECD economies in global household consumption only reached 18% in 2013 (Figure 1.6, Panel C), due mainly to the small share of household consumption in GDP in China. The ten largest non-OECD non-BRIICS economies together commanded a world consumption share comparable to that of India or the Russian Federation. China's gradual shift to higher consumption and improving incomes in the other economies, provided they adopt the necessary overhauls of their development strategies towards more robust, inclusive and sustainable growth, will be a significant driver of global growth in the decades to come.

The BRIICS and other large non-OECD economies also have the potential to support global growth through investment. The total investment of these economies reached more than one-third of global investment by 2013 (Figure 1.6, Panel D), much higher than their share in world consumption, again mainly due to the "China factor", i.e. China's rapid catching up in investment. Given the very low capital stock in most emerging economies and the need for a better quality infrastructure and more capital goods for industrialisation, this share is expected to increase, boosting global demand for capital goods.

In the longer term, several other economies with large populations are expected to replace the other emerging economies as sources of global growth, many of which will slow due to ageing. Those new emerging "stars" may include populous countries like Bangladesh, Egypt, Ethiopia, Nigeria and Pakistan. While their demographics are favourable now, they should not miss the demographic dividend by failing to provide job opportunities through industrialisation for the increasing number of entrants to labour markets.

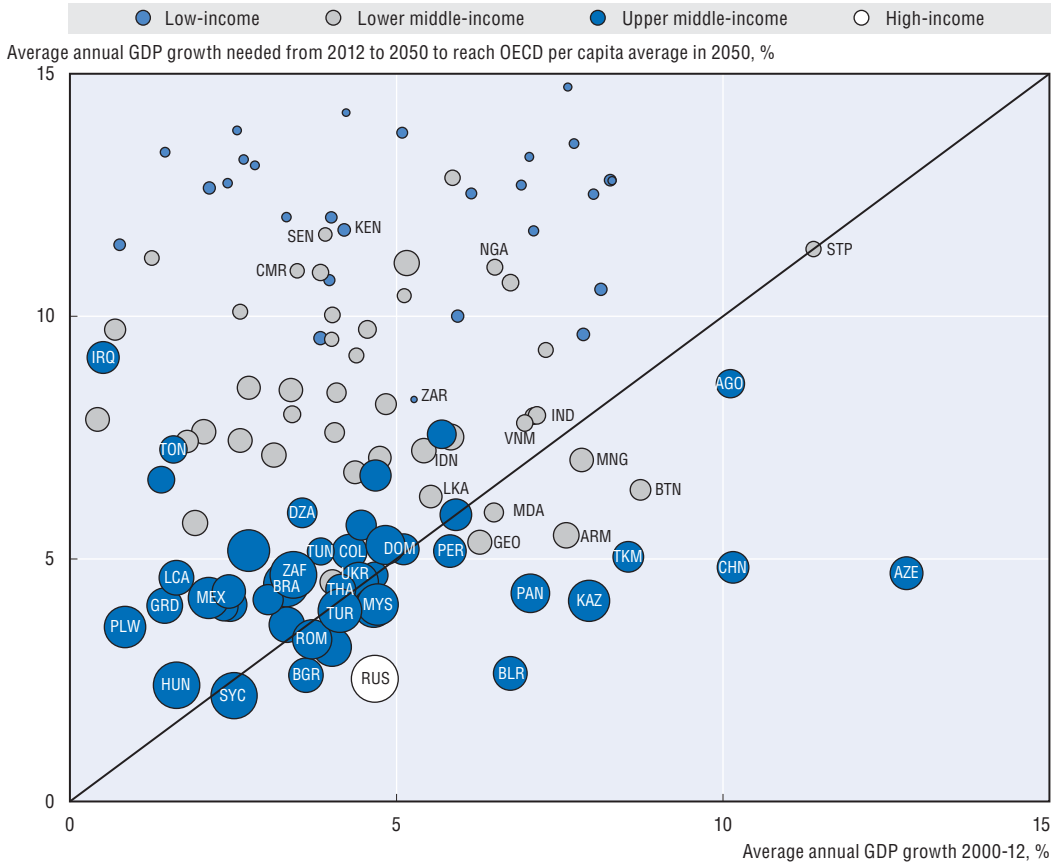
The challenge of productivity for convergence

Notwithstanding the recent boost from China's rise, a number of upper middle-income countries are still not growing fast enough if their per capita incomes are to converge with those of advanced countries in the next 30 years. It is natural for growth to slow as economies mature, as predicted by growth convergence theories (Aiyar et al., 2013) and seen in lower average annual growth rates (over 2000-12) in upper-middle-income compared to lower-middle-income and low-income countries (Figure 1.7). However, this slowdown has become important enough to prevent convergence of many upper middle-income countries with average OECD incomes by 2050 at their average growth rates over 2000-12. These countries include Brazil, Colombia, Hungary, Iraq, Mexico and South Africa (just to mention a few).

Naturally, countries in the lower-middle-income and the low-income brackets will on average need longer to reach income convergence with advanced countries than upper-middle-income countries. Thus, most of countries from these income groups would need more time than until 2050 to converge with average OECD incomes, despite impressive growth performances during recent years in some cases (Figure 1.7). Among many others, this holds for India, Indonesia, Nigeria, Sri Lanka and Viet Nam from the group of lower-middle-income countries.

In some middle-income countries, trend growth (that is, the average growth rate over 2000-12) is sufficient or actually above the one needed for convergence with average OECD incomes by 2050 (Figure 1.7). China, Panama and Kazakhstan are among those upper-middle-income economies that will be at average OECD levels in the next decades, if they can sustain their growth performance. Also the Russian Federation, which is classified as high income since 2013, grows fast enough to increase incomes to the OECD

Figure 1.7. **Many upper middle-income countries may not converge to average OECD GDP per capita by 2050**



Notes: GDP in constant 2005 PPP-adjusted USD in all economies are assumed to continue growing at their average growth rates over 2000-12. The OECD per capita income level is a simple average of the 34 member countries, with Israel included for 2000-11. It should be noted that the requirement of reaching average OECD income levels is stricter than just reaching high-income status as almost all OECD countries are in the high-income bracket. For population in 2050, the UN projections were used, at median fertility rates. Country names are abbreviated by 3-digit ISO codes.
Source: Authors' calculations based on World Bank (2013), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933057533

average level. Impressively, some lower middle-income countries – Armenia, Bhutan, Georgia and Mongolia, for example – will also move to the high-income bracket before 2050, if they continue growing at the average growth rate over 2000-12.

These results are of course just indicative and countries' growth trajectories are not set in stone. For example, India surprised everyone when it started to grow at around 8% after 2003 having grown at an average of closer to 5% for the previous decade. Also, trends in "shifting wealth" will change with lower average growth in China, which will affect growth prospects in other developing economies too. Furthermore, it is unclear how long it will take for advanced countries, particularly in Europe, to fully recover from the global financial crisis, or whether growth in advanced countries will remain relatively low for the decades to come. Economic performance in high-income economies will also affect future growth in developing countries. Whether convergence of developing countries with advanced countries will be slower or faster, if growth in advanced countries remains relatively low is yet another uncertainty. It would be slower for those developing countries

that are, for example, dependent on exports to richer economies. It would be faster for others that have their key trading partners better diversified across geography and/or are sufficiently large to continue fast growth through internal demand.

Low economic growth can be associated with low productivity growth

The poor prospects for a number of middle-income economies to converge with average OECD income levels in the next 30 years raises the question whether these countries are in the so-called "middle-income trap". Admittedly, the theoretical foundation for such a trap continues to be debated and there are no common criteria defining what makes a country become trapped in the middle-income bracket. Another issue is the definition of income groups, which again is not related to theory, but is an arbitrary decision. Most literature builds on purely statistical methods to identify countries facing the "middle-income trap" (Box 1.1).

Despite the absence of a common framework to identify the trap, it is clear that middle-income countries often face sustained periods of lower growth and thus difficulties to move up to higher income brackets (see for example, Eeckhout and Jovanovic, 2012; Gill and Kharas, 2007; or World Bank and DRC, 2012). Moreover, such growth slowdowns are often associated with significant slowdowns in growth of total factor productivity (TFP) (Aiyar et al., 2013; Eichengreen et al., 2011 and 2013). It is found that on average 85% of the slowdown in the rate of growth of output is explained by the slowdown in TFP growth (Eichengreen et al., 2011).

Box 1.1. **Identification of and factors associated with the "middle-income trap" or "growth slowdowns" in the literature**

A major issue related to the "middle-income trap" discussions is the lack of theoretical foundation. Most literature builds on purely statistical methods to identify countries facing the "middle-income trap" or a sustained growth slowdown. Structural breaks in economic growth are often used to identify "growth slowdowns" (e.g. Berg et al., 2012). Growth spells defined by structural breaks tend to be shorter in African and Latin American countries, while longer in Asia.

Others apply thresholds criteria for growth rates and income levels and argue that the trap could occur more than once (Eichengreen et al., 2011 and 2013). Growth slowdowns according to these criteria are largely explained by slowdowns of productivity. Among other factors, countries with higher shares of secondary and tertiary educated people as well as those that have higher shares of high-technology exports are found to be less likely to experience a growth slowdown.

Also applying a threshold approach, a recent study calculated the threshold number of years for a country to be in the middle-income trap and the minimum growth rate required to avoid the trap (Felipe et al., 2012). The lower middle-income bracket is found to last at most 28 years, and a minimum growth rate of 4.7% per annum is required to avoid falling into that trap, while the upper middle-income trap lasts at most 14 years, and at least 3.5% annual growth is required to avoid it. Using these definitions, the middle-income trap has been found to mostly occur at the low level of the middle-income range. 13 out of the 35 countries in the trap are in Latin America, 11 in the Middle-East and North Africa, 6 in sub-Saharan Africa and 3 in Asia.

Sustained growth slowdowns – applying the so-called episode approach (Aiyar et al., 2013) – can be identified by deviations from predictions of conventional convergence theories. With this more theory-based identification method, growth slowdowns were also found to be essentially explained by slowdowns in total factor productivity growth. Factors such as a lack of a business-friendly regulatory environment, a high dependency ratio, a large public debt, poor infrastructure and civil conflicts are found to be associated with growth slowdowns at the middle-income level.

Productivity slowdowns (in return) can be associated with difficulties to move up the value chain, away from a factor accumulation-driven to an innovation-driven growth path. Many previously low-income countries have risen to middle-income status by exploiting labour cost advantages. These advantages vanish once the pool of surplus labour is exhausted and thus wages start to accelerate. Higher wages very often cannot be afforded as the economic, regulatory and governance environment is not sufficiently conducive to the innovations needed to sustain growth or to the development of the more sophisticated labour skills required for the production of higher value-added products. Moreover, in many middle-income countries, the availability and quality of infrastructure is not comparable with that in high-income countries. Infrastructure investment is particularly beneficial to growth at later stages due to its productivity-enhancing impacts through network effects, density and scale economies and other externalities, in addition to its direct additions to the capital stock.

Recognising the challenge of middle-income countries to converge with more advanced countries (Figure 1.7) and the empirically-grounded connection with productivity trends, a strong focus in this and the following chapters is given to benchmarking middle-income countries' productivity growth (but also levels) against each other and against more advanced economies. For middle-income countries to be on a fast convergence path, greater and often more difficult efforts to enhance productivity and to remain competitive on global markets are needed.

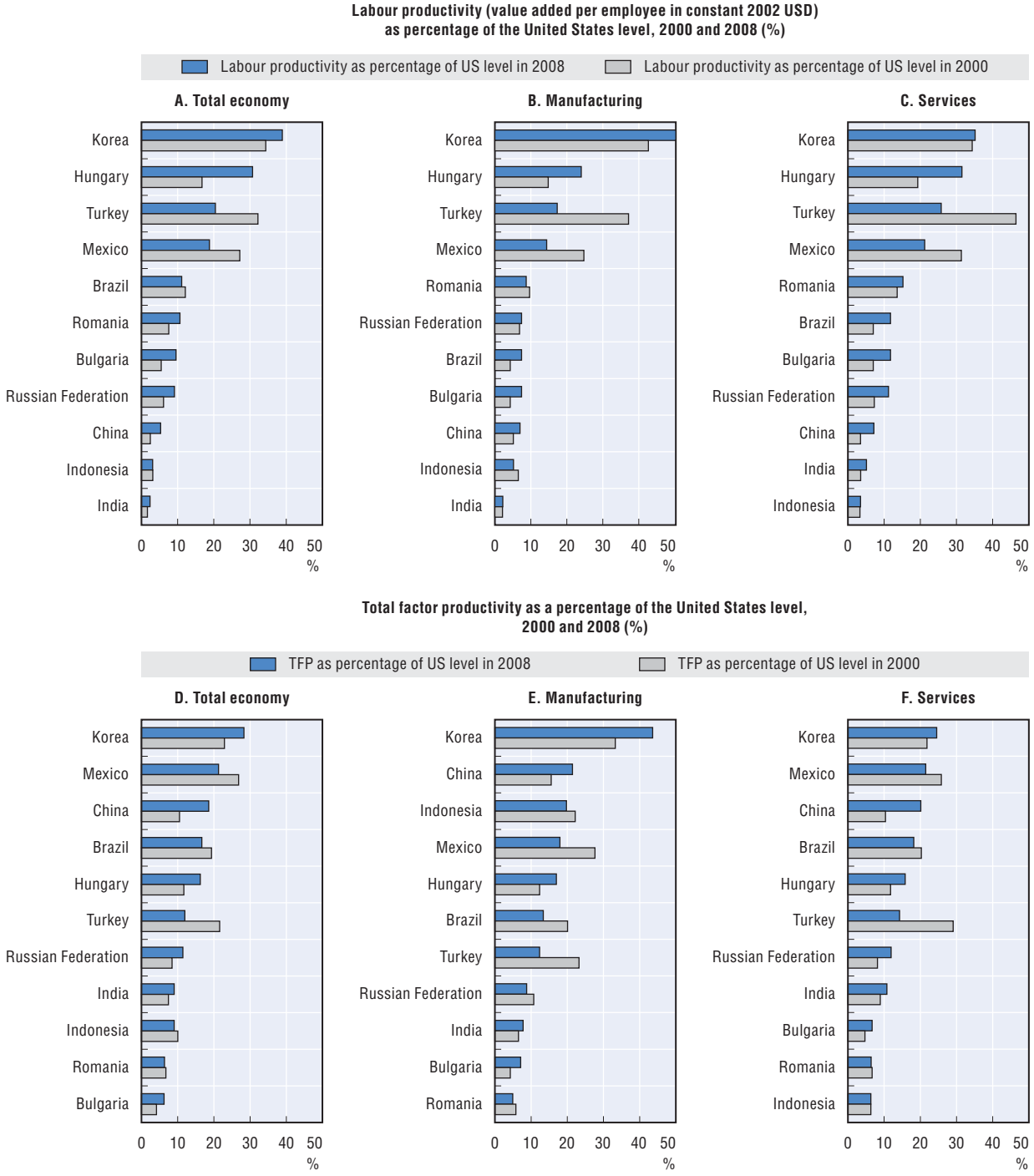
In several middle-income countries, productivity growth is indeed low as are their productivity levels

Productivity levels and growth rates have an important bearing on the ability of middle-income countries to move towards income convergence with advanced countries. While productivity growth directly translates into economic growth, productivity levels indicate to what extent a country has managed to compete in higher value-added agriculture, industry and service sectors or segments of these sectors.

The gap in productivity levels relative to the United States of many middle-income countries is still very high. One way to look at this is to present labour productivity and TFP measures at the macro level, as well as an aggregate for manufacturing and service sectors for a selected group of nine middle-income countries, plus Korea[2] and the Russian Federation (Figure 1.8). Labour productivity at the economy-wide level was below 50% of that of the United States in 2008 (in 2002 constant prices) for all countries (Figure 1.8, Panel A).[3] Among the middle-income countries, Hungary, Turkey and Mexico reported the highest levels; while China, Indonesia and India had labour productivity levels at below one-tenth of that of the United States in 2008. The Russian Federation, which recently reached high-income status according to an international classification, also had a very low aggregate labour productivity level, just above that in China, in 2008. Thus, the country faces challenges for long-term and productivity-driven growth similar to middle-income countries.

In manufacturing and services, the respective shares of United States' labour productivity levels are similarly low in these selected middle-income countries (Figure 1.8, Panels B and C). Due to relatively more productive agriculture and resource sectors, the aggregate labour productivity levels in Brazil, Mexico and the Russian Federation are higher than their levels in manufacturing. For the BRIICS (excluding South Africa due to lack of fully comparable data), labour productivity gaps in the manufacturing sector are mainly related to gaps in productivity within specific sectors rather than to the industry structure (see Figure 3.1 in Chapter 3). However, around 10% of the labour productivity gap is still explained by a relative specialisation in less productive manufacturing sectors compared to OECD countries.

Figure 1.8. **Lagging productivity in middle-income countries**



Notes: Labour productivity is defined by value added per employee (in 2002 USD). Total factor productivity (TFP) is defined as the residual explaining value added after accounting for labour and capital. All variables are in real terms and converted to USD at annual average exchange rates. The base year is 2002. TFP is estimated with sector level data for 14 manufacturing and 18 services sectors (plus for the total economy for agriculture, fishing and mining) classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Aggregate TFPs for manufacturing and service sectors are weighted by value added. Methodological details can be found in the annex (Annex 6.A1). Comparable data for South Africa was not available, but comparisons for selected manufacturing sectors suggest productivity levels for South Africa at the lower end among the BRIICS (see Chapters 3-6 for more details of the productivity analysis).
Source: Authors' calculations using Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, No. 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933057552

The gaps in terms of TFP are similarly large (Figure 1.8, Panels D, E and F). Countries with lower capital-output ratios (such as China in manufacturing and services and Indonesia in manufacturing) tend to have higher TFP levels compared to other countries, even if their labour productivity ranking is lower. Thus, manufacturers in China, for example, which had an average labour productivity level similar to manufacturers in Brazil or Bulgaria, have on average lower capital-output ratios and thus use capital more efficiently to produce outputs compared to their peers in Brazil and Bulgaria.

Labour productivity and TFP growth in a number of middle-income countries was not sufficient to markedly reduce the gap between 2000 and 2008. These include middle-income countries in the upper tier (e.g. Brazil, Mexico, Romania and Turkey) but also in the lower tier (e.g. Indonesia on both TFP and labour productivity and India in labour productivity) (Figure 1.8). In Brazil, Mexico and Turkey, the gap has in fact widened during this period. Some other countries have seen considerable productivity improvements during the 2000s. China recorded the most impressive growth in productivity over this period; around 10% annually in terms of labour productivity and above 7% in terms of TFP in both manufacturing and services. India has also experienced considerable TFP growth during the same period; though the speed of productivity improvement lagged behind China's, despite starting from a considerably lower level. For selected manufacturing sectors in China and India it appears that around three-quarters of TFP growth was driven by within-firm productivity growth rather than the reallocation of market shares between firms in various ranges of year spans between 1998 and 2011 (see Figure 3.3 in Chapter 3).

As shown for the BRIICS in Chapter 6, total factor productivity (TFP) growth has contributed significantly to overall economic growth in India and China during the last two decades (see Figure 6.4, Panels C and E, in Chapter 6) and in the Russian Federation since the mid-1990s (Figure 6.4, Panel B, in Chapter 6).[4] In all other BRIICS, the growth contribution of productivity was either negative or – if positive – relatively small. Part of China's strong productivity growth may be driven by its diversification into high technology sectors during the same period (see Chapter 6, Figure 6.A2.2).

How fast developing countries can catch up with advanced countries' productivity levels largely depends on future technology trends in advanced countries and how they will affect the developing world. The more pessimistic literature argues that productivity in developed countries will be stagnant as no big innovation cycle is foreseeable (e.g. Gordon, 2012). On the contrary, some thinkers on global economic trends expect that ever-increasing computing power, worldwide connectivity and the almost unlimited potential for generating new innovations through combining existing processes will trigger major transformations in both production and consumption (Brynjolfsson and McAfee, 2014). It is not clear how such a new wave of innovations would affect competitiveness in developed and developing countries. Uncertainty about these global trends and their impact on the global distribution of production also results in considerable uncertainty about the chances and speed of convergence of developing with developed countries.

Fading of traditional drivers of growth in some middle-income countries

Many previously low-income countries have risen to middle-income status by exploiting labour cost advantages together with, in many cases, foreign investment-led development of export industries. Trade and investment liberalisation, the first typical steps of opening to the outside world appear to bring about quick wins in terms of growth performance. In the

early phase of development, foreign technology can lead to significant productivity gains, thereby accelerating the catch-up process. Typically, the "low-hanging fruits" of international integration have been harvested in middle-income countries.

During the transition from low-income to lower middle-income and upper middle-income level, productivity receives a boost by shifting labour from lower productivity sectors to higher productivity sectors (often manufacturing and services, but also higher productivity agriculture). In some middle-income countries, such as India and Indonesia, there is still room to make productivity increases in this way. In others, this and other previous drivers of growth may be starting to lose power. These include less favourable demographics and decreasing efficiency in the use of production factors.

The contribution from the demographic dividend varies among developing economies

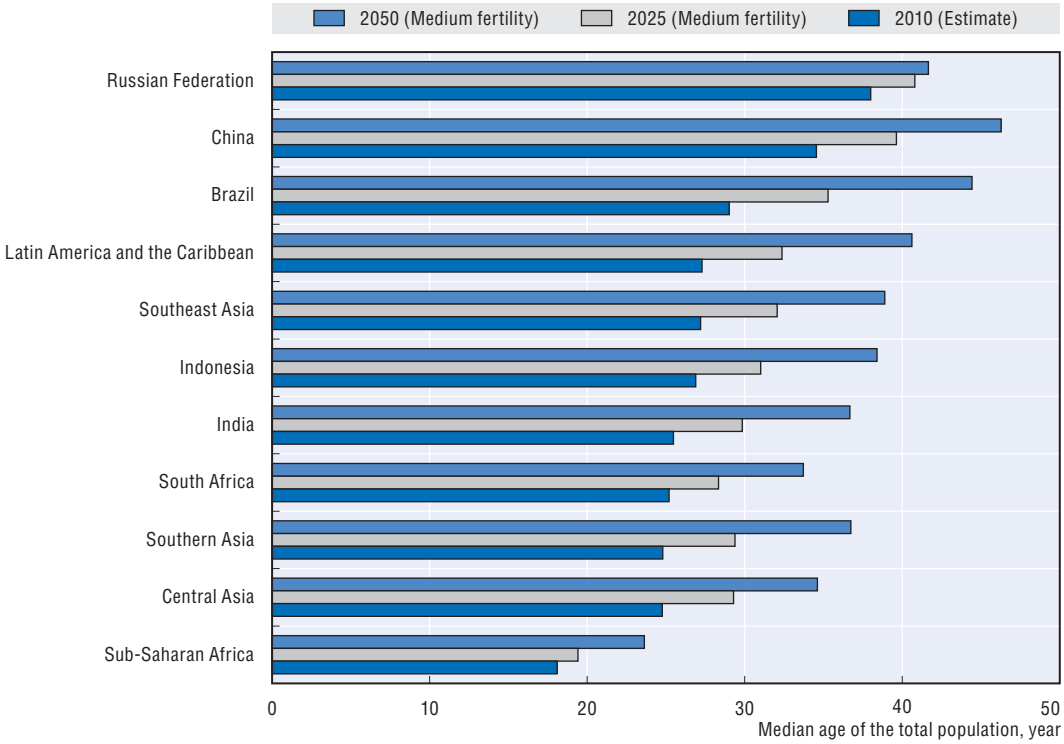
The rise to middle-income status is often accelerated by a demographic transition, whereby the working-age ratio to the population increases due to a faster decline in mortality rates than in birth rates. Thus, labour inputs are increased by an increased supply of people of working age. This "demographic dividend" has been an important factor driving the rise of many Asian countries. These include India (Aiyar and Mody, 2011), where much of the growth acceleration since the 1980s is said to be attributable to the demographic transition. Moreover, a higher working-age ratio contributes to growth through other channels: to the extent that working people save and dependents do not, it increases the household saving rate. Thus, the overall impact of the demographic dividend on national savings is expected to be positive, boosting resources available for productive investment. More savings will translate into a lower cost of capital, which is likely to boost investment rates and thereby reinforce the growth-enhancing effect of the demographic transition.

Some regions of the world still have the potential to reap the demographic dividend in the coming decades, notably South Asia and Africa. To realise their demographic potential, however, countries have to generate more sustainable jobs. In addition, a number of complementary conditions, such as broad-based access to key public services and political stability, are essential. The above-world-average child dependency ratios in most African countries constitute an important advantage for realising the demographic dividend. Africa (alongside South Asia) still has the potential to realise productivity gains from industrialisation linked to urbanisation, where labour shifts from less productive sectors (mainly low-productivity agriculture) to more productive sectors, thereby boosting growth.

However, in some middle-income countries, population ageing is a growing policy concern. Population ageing (particularly if it results in getting old before getting rich) can further aggravate the challenge of increasing labour costs in many middle-income countries as funds will need to be diverted from growth-enhancing spending to social security. Brazil, China and the Russian Federation already have an ageing population, with the highest median ages among the BRIICS (Figure 1.9). Both Brazil and China will overtake the Russian Federation in ageing by 2050, with Brazil reaching a median age of 44 years and China of 46 years. For comparison, at present only a few developed countries have a median age over 40 years, and ageing will occur in many developing countries at a much faster rate. The pace of ageing will be particularly rapid in Brazil, with its median age increasing by 14 years between 2010 and 2050. Latin America, South Asia and Southeast Asia will also age by ten years in terms of the median age, while sub-Saharan Africa will remain the youngest region in 2050, with an average age of only 24 years.

Figure 1.9. **Population is ageing rapidly in many middle-income countries**

Median age 2010, 2025, 2050



Note: Median ages estimated for 2010 and projected for 2025 and 2050.
Source: UN-DESA (2013), *World Population Prospects* (database), *http://esa.un.org/unpd/wpp/unpp/panel_population.htm.*
StatLink *http://dx.doi.org/10.1787/888933057571*

The fading demographic dividend of young and expanding populations in many parts of the world outside Africa and South Asia has a negative impact not only on labour costs but also on household savings. Older people tend to save less and at some point start to live off their savings. An increasing number of dependents tends to further lower the savings rate of the working population, by increasing the demands on workers to support their elderly family members.

The challenges from ageing and other transformations often constitute a barrier to moving up the value chain and reaching high-income status. After the initial stage of development, income growth needs to be sustained by boosting productivity to ensure that rising wages do not undermine competitiveness. Once the supply of rural migrants dries up, wages increase, and returns to capital decline (as capital becomes more abundant), growth then depends more on the ability of the economy to boost its productivity through structural and institutional reforms. Where there is still room to reap the benefits of the demographic dividend, establishing the conditions for robust job creation becomes increasingly important to ensure that the increasing numbers of working-age people are productively employed. This paves the way for the demographic transformation to support structural transition to a more industrialised and higher value-added economy. In contrast, where the demographic dividend is fading or has been missed, there is an even greater need for boosting productivity. Given the rapid ageing already underway in many developing countries, the demographic dividend is likely to become a relatively marginal factor in supporting growth, with productivity increases and capital accumulation playing a greater role.

Productivity gains from shifting labour to more productive sectors are fading with industrialisation

During the rise to middle-income status, not only does the working-age ratio increase, but the increased labour inputs are directed to more productive uses. This happens through the movement of labour out of the primary sector to higher-productivity sectors.[5] The structural changes in developing countries related to the migration of surplus labour from rural areas to cities in search of employment in low- and lower middle-income countries and the movement of labour from less productive to more productive manufacturing industries in middle-income countries are the major drivers of such changes. A transition from a command to a market economy may also trigger such structural changes.

Transformation of the economy can be traced from simple sectoral shares of value added that show that in many BRIICS and other developing countries the share of agriculture shrank by up to two-thirds over the past 40 years (Table 1.1). During the same period, few countries experienced a significant increase in their manufacturing value-added

Table 1.1. **Sectoral transformation is dramatic in some economies**

Changes in shares of agriculture, industry, manufacturing and services in value added over 1970-2012

	Agriculture, value added (% of GDP)		Industry, value added (% of GDP)				Services, etc., value added (% of GDP)	
			Total industry, value added (% of GDP)		*Manufacturing subset, value added (% of GDP)*			
	1970	2012	1970	2012	1970	2012	1970	2012
BRIICS								
Brazil	12.35	5.24	38.30	26.29	29.32	13.25	49.35	68.47
China	35.22	10.09	40.49	45.31	33.75	32.46***	24.29	44.60
India	41.95	17.39	20.48	25.75	13.70	13.53	37.57	56.86
Indonesia	44.94	14.44	18.69	46.95	10.29	23.94	36.37	38.61
Russian Federation		3.87		36.00		15.19		60.13
South Africa	7.16	2.57	38.18	28.41	22.81	12.38	54.66	69.02
Ten largest non-OECD non-BRIICS middle-income economies								
Saudi Arabia	4.54	2.24	62.58	62.57	8.85	10.07	32.88	35.18
Iran	19.99	10.22*	38.31	44.47**	10.14	10.55***	41.70	45.31
Argentina	9.64	9.09	42.28	30.50	31.54	19.67	48.08	60.41
United Arab Emirates		0.91*		53.94**		10.07***		45.15****
Thailand	25.92	12.27	25.31	43.56	15.94	33.98	48.78	44.17
Colombia	25.69	6.52	28.30	37.51	21.15	12.99	46.02	55.97
Venezuela	6.11	5.79*	39.33	52.16**	16.07	13.92***	54.56	42.05****
Malaysia	29.44	10.05	27.39	40.85	12.44	24.24	43.17	49.10
Hong Kong, China		0.06		7.08		1.55		92.86
Singapore		0.03		26.73		20.70		73.23
Selected OECD middle-income countries								
Chile	6.91	3.59	41.96	35.55	25.88	11.02	51.13	60.86
Mexico	12.73	3.56	32.15	35.75	23.15	17.37	55.11	60.69
Poland		3.54*		31.63**		18.49***		64.83****
Turkey	40.17	9.08	22.53	27.04	16.53	17.75	37.30	63.88
OECD average	6.24	1.52	37.30	23.98		15.31	56.46	74.53

Notes: Selected non-OECD middle-income economies are the next ten largest economies after the BRIICS, based on the size of GDP in current USD in 2011 (Saudi Arabia; Iran; Argentina; United Arab Emirates; Thailand; Colombia; Venezuela; Malaysia; Hong Kong, China; and Singapore).
* Agriculture: data for Poland as of 2010, for Iran 2007, UAE 2010 and Venezuela 2010.
** Industry: data for Poland as of 2010, Iran 2007, UAE 2010 and Venezuela 2010.
*** Manufacturing: data for China as of 2010, Poland 2010, Iran 2007, UAE 2010, Venezuela 2010.
**** Services, etc.: data for Poland as of 2010, Iran 2007, UAE 2010 and Venezuela 2010.
Source: World Bank (2013), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

shares: Indonesia, Malaysia and Thailand, for instance, doubled these shares. In contrast, Brazil and South Africa saw a halving of that share, indicating mainly a shift towards services. Changes of comparable magnitudes in service shares of value added are rarely seen, although China and Turkey are exceptions in that they almost doubled their services share.

The shift of labour drives productivity gains during the transformation and ultimately boosts growth. Decomposition of labour productivity changes into those resulting from shifts among sectors and those resulting from increases in productivity in individual sectors sheds light on these trends (Box 1.2).

This study examines in detail productivity data for 32 sectors in 39 economies for the period 2000-09 (see Annex Table 1.A2.1). Productivity gains resulting from the movement of labour from less productive to more productive sectors (the so-called "shift effect") continue to be an important driver of overall productivity in several non-OECD countries (Figure 1.10) even after reaching middle-income status. In overall terms, most developing economies were able to narrow their labour productivity gap with the OECD countries through changes in the industry composition of employment over 2000-09. This shift effect was particularly large over that period in several economies such as Romania, Turkey, Lithuania, Greece, India, China, Poland and Indonesia, indicating a healthy process of restructuring in those economies. The shift effect even dominated within-industry productivity gains in some cases, for instance in Brazil, Indonesia and Romania as well as, among OECD economies, in Mexico and Turkey. Productivity gains related to the shift of labour to more productive sectors are expected to continue in developing countries. In some large economies such as India and Indonesia, where the share of employment in agriculture is still close to 50% and 40% respectively, there is still ample room for the

Box 1.2. **Shift-share decomposition**

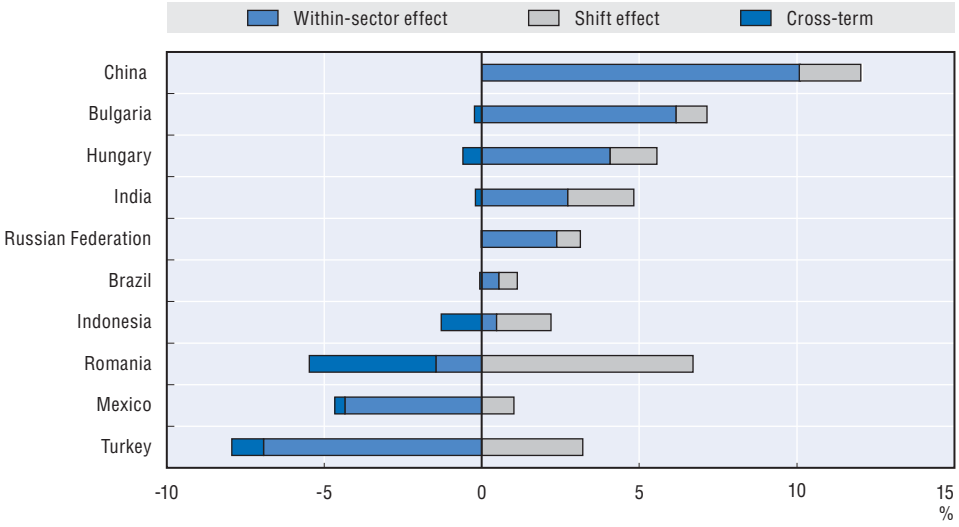
Shift-share analysis is a useful tool to delineate the effect of within- and across-sector factors on productivity gains. Aggregate changes in labour productivity are decomposed into a within-sector effect, a shift effect and a cross-term effect (Figure 1.10).

- The within-sector effect measures the impact of productivity growth within each sector on total economy productivity growth, assuming that sector labour shares are unchanged.
- The shift effect measures the impact on total economy productivity resulting from the movement of labour between sectors, assuming that the level of productivity in each sector is unchanged.
- The cross-term effect measures the change in both labour share and productivity in each sector and accounts for the impact of labour re-allocation between sectors with varying productivity growth rates. If the sign of the cross-term effect is positive, it indicates that the within-industry and shift-effects are complementary, that is, productivity growth is positive in expanding industries and negative in contracting industries. Conversely, if the cross-term effect is negative, it indicates that the within-industry and shift effects are substitutes, that is, productivity growth is positive in contracting industries and negative in expanding industries.

A major caveat of shift-share analysis is its sensitivity to industry detail i.e. the number of industrial sectors used for the analysis. If the number of sectors is too few, a large part of cross-sectoral shifts will go unaccounted and will appear as within-industry productivity growth. This may lead to ignoring significant structural transformations, therefore a large number of sectors is preferable.

Figure 1.10. **Productivity increases within sectors have contributed most to productivity growth in some middle-income countries but not all**

Shift-share decomposition of productivity growth, average annual growth over 2000-09 (%)



Notes: Results are based on 32 sectors including agriculture, mining, 14 manufacturing and 16 service industries. Productivity is measured by value added at constant prices per person employed. The within-sector effect measures the impact of productivity growth within each sector on total economy productivity growth, assuming that labour shares are unchanged. The shift effect measures the impact on total economy productivity resulting from the movement of labour between sectors, assuming that the level of productivity in each sector is unchanged. The cross-term effect measures the change in both labour share and productivity in each sector and accounts for the impact of labour re-allocation between sectors with varying productivity growth rates. See Annex 1.A1 for methodological notes and Annex 1.A2 for estimates on more countries and details for specific sectors.

Source: Authors' calculations using Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper,* No. 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933057590

movement of labour out of the primary sector to higher-productivity sectors. Even in the higher income countries such as Brazil, the Russian Federation and South Africa there is still some room for this type of shift. Conversely, in a number of OECD economies this structural transformation involving the movement of labour to manufacturing and services jobs appears to be completed, as indicated by a negative shift-effect term (see Annex Table 1.A2.1). This is the case in Finland, the Netherlands, the United States, Belgium, the United Kingdom, the Slovak Republic and Germany. In these countries, workers appear to be moving into lower-productivity industries.

In OECD countries, within-sector productivity increases explain a large portion of overall productivity developments (see Annex Table 1.A2.1). In some developing countries, the within-industry effect is also the largest, for example in China or India. In the longer term, once the catching-up mechanism of shifting employment to higher productivity sectors is exhausted, generating productivity gains within industries becomes the major source of productivity growth. As it assumes no changes in employment shares of industries, a within-sector term that is smaller than aggregate productivity growth may suggest that industries with higher productivity growth have increased their share in total employment. This is observed in many economies such as Brazil, China, India, Indonesia and the Russian Federation. China has in particular been successful in boosting productivity in most industries thanks in large part to its strategy of tapping global knowledge through inward foreign direct investment as well as by acquiring new technology through mergers and acquisitions and other means.

The cross-term – measuring correlations in an economy between productivity and employment changes – reveals that among the countries examined here, only China has complimentary within-industry and shift effects (Figure 1.10). More specifically, in China, productivity growth is positive in expanding industries and negative in contracting industries, while in the rest of the sample, productivity growth is positive in contracting industries and negative in expanding industries. This effect is particularly large in Indonesia, Romania and Turkey, indicating that productivity gains are reaped in contracting rather than expanding industries.

During the past decade, non-manufacturing industries have been driving within-industry productivity gains in the BRIIC economies (no comparable data is available for South Africa). In addition to agriculture, which led productivity gains among the 32 industries used in the analysis for Brazil and China, several modern service industries were major engines of productivity growth (Annex Table 1.A2.1). Wholesale trade was the strongest driver in the Russian Federation and the second strongest in China, while retail trade was the most important in India. The contribution to productivity growth by the telecommunications industry was significant in India and Indonesia, reflecting the ICT revolution in those economies. Major productivity growth engines among manufacturing industries differed widely across the BRIIC economies, with basic metals and chemicals leading the manufacturing sector in China, food and beverages and tobacco in Indonesia, refinery activities in India and machinery in the Russian Federation. In Brazil, although the chemicals industry contributed most to within-industry productivity growth among manufacturing industries, its individual contribution as well as overall within-industry productivity growth was relatively low. Moreover, many manufacturing industries registered negative contributions to within-industry productivity growth over 2000-09.

In many developing countries, within-sector productivity gains could be strengthened by efficiency gains in service industries, which have been the major contributors to productivity growth in OECD members. Since the service sector is expected to account for an increasingly large share of employment in developing countries, particularly upper middle-income countries, efficiency and competition in those industries will be especially important to maintain the high productivity growth that was previously driven by manufacturing industries (see Chapter 4).

Efficiency in the use of production factors is declining in several emerging and developing economies

Even if production factors – capital, labour and human capital – continue accumulating, convergence to high income status may decelerate and even stall if those factors are not efficiently employed. Low labour utilisation rates, in particular of women, the elderly and the young, often constitute a drag on a country's catch up. Moreover, workers with a job can be underemployed in terms of the utilisation of their time or skills. By the same token, in addition to inadequate investment, inefficient investment and under-utilisation of productive facilities may similarly hinder the catching up process.

In the countries examined here (Table 1.2), labour force participation rates are on a par with or above OECD levels, except for in India and South Africa where they are not only lower but actually declining (see the country notes in Chapter 6 for a more detailed discussion). Unemployment rates in most developing countries are currently lower than in OECD countries because the direct impact of the financial crisis was stronger in developed

Table 1.2. **Labour force participation and unemployment in selected countries**

	Labour force participation rate, total (% of total population ages 15-64)		Unemployment rate (%)
	2000	2012	2012
Brazil	71.8	74.9	5.5
China	82.4	77.0	4.1
Cameroon	69.7	71.1	3.8
Colombia	67.5	70.6	10.6
India	61.3	57.9	3.6
Indonesia	69.5	70.0	6.6
Russian Federation	70.4	73.1	5.5
Senegal	77.0	77.9	–
South Africa	59.3	55.7	25.0
OECD	69.8	70.6	8.0

Note: Unemployment figures for Cameroon are from 2010; unemployment figures for Indonesia are from 2011.
Sources: World Bank (2013), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*; unemployment figures for Brazil and China from IMF (2013), *World Economic Outlook* (database), International Monetary Fund, Washington, DC, accessed 17 February 2014.

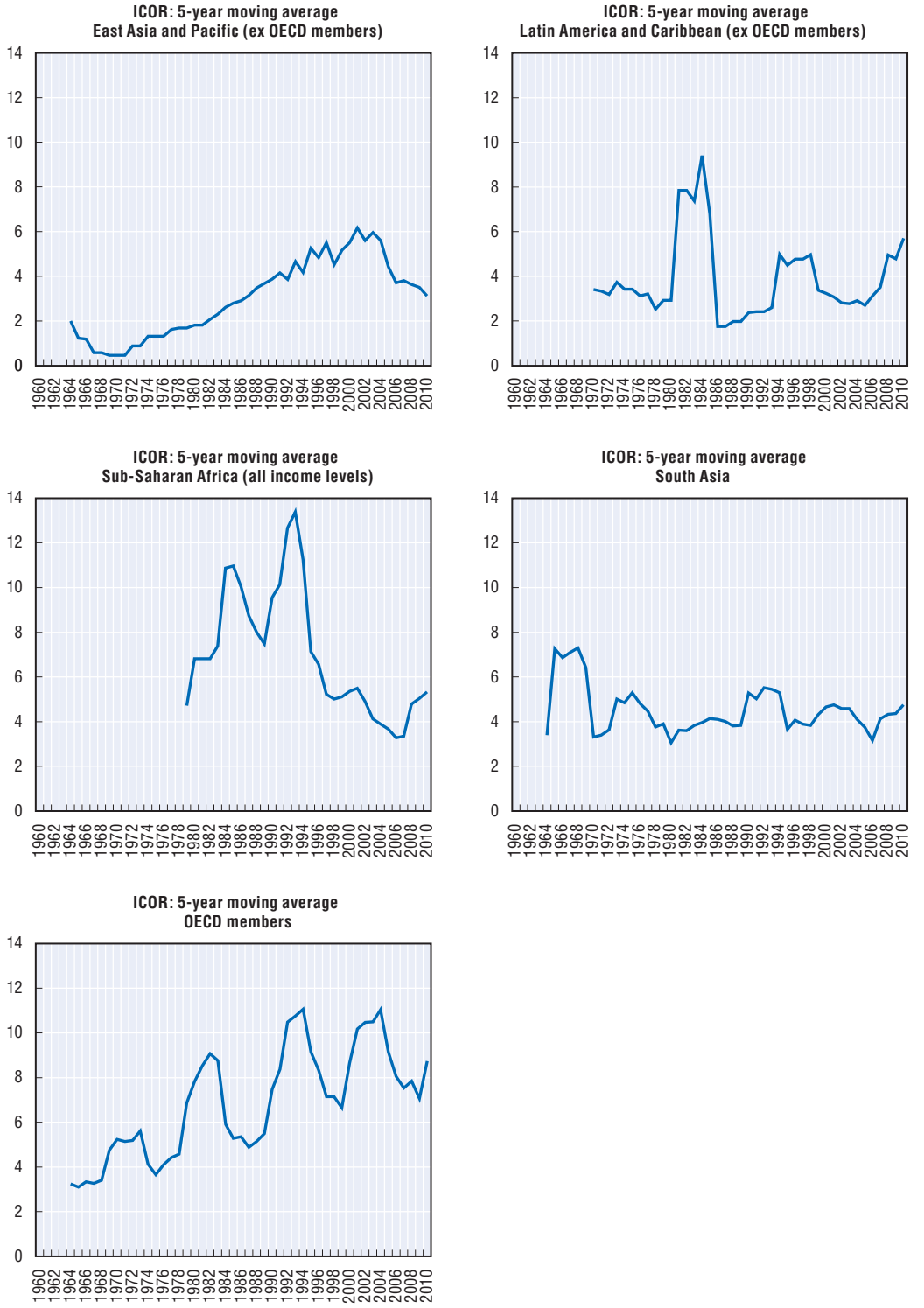
economies. The big exception among the developing economies examined here is South Africa, which has an unemployment rate of 25%. This is very unusual in developing and emerging economies: given the lack of social protection in many developing countries, few can afford to choose to be unemployed. Instead, workers take whatever job opportunity arises in order to survive, irrespective of whether it is full time, productive or utilises their skills. This underemployment of labour is not unique to developing countries but it is quite typical. Not many developing countries compile underemployment statistics, but, for instance, in Colombia and South Africa, the underemployment rate in 2012 was 5.3% and 4%, respectively (ILO, 2013).

As with labour, capital may also be inefficiently employed, thereby slowing overall convergence. An often used indicator for capital efficiency is the incremental capital-output ratio (ICOR), which shows the amount of additional capital required to generate an additional unit of output. Thus, a high/rising ICOR implies low/falling efficiency of investment as more investment is required to generate a unit of GDP. The calculation of ICOR assumes that there are no diminishing returns to capital, that there is no lag between investment and production and there is full capacity utilisation.[6] While these assumptions cannot be viewed as holding exactly in the real world (and while the actual calculation involves other difficulties [Box 1.3]), the ICOR can still be considered as a rough benchmark for trends in investment efficiency in the long run.

Investment efficiency has been deteriorating in South Asia and sub-Saharan Africa in recent years, while it has improved in East Asia and the Pacific since 2000 (reversing a longer-term trend of deteriorating investment efficiency over the past few decades) (Figure 1.11). In other regions, no clear trends can be identified. Most BRIICS countries have shown falling investment efficiency over the past decades, with the exception of India and Indonesia. Falling investment efficiency over the years as capital accumulates is a common phenomenon, but in most BRIICS, even China, the capital stock is still relatively low so accumulation needs to continue in the coming decades.

Figure 1.11. **Investment efficiency has improved recently in East Asia and Pacific**

Incremental capital-output ratio (ICOR) 1960-2010



Note: The ICOR measures the amount of investment needed to produce a unit of GDP. A higher value indicates lower efficiency compared to a smaller value. The ICOR was calculated as a five-year moving average to smooth fluctuations in data.

Source: Authors' calculations based on World Bank (2013), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators.*

StatLink http://dx.doi.org/10.1787/888933057609

Box 1.3. **Issues in measuring ICORs**

The measurement of ICORs is subject to a number of important caveats. The major concern is related to the inclusion in aggregate investment figures of different types of investments with different gestation periods and hence a varying lag with which investment affects output. This lag is short for business investment, while it is much longer for large-scale infrastructure projects that may take several years to complete and before they can bring about measurable benefits. Another type of investment, in real estate, may have a much smaller impact on growth than infrastructure or business investment. Therefore, ideally, an ICOR analysis based on the breakdown of investment types would be more indicative of the actual investment efficiency of the economy. Another important caveat is the volatility of ICORs resulting from the volatility in GDP growth, which has little to do with how efficient investment may be. If growth is close to zero, the measured ICOR may approach infinity, and if GDP contracts, then the ICOR can even turn negative. Volatility in ICORs is usually smoothed by using moving averages over five or more years, but negative growth rates of GDP are hard to smooth. For this reason, ICORs for the five years since the start of the global crisis need to be interpreted with additional caution. In any case, ICORs are best used as rule-of-thumb measures of investment efficiency over the long run, i.e. several decades.

Furthermore, it is not just the amount of the factors used that matters, but also their quality. Human capital, which refers to worker skills and the quality of labour resources, is shown to drive much of the inter-industry variation of productivity because of the complementary nature of technology and skills (Chanda and Farkas, 2010).

Boosting productivity for development

This chapter has set the scene of shifts in the global economic landscape, identified the productivity challenge for convergence of developing with developed country GDP per capita and presented significant productivity gaps and often low productivity growth performances over the last decade in middle-income economies. Moreover, it has shown that the drivers of growth are often changing at the middle-income level and countries need to move up the value chain, increasingly by boosting productivity within sectors, in order to remain competitive in global markets and enable continued growth. The following chapters discuss a set of factors that are relevant to increase productivity (and competitiveness more broadly) once the old drivers of growth are fading. In each chapter, developing countries' productivity (and in some cases their technical efficiency) performances are benchmarked against one another as well as (in most chapters) against more advanced economies. Moreover, relevant policy options to address these factors are discussed.

The next chapter contrasts the achievement of many developing countries in catching up with developed country income levels against their more uneven labour productivity growth during the last decade. It argues that low productivity growth is partly related to a relative specialisation in low-cost, low-technology and labour-intensive sectors. Thus, productivity should be boosted through diversification into higher value-added agriculture, industry and service sectors. The chapter also presents core underlying factors that can foster a country's competitiveness and productivity sustainably. These factors include the efficiency and effectiveness of product, labour and financial market institutions as well as public governance; coherence between education policies and technological absorption mechanisms; equality of opportunities; and the effectiveness of governments to implement critical reforms.

Chapter 3 examines how middle income countries can capitalise from manufacturing through diversification into higher value-added activities and improved products and processes. One key message includes that countries should enable productivity improvements increasingly within sectors; particularly if diversification through broader sectoral reallocations is fading. The chapter makes extensive use of firm-level data to get detailed insights of the factors that matter for firm competitiveness, which in the end are key for the competitive stance of a country more broadly. In particular, the role of competitive pressure; firm age and size; international integration through imports, exports and FDI; government involvement; the quality of production factors; innovation and skills for productivity at the firm level are investigated. The final section of the chapter addresses energy and carbon efficiency as additional dimensions of competitiveness not always internalised by firms. This detailed analysis allows identifying evidence-based options for policy action.

Fostering the development of competitive service sectors has great potential to enhance overall competitiveness and ultimately to contribute to the convergence process. They can help create jobs and – with their relatively low resource intensity – drive inclusive, sustainable development. Rapid progress in ICT has allowed economies of scale in the production of most services and spillover effects to be realised. Chapter 4 endeavours in particular to show that services can contribute to the movement towards convergence in that they help increase consumption, complement manufacturing, and are increasingly tradeable. In middle-income countries, growing middle classes consume more goods and services. Given that consumer services generally show higher income elasticity than basic goods, there is an increasing demand for services and for innovative ways to provide them. Moreover, middle-income countries can move up the value chain in manufacturing through using more business-related services (e.g. labour recruitment, ICT, marketing, customer contacts and R&D) that are outsourced to independent firms. Also, advances in ICT are opening up greater possibilities to export services. The chapter shows that while emerging countries' productivity levels in some services are still considerably lower than those of the advanced economies, they are catching up. In the last section, the chapter identifies policy options to develop competitive service sectors.

Economic development tends to be accompanied by uneven growth between regions, as early drivers of growth may be geographically concentrated and connections within a country may be underdeveloped. Widespread convergence in regional income is not seen in many emerging economies, but there is some evidence that convergence in productivity is underway. Regional disparities are widely considered to lock developing countries in relative income stagnation. Chapter 5 argues that, in addition to nation-wide policies, regional policies to support overall national objectives of stronger, more equitable and greener economic growth are needed in developing countries to continue convergence with advanced countries. The chapter discusses regional disparities in economic development across some BRIICS countries and other emerging economies, before exploring the drivers of regional competitive advantages and the policy options and strategies for activating them.

Chapter 6 focuses on the development challenges of the BRIICS. In 2012 they accounted for 67% of all developing country economic activity in PPP terms and 56% of their population. They also have a very strong indirect impact on other developing countries through their import/export activities and their FDI (especially China); but also on OECD economies (again particularly China). They represent very different types of economies, development paths, and development challenges. Thus, how the BRIICS

further develop and how they deal with very diverse challenges provide important implications on other countries' prospects. The chapter firstly explores – at the aggregate level – the sources of economic growth and the development of international integration in the BRIICS. Building on this, the chapter also includes individual country notes for each of the BRIICS providing a broader overview of the development paths and challenges of these countries (including their social and environmental development challenges), which helps to bring out some of the similarities and contrasts among these important emerging economies. Income inequality, for example, has risen in all the BRIICS except Brazil and most of these countries face social tensions. Also, all have challenges of environmental degradation, particularly China and the Russian Federation where rapid industrialisation has had a heavy toll on the environment. Each country note lists key areas of policy adjustments to address these broader challenges.

Key considerations for boosting productivity and supporting development

Emerging and developing countries continue to grow faster than advanced countries – so the process of "shifting wealth" continues. However, the differential rate of growth between the two country groups has narrowed in the last few years. Moreover, in many richer middle-income countries, trend growth (average GDP growth over the period 2000-12) is not sufficient for income convergence with the OECD by 2050.

Low growth spells at the middle-income level are often associated with low growth in productivity, which can in return be associated with difficulties to move up the value chain, away from a factor accumulation-driven to an innovation-driven growth path. Middle-income countries can consider four key areas when developing their strategies to improve productivity. These areas are not mutually exclusive so countries can make improvements in different areas at the same time and they are often interlinked. Moreover, some countries have greater opportunities and possibilities than others in some areas depending on their specific conditions and capabilities. The four key areas, which are elaborated in more details in Chapters 2-6 (providing specific policy options), include:

- *Diversifying continuously into higher value-added sectors within agriculture, industry (including manufacturing) and services*. A boost in diversification into higher value-added sectors, which would also boost productivity, is needed to remain competitive in global markets at the middle-income level (see Chapters 2 and 6).
- *Innovating through the adoption of existing knowledge elsewhere in the world and increasingly through own technological capabilities*. Middle-income countries often still have significant room for technological catch-up, as seen by their still very low labour productivity and TFP compared to advanced countries. Besides better international integration through trade and FDI, countries can make effective use of technology licensing; getting technology, designs, production and management assistance from foreign buyers, consulting firms, and technical experts; foreign education and training; among others. Countries also need to innovate new products, processes, services and forms of organisation that are better suited to their needs than what they can get from abroad, as well as to develop their own frontier shifting innovations to create competitive edges (see Chapters 2, 3 and 4).
- *Reforming product, labour and financial markets as well as skills development schemes*. In many middle-income countries, the development of productive, innovative businesses is often constrained by an inadequate regulatory environment or unavailability of appropriate skills. The regulatory environment also needs to balance labour market flexibility (with respect to wage determination as well as hiring and firing) and employment protection. Education and skills also need to better match the needs of the market (see Chapter 2). A more business-friendly regulatory environment is associated with higher productivity levels (see Chapters 3 and 4). A regulatory environment that encourages firm entry is an important source of competitive pressure and innovative technologies (see Chapter 3).

Key considerations for boosting productivity and supporting development *(cont.)*

- *Fostering competitive service sectors*. The domestic service sector can grow to meet the demand of the growing middle classes. Services can also increase the competitiveness of manufacturing and be a source of export earnings (see Chapter 4).

Making improvements in the four key areas above can be a focus both for low and middle and also high income countries, but getting these areas right becomes more crucial in the upper middle-income bracket. At the same time, most middle-income countries (including in the upper bracket) can and should continue exploiting the "old" drivers of growth. As mainly identified in this first chapter and partly in Chapters 2-6, these traditional drivers of economic (and productivity) growth include:

- *Shifting labour from lower productivity (agricultural) sectors to higher productivity (agricultural, industry and service) sectors*. Many middle-income countries still have room to better reap the dual-economy shift; among others, India, Indonesia, Iran and Malaysia. Moreover, the shift of labour effect still importantly and positively contributed to labour productivity growth in many countries between 2000 and 2009, including in India, Indonesia, Mexico and Turkey.
- *Fully reaping factor accumulation-led growth (including the utilisation of labour and the accumulation of human and physical capital)*. Most middle-income countries still have room to make improvements in several of these areas. Labour force participation and utilisation in India and South Africa, for example, is still considerably below the levels in China and Brazil or more advanced countries. Developing significant employment opportunities is even more important in these countries given their relatively young populations that will soon enter the labour market. The average years of total schooling are still considerably lower than the OECD average. In addition the quality of education in most developing countries is far behind the OECD average as revealed by low PISA scores. Also, physical capital stocks (including infrastructure, business capital and real estate) are still low relative to the OECD. At the same time, efficiency of investment – measured by ICORs – is decreasing in many middle-income countries, including in China. Therefore, countries also need to address efficient allocation of their investments (see Chapters 2 and 6).

Additionally, development is more than economic growth. Fostering equitable and sustainable development to continue toward convergence includes:

- *Ensuring equal opportunities for all citizens*. In many middle-income countries, poverty is still widespread and/or income inequality has risen during the last decade. There are also rising tensions in a number of middle-income economies, kindled by the "middle classes" thwarted expectations as to standards of living and voice in the decision-making process. Ensuring equal opportunities would help reduce poverty and inequality. It would also encourage all citizens to take part in the development of their country and decrease the risks of social instability (see Chapters 2 and 6). In particular, greater and more inclusive educational attainment is a way for converging countries to reduce inequality in market incomes in the long run. Beyond enrolment, the standard of education needs to receive attention so that increases in educational outcomes effectively translate into greater productivity, better growth prospects, more job creation and improved chances in the labour market.
- *Developing effective regional policies to support more equitable growth and reduce regional disparities*. This requires identifying regional competitive edges and tailoring public services to local needs with priorities to heavily populated poor areas (see Chapter 5).
- *Increasing energy efficiency to improve economic competitiveness and to grow in an environmentally sustainable way*. "Shifting wealth" and expansion of manufacturing in more energy-intensive middle-income countries (including in the BRIICS) had led to considerable increases in energy consumption (see Chapters 3 and 6). To avoid vulnerabilities due to fluctuations in energy prices and changes in regulations and preferences, countries should diversify into less energy-intensive sectors and adopt energy-efficient technologies. Such strategies are associated with higher productivity and reduced negative externalities. In addition, more attention has to be paid to environmental sustainability in crafting successful development strategies.

Key considerations for boosting productivity and supporting development *(cont.)*

Finally, maintaining rapid growth with equity and sustainable development requires capable and effective government. This implies a need to:

- *Develop greater capability to develop and implement plans.* This requires better training of government officials and establishment of co-ordination mechanisms across government ministries, as well as effective implementation capacity. To concentrate scarce government resources and enhance the effectiveness of the policy interventions, targeting and prioritisation of the steps to ensure convergence are needed. Bold changes in strategies may be politically difficult and costly though less so than no change. Effective communication strategies and the right timing are critical to obtain support by multiple stakeholders to implement these reforms (see Chapter 2).

The future growth paths of emerging and developing countries also very much depend on the broader international environment because of the increasing interdependence of the global system. In the short run it is going to be affected by development in international financial markets. The gradual exit of quantitative easing in the United States and internal factors in emerging countries have triggered strong capital outflows and financial volatility (IMF, 2014a). To reduce capital outflows and to avoid currency depreciations, central banks in emerging and developing countries have tightened monetary policy. Since mid-2013 long-term interest rates have been increasing, rendering long-term investments more expensive. This will have a negative impact on growth in most emerging and developing countries, particularly those that rely on net international capital inflows. In the medium and longer run it also depends on the stability of the global financial system as well as other broader drivers such as technological change, and the ability of the global system to address global challenges such as climate change.

Notes

1. India also increased its raw material imports, but not as much as China. However, the two countries now account for almost a quarter of the world's raw material imports.
2. Korea is included as a useful benchmark of a country that successfully reached high income status without being caught in a middle-income trap.
3. In Chapter 2, Figure 2.1, the aggregate labour productivity gap is illustrated for a larger set of developing countries in all geographic regions. Differences in the ranking may be related to a different base year, a different method of calculation and the different data source. The aggregate labour productivity levels in Figure 1.8 are estimated for 14 manufacturing sectors, 18 services sectors, agriculture and fishing as well as mining using sector level deflators with the base year 2002. Aggregate labour productivity in Figure 2.1 is estimated using aggregated GDP, deflated with an aggregate GDP deflator with the base year 1990.
4. TFP growth in the Russian Federation at the beginning of the 2000s may partly be due to a rapid increase in commodity prices. The deflators used may not fully account for these increases.
5. This is a broad generalisation. There are high productivity subsectors in agriculture as well as low productivity subsectors in manufacturing and services. Development is also about moving to higher productivity subsectors and activities within subsectors, and as will be developed later, there are important interactions across sectors. Furthermore, as will be developed later, it is important to go beyond narrow productivity issues to consider social cohesion as well as environmental sustainability issues as part of development strategies.
6. The Harrod-Domar framework relates the growth rate of the economy to its saving rate and capital-output ratio. With higher saving rates, the economy will grow faster as more funds will be available for investment. Structural reforms can increase growth without changing the saving rate by achieving a more efficient use of capital and is said to have been the case at the time of the opening of China in the 1980s.

References

Aiyar, S, R. Duval, D. Puy, Y. Wu and L. Zhang (2013), "Growth Slowdowns and the Middle-Income Trap", *IMF Working Paper*, No. 13/71.

Aiyar, S. and A. Mody (2011), "The demographic dividend: Evidence from the Indian states?", *IMF Working Paper*, No. 11/38.

Arizala, F., E. Cavallo and A. Galindo (2009), *Financial development and TFP growth: Cross-country and industry-level evidence*, Inter-American Development Bank, *www.iadb.org/res/%20publications/pubfiles/pubWP-682.pdf*.

Berg, A., J.D. Ostry and J. Zettelmeyer (2012), "What makes growth sustained?", *Journal of Development Economics*, No. 98.

Brynjolfsson, E. and A. McAfee (2014), *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, W. W. Norton & Company, New York.

Chanda, A. and B. Farkas (2010), "Technology-Skill Complementarity and International TFP Differences".

Eeckhout, J. and B. Jovanovic (2012), "Occupational choice and development", *Journal of Economic Theory,* Vol. 147, No. 2, pages 657-683.

Eichengreen, B., D. Park and K. Shin (2013), "Growth slowdowns redux: New evidence on the middle-income trap", *NBER Working Papers*, No. 18673, Cambridge, MA.

Eichengreen, B., D. Park and K. Shin (2011), "When fast economies slow down: International evidence and implications for China", *NBER Working Papers*, No. 16919, Cambridge, MA.

European Commission (2003), *The EU Economy: 2003 Review*, European Economy, No. 6, Office for Official Publications of the European Communities.

Felipe, J., A. Abdon and U. Kumar (2012), "Tracking the middle-income trap: What is it, who is in it and why?", *Levy Economics Institute of Bard College Working Paper*, No. 715.

Gill, I. and H. Kharas (2007), *An East Asian Renaissance: Ideas for Economic Growth*, World Bank, Washington, DC.

Gordon, R. (2012), "Is US economic growth over? Faltering innovation confronts the six headwinds", *NBER Working Paper*, No. 18315, Cambridge, MA.

ILO (2013), *ILOSTAT* (database), International Labour Organization, *www.ilo.org/ilostat/faces/home/statisticaldata?_adf.ctrl-state=pqy3ob9k4_4&clean=true&_afrLoop=347157379665257*, accessed 17 February 2014.

IMF (2014a), *World Economic Outlook Update: Is the Tide Rising?* International Monetary Fund, Washington, DC.

IMF (2014b), *World Economic Outlook* (database), International Monetary Fund, Washington, DC, accessed April 2014.

IMF (2013), *World Economic Outlook* (database), International Monetary Fund, Washington, DC, accessed 17 February 2014.

Nordhaus, W. D. (2002), *Alternative methods for measuring productivity growth including approaches when output is measured with chain indexes*, *www.econ.yale.edu/~nordhaus/home/welf_062402.pdf*.

OECD (2013), "Channels of shifting wealth" in *Perspectives on Global Development 2013: Industrial Policies in a Changing World*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/persp_glob_dev-2013-en*.

Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, No. 10, *www.wiod.org/publications/papers/wiod10.pdf*.

UN Comtrade (2014), *United Nations Commodity Trade Statistics* (database), *http://comtrade.un.org/db/default.aspx*.

UN-DESA (2013), *World Population Prospects* (database), *http://esa.un.org/unpd/wpp/unpp/panel_population.htm*.

UNCTAD (2013), *UnctadStat* (database), *http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx*.

World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

World Bank (2013), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

World Bank and Development Research Centre of the State Council (DRC) (2012), *China 2030 – Building a Modern, Harmonious and Creative High-Income Society*, World Bank, Washington, DC.

ANNEX 1.A1

Methodological notes

Shift-share analysis of labour productivity growth

The productivity-decomposition analysis used in this chapter is based on the shift-share analysis described in European Commission (2003), which decomposes aggregate changes in labour productivity into an intra-industry, a shift and an interaction effect. The "within-industry effect" measures productivity growth within each sector. The "shift effect" measures the effect on total economy productivity of the movement of resources between industries of varying productivity levels. Finally, the "interaction effect" (cross term) accounts for labour re-allocation effects between industries with varying productivity growth rates.

For each individual industry i labour productivity is defined as output (Y) divided by labour input (L):

$$LP_{it} = \frac{Y_{it}}{L_{it}}$$

$$LP_t = \frac{Y_t}{L_t} = \sum_i Y_{it} \,/\, \sum_i L_{it}$$

When expressed in nominal terms, labour productivity can be written as a weighted sum of the within-industry productivity values:

$$LP_t = \sum_t LP_{it} \frac{L_{it}}{L_t}$$

This gives, in difference terms:

$$\Delta LP = \sum_i \Delta(LP_i) \frac{L_{it-1}}{L_{t-1}} + \sum_i LP_{it-1} \Delta(\frac{L_i}{L}) + \sum_i \Delta(LP_i) \Delta(\frac{L_i}{L})$$

Dividing by LP_{t-1} to get the growth (percentage change) and rearranging the terms:

$$\frac{\Delta LP}{LP_{t-1}} = \sum_i \frac{\Delta LP_i}{LP_{it-1}} \frac{Y_{it-1}}{Y_{t-1}} + \sum_i \frac{LP_{it-1}}{LP_{t-1}} (\frac{L_{it}}{L_t} - \frac{L_{it-1}}{L_{t-1}}) + \sum_i \frac{1}{LP_{t-1}} (\Delta LP_i) \Delta(\frac{L_i}{L})$$

The first component is the within-industry effect, i.e. the sum of industry productivity growth rates, weighted by the initial (nominal) output shares.

The second component is the shift effect, i.e. the sum of changes in input shares, weighted by the relative productivity level (i.e. the ratio of industry productivity to average productivity). This effect could also be written and decomposed as the sum of industry labour input growth rates, weighted by initial output shares, minus total labour input growth.

The sign of the residual (interaction) component is usually negative (in the economy there is a majority of industries where the productivity change and the labour input change have opposite signs). It may, however, be positive when beneficial restructuring of the economy occurs (in this case, most of the industries enjoying productivity growth are at the same time attracting more resources).

The decomposition described above would strictly hold only in the case of (discrete) percentage changes. The logarithmic approximation (used throughout the study) entails an error of magnitude often comparable to the interaction effect. We have, however, defined the within-industry effect and the shift effect analogously to the discrete case. A corresponding decomposition for the continuous time case can be found in Nordhaus (2002), who has also shown that when "old-fashioned" price index methods are used (i.e. not the Törnqvist method), one should add to the decomposition an additional term accounting for the drift in prices.

Estimation method for total factor productivity at the sector level

The TFP estimation is based on a panel of 42 countries (including mostly OECD countries and the BRIICS, without South Africa) for 14 manufacturing and 18 service sectors for the years 1995-2009. The source of the data is the World Input Output Database (WIOD).

The estimation is based on a standard Cobb-Douglas production function with technological coefficients α for physical capital and β for labour:

$$Y_{i,c,t} = A_{i,c,t}\ (K_{i,c,t})^{\alpha} (L_{i,c,t})^{\beta} \qquad (1)$$

where Y, A, K and L are: real value added, total factor productivity, real capital stock and number of employees, respectively. Real values are calculated using country- and industry-specific price deflators (with the base year of 2002). The nominal data is converted into USD using year average exchange rates from the WIOD.

The capital stock is not directly available and is therefore constructed based on investment data using the perpetual inventory approach. The initial capital K_0 is defined as follows (Arizala et al., 2009) (country and industry subscripts are omitted):

$$K_0 = \frac{I_0}{g+\delta} \qquad (2)$$

I_0 represents real gross fixed capital formation for a given industry in 1995, g corresponds to the average growth rate of investment between 1995 and 2002 and δ constitutes the depreciation rate of physical capital that is set to 8%.

Having determined the initial capital stock K_0, capital stock can be calculated for all subsequent years, as follows:

$$K_t = (1-\delta)^{*} K_{t-1} + I_{t-1} \qquad (3)$$

The following log-linearised production function is estimated for all sectors and countries at the same time (where smaller case letters stand for values in logarithmic form):

$$y_{i,c,t} = \alpha l_{i,c,t} + \beta k_{i,c,t} + \rho_c + \mu_i + \sigma_t + \varepsilon_{i,c,t} \qquad (4)$$

The log-linearised TFP estimates are defined as follows:

$$lTFP_{i,c,t} = \rho_c + \mu_i + \sigma_t + \varepsilon_{i,c,t} \quad (5)$$

where ρ_c stands for the country-specific technological factor, μ_i for the sector-specific technology factor which does not vary across countries, σ_t for the time-dependent factor constant across countries and sectors. $\varepsilon_{i,c,t}$ is the residual of the regression and varies across sectors, countries and time.

ANNEX 1.A2

Additional tables

Table 1.A2.1. **Shift-share analysis of labour productivity growth per person, 2000-09**

StatLink http://dx.doi.org/10.1787/888933080086

Table 1.A2.2. **Within-industry effects by industry 2000-09**

StatLink http://dx.doi.org/10.1787/888933080105

Perspectives on Global Development 2014
Boosting Productivity to Meet the Middle-Income Challenge

Chapter 2

Competitiveness in a catching-up context

This chapter examines ways to foster competitiveness and increase productivity to avoid the middle-income trap. It begins by contrasting the achievement of developing economies in boosting per capita incomes with their more uneven labour productivity growth. The first section examines trends in diversification and specialisation as a factor explaining low productivity growth and discusses the importance of diversifying into higher value-added sectors. The last four sections of the chapter present some of the core underlying factors that can foster sustainable competitiveness and increase productivity, including: product, labour and financial market institutions and public governance; synergies between education and technology policies, examining educational attainment and the channels through which middle-income countries tap global knowledge and generate knowledge domestically; policies to create equality of opportunity, looking at recent trends in income distribution; and finally, the crucial role that effective governments play in implementing reforms.

The "shifting wealth" process has brought relatively easy growth gains to many developing countries. Over the past two decades, the rise of emerging economies (particularly the People's Republic of China) and stronger enhanced globalisation have created greater opportunities for trade, financial flows, and knowledge transfer, considerably changing the global economic landscape (OECD, 2013a). Much of the recent increase in trade appears to be the result of the growing demand for commodities from China, as well as outsourcing and offshoring, with manufacturing fragmented across borders as firms exploit comparative cost advantages. Foreign direct investment (FDI) and multinationals have been crucial vehicles in building global production networks.

However, there are rising concerns over the sustainability of the convergence process and thus the possibility of a middle-income trap (see Chapter 1 for a detailed discussion). One such worry is that if the locomotives of world growth – particularly China – were to run out of steam, the development of other economies would suffer. A second concern is that low-cost advantages are fading with increasing wages and thus developing countries increasingly have to become competitive in other sectors or segments of sectors, i.e. they have to move up the value chain in manufacturing and services, innovate by adopting existing knowledge elsewhere in the world and by developing own technological and innovation capabilities. Moving in that direction would require developing countries to catch-up in productivity from currently very low levels as compared to more advanced economies.

This chapter first contrasts the striking achievement of many developing economies in catching up with developed-country income levels in the 2000s with their more uneven labour productivity growth. It then goes on to argue that low productivity growth is partly related to a relative specialisation of many developing countries in low-cost, low-technology and labour-intensive manufacturing as well as in natural resources.

The second section argues that a boost in diversification into higher value-added sectors, which would also boost productivity, is needed to remain competitive in global markets. This holds particularly for those developing countries that are reaching the limits of factor accumulation-led growth and have seen rising wages as well as those that are rich in natural resources. Moreover, diversification will make countries less vulnerable to external shocks.

The last four sections of the chapter present some of the core underlying factors that can foster sustainable competitiveness and increase productivity. One such factor is having the right product, labour and financial market institutions and public governance set-up in place. In addition, closer coherence between education policies and technological absorption mechanisms would ensure that the skills required for economic modernisation are available and that modernisation is spread across different sectors. In a context of the growing inequality often associated with catching up and of the risk of thwarting people's expectations, policies to create equality of opportunity and stabilise the rising "middle

classes" are key to ensuring that they play their role in the development of the country. Finally, countries need to have effective governments that are capable to implement the critical reforms.

Large productivity gaps and relative specialisation in low value-added sectors

Productivity in many developing countries is still very low compared to more advanced countries (Figure 2.1, but also see Chapters 1, 3, 4 and 6, illustrating these productivity gaps at more disaggregated sectoral levels). To illustrate to what extent the rapid convergence in GDP per capita in many developing countries in the 2000s is related to labour productivity improvements, GDP per capita can be decomposed into labour productivity (defined by GDP per person employed) and labour utilisation (defined by total number of employees as a ratio of total population). The catch-up in labour productivity was – with some exceptions (e.g. Azerbaijan, China, India, Indonesia, Nigeria and the Russian Federation) – weak or the productivity gap with the OECD average even widened (Figure 2.1). They were countries from Latin America such as Brazil, Bolivia, Mexico and Costa Rica; Africa, e.g. Algeria, Cameroon, Cote d'Ivoire, Kenya, Senegal; and Asia, e.g. Bangladesh, Pakistan and the Philippines.

The rapid rise in GDP per capita in many non-OECD economies in the 2000s was, in fact, partly linked to improvements in labour utilisation (as measured by number of persons employed as a ratio of total population) together with recovery from the instability and crises of the 1990s. Growth in labour utilisation was high in Latin America (with the exception of Mexico), as it was in many African countries, in particular Algeria, Cameroon, Ethiopia and Mali, albeit significantly lower than in Latin America (Figure 2.1). The picture in Asia was mixed, with significant increases in labour utilisation in Pakistan, Cambodia and Viet Nam, but decreases in other countries like China and India. However, this measure of labour utilisation gaps or surpluses does not indicate to what extent countries are using their working age population, but it indicates whether countries have the potential to improve the labour utilisation once the demographic structure of their economies assimilates with OECD countries (see Chapter 1, Table 1.2, for comparisons of labour force participation and unemployment rates, indicating labour utilisation among the working age population).

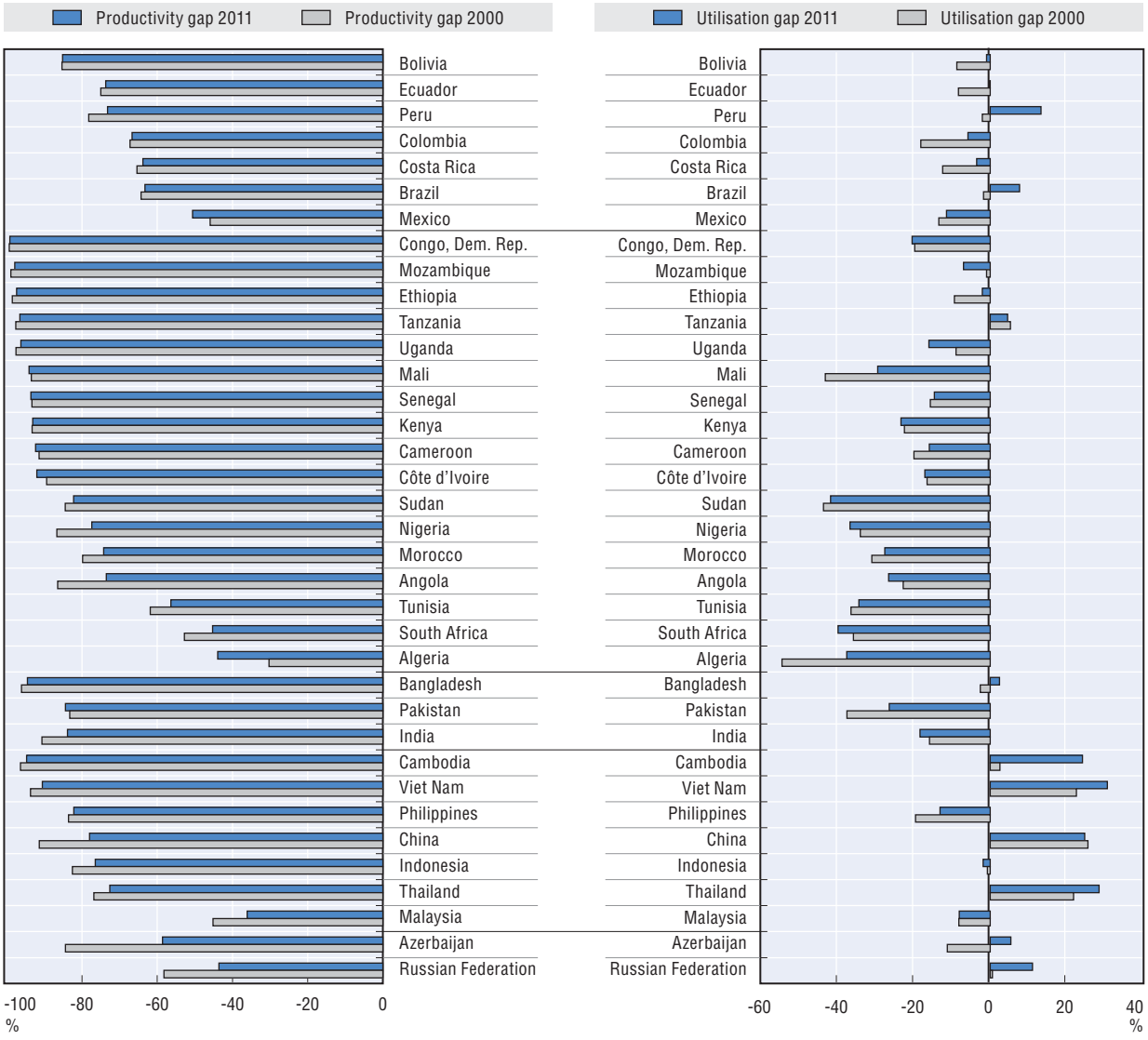
Although improvements in labour utilisation are a positive trend, low productivity growth in Latin America and Africa is all the more worrying as the fall in informal employment should have boosted labour productivity further. Indeed, informality is often associated with low productivity, and many affected firms struggle to be more productive because of barriers such as poor access to finance or the general lack of trust from contract partners (ILO, 2013). In Latin America, for instance, a limited degree of catch-up in labour productivity with advanced economies is the main reason for the middle-income growth slowdown. If the region employed existing physical and human capital at the same level of productive efficiency as the United States, per capita income may double (Moreno, 2011).

Many developing countries remain specialised in low value-added sectors

Relatively low productivity growth in many developing countries during the last decade is partly related to their continued, and sometimes increased, specialisation in relatively low-value-added, low-technology and labour intensive sectors (see Chapter 6, Annex Figure 6.A2.2, for an illustration of the BRIICS). Where there have been gains in labour productivity they were often tied to specialisation driven by the shifting wealth process and associated changes in relative prices, as well as to the movement of labour from agricultural to manufacturing sectors (see Chapter 1). A particular example is

Figure 2.1. **Labour productivity catch-up stalled in a number of countries but labour utilisation improved in Latin America and some other countries**

Percentage gap with respect to OECD average in GDP per person employed (in PPP, constant 2011 international $) and in employment as a ratio to the total population, 2000 and 2011



Note: The measure of labour utilisation gaps/surpluses does not indicate to what extent countries are using their working age population, but it indicates whether countries have the potential to improve the labour utilisation once the demographic structure of their economies assimilates with OECD countries (see Chapter 1, Table 1.2, for comparisons of labour force participation and unemployment rates, indicating labour utilisation among the working age population).

Source: Authors' calculations based on World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

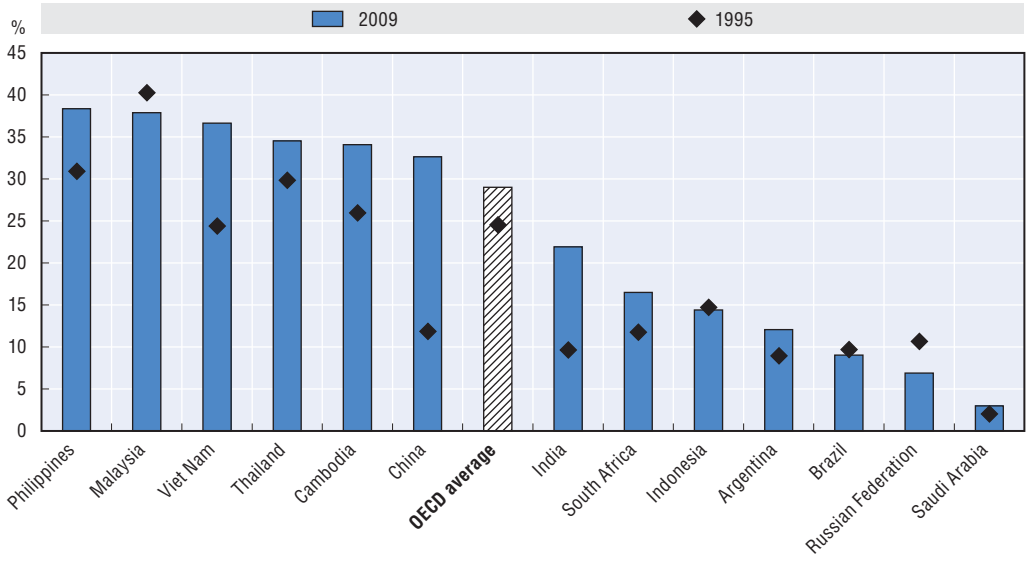
StatLink http://dx.doi.org/10.1787/888933057628

supplied by countries rich in natural resources for which Chinese demand is high. They have enjoyed rising terms of trade, increasing exports, and improving current account balances. However, they have also seen their competitiveness challenged in the manufacturing sectors. In fact, the example of many resource-rich countries shows that the commodity price boom induced by shifting wealth reduced the level of export diversification in these countries due (depending on the country) to price effects or possible Dutch disease effects.[1]

While China has rapidly integrated into global value chains since its accession to the WTO in 2001 (IMF, 2011), so – increasingly – have other developing economies. One-third of all Chinese exports in 2009 contained foreign input, significantly up from the 12% in 1995 and reflecting China's specialisation in the assembly and processing of electronic components (Figure 2.2). Generally speaking, there is evidence of deepening economic integration worldwide since 2001, as the growth in the international trade of intermediate goods bears out (Sturgeon and Memedovic, 2011). To a certain extent, countries endowed with natural resources that account for low foreign content of gross exports are also integrated into the globalisation process through their exports of natural resources.

Figure 2.2. **Countries show different degrees of integration into the global value chains**

Foreign content of gross exports as a percentage



Source: OECD (2013b), *OECD-WTO Database on Trade in Value-Added* (TiVA) (database), *www.oecd.org/industry/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm.*

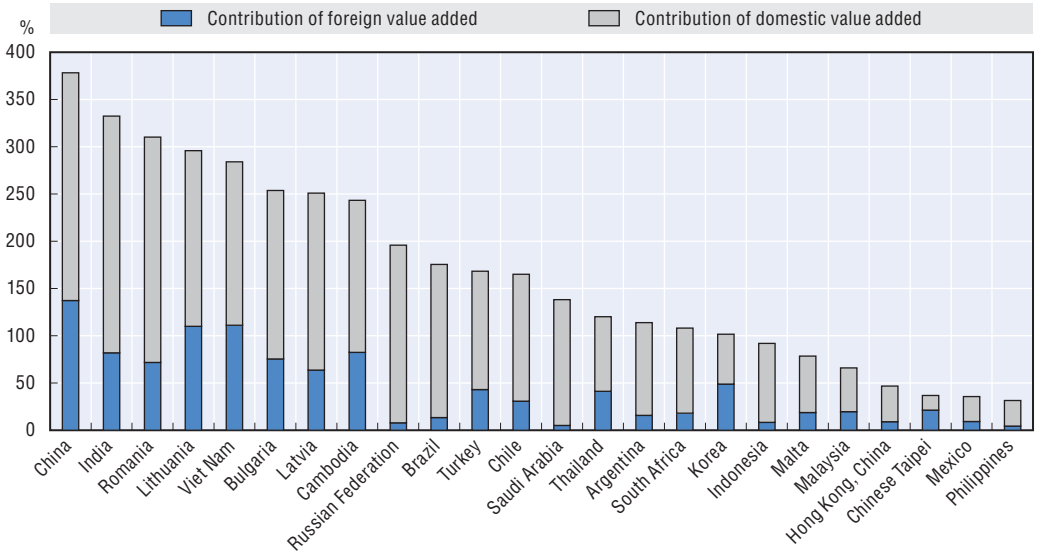
StatLink http://dx.doi.org/10.1787/888933057647

Developing countries have often benefitted from their integration into world trade through a greater product specialisation that has, to a large extent, built on their existing comparative advantages. Overall, low-income countries boast relatively large (net) exports in resource or labour-intensive products (e.g. agricultural produce, raw materials, apparel and shoes), while middle-income countries, particularly the larger ones, have turned into net exporters of more capital-intensive products and have seen their (net) exports in primary sectors fall (Hanson, 2012). For example, countries with low labour costs such as Viet Nam and Cambodia have been moving into processing and specialising in raw material exports and labour-intensive manufacturing. Given their still low level of development, such specialisation has fuelled catch-up growth. However, their lag in more capital-intensive sectors might hinder future catch up, once they achieve middle-income status, unlike China and India, whose gains in capital-intensive sectors show they are gradually moving up the value chain. Furthermore, along with a high contribution of foreign value added in exports growth between 2000 and 2009, there were high increases due to domestic value added, indicating a move-up in the value chain in a number of

countries and the entry in value chains for others (Figure 2.3). For instance, the domestic value-added content of China's exports rose between 2005 and 2009, indicating a move up the value chain, while other low labour cost countries such as Viet Nam and Cambodia have moved into processing.

Figure 2.3. **Domestic activities have benefited so far from the integration into the global value chains, 2000-09**

% increases of foreign and domestic value added between 2000 and 2009, related to gross exports in 2000



Source: OECD (2013b), *OECD-WTO Database on Trade in Value-Added* (TiVA) (database), *www.oecd.org/industry/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm.*

StatLink http://dx.doi.org/10.1787/888933057666

There is room for further international integration and associated low-hanging fruits for developing economies

The still large income gap with advanced economies and the buoyant consumption of emerging countries' middle classes are cause for optimism that some per capita GDP convergence will continue in the foreseeable future (OECD, 2013a). To begin with, the relatively low level of per capita income in heavily populated countries such as China, India, Indonesia and Bangladesh suggests that there is plenty of scope for income convergence. Furthermore, the burgeoning middle classes in dynamic developing countries will be a lasting growth driver: by 2025 they will dominate global demand for most goods and services (Kharas, 2010; Kharas and Rogerson, 2012).

Competition for new customers is intense and growing. And, although it throws up challenges, it could encourage companies to rapidly increase their innovative capabilities and act as an incentive to diversify and upgrade domestic production. A number of developing countries are in still early phases of demographic transition, which may help them catch up with developed countries in the coming decades. Such countries are India and some other developing Asian nations, most countries in Africa and, to a lesser extent, in Latin America (see Chapter 1; Buiter and Rahbari, 2011).

If China continues to converge towards a high-income bracket in per capita income levels, it will open up opportunities for other developing countries. Higher real wages or real appreciation of the Chinese currency will continue to ease price pressures on

low-income countries while, at the same time, its technological upgrading will shift price pressures from middle- to high-income economies. And, as China and other large emerging economies prosper, export opportunities will improve for other developing countries, which could accelerate global growth (Chamon and Kremer, 2009; OECD, 2013a).

With opportunities, however, come challenges for developing countries. As the literature on crowded manufacturing sectors argues, the growth stemming from the middle classes' increasing consumption may be cancelled out by more intense competition and markets lost as the number of competitors grows. There are, for example, doubts over the future of manufacturing in Latin America, given structural factor endowments in China, such as labour and scale (Mesquita, 2006; Paus, 2009). Currently, China's upgraded industrial structure may present growing challenges to the competitiveness of the manufacturing sector in other upper-middle-income countries.[2] Beyond China, though, a number of poor, heavily populated like India or Indonesia are also converging, which may further challenge upper-middle-income economies.

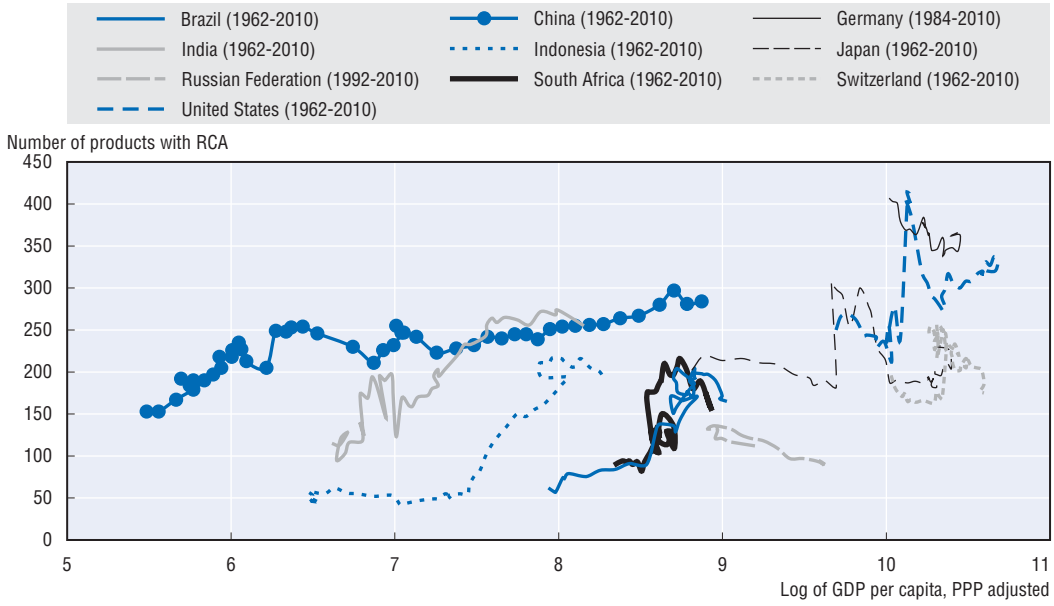
Need for diversification into higher value-added sectors

The current patterns of convergence, with significant specialisation in low technology sectors driven by comparative advantages, will likely allow many developing countries to continue converging. However, at the latest, when low-cost advantages are fading due to rising wages, which are driven by the limits of surplus labour, countries will increasingly have to diversify into higher value added and more technology-intensive sectors. Whereas diversification and sophistication (i.e. a higher value-added product structure of an economy) are partly the consequence of a country's overall competitiveness, market forces alone may not be sufficient to achieve them. Lower-middle-income countries are often specialised in natural resources or assembly activities. Then, most middle-income countries which successfully converged in a sustainable way towards higher income levels, progressively diversified towards new sectors and activities with higher value added, away from rents. A number of studies find a non-linear relationship between production diversification and the level of development: after a diversification at middle-income levels comes often a later stage of specialisation as, beyond a certain level of income, countries again become concentrated – whether in terms of employment, value added, or exports[3] (Imbs and Wacziarg, 2003; Klinger and Lederman, 2006; Hausmann and Rodrik, 2006; and Koren and Tenreyro, 2013). In the development process, diversification may continue up to relatively high income levels before countries once more specialise in high value-added activities. As a result, rich countries are more diversified than poor ones (also see Figure 2.4).

Such trends suggest that increases in sophistication, fed by economic diversification and labour productivity increases within sectors (and not only by sectoral shifts in labour) are stages on the development path, and that diversification and productivity can mutually reinforce each other. That path has been followed by countries like Korea which have conducted their convergence process with advanced economies well (Jankowska et al., 2012). While Korea gained comparative advantages in a significant number of sophisticated products – often in sectors with relatively low skills- or technology-related needs – Malaysia and the Philippines were able to build a comparative advantage in electronics only (Felipe et al., 2012).

Figure 2.4. **The shifting wealth process led to specialisation rather than to diversification**

Number of products with revealed comparative advantages (RCA) in selected countries versus log GDP per capita (PPP adjusted)



Note: Calculations based on SITC 4-digit product data.
Source: Authors' calculations based on UN Comtrade (2013), *United Nations Commodity Trade Statistics* (database), *http://comtrade.un.org/db/default.aspx* and Penn World Tables (2013), *Penn World Tables* (database), *https://pwt.sas.upenn.edu/*.
StatLink http://dx.doi.org/10.1787/888933057685

Diversification makes countries less vulnerable to shocks and allows faster adaptation

Economic diversification, associated with sophistication of production, is key to ensure sustainable competitiveness. It first makes countries less vulnerable to shocks. It may also make countries' economic structures more adaptable to longer term evolutions in comparative advantages in the world markets. Indeed, diversification – if it comes with sophistication of production – may go along with a more diversified skills supply, as well as with a range of productive firms among different sectors. Therefore the economy may be more capable to grasp rapidly new opportunities and to face challenges implied by changes in competitive edges. UNIDO's *Industrial Development Report 2009* identifies diversification and sophistication of production as the main drivers of middle- and low-income countries' competitiveness in the world market (UNIDO, 2009).

Conversely, over-specialisation may lead to rents, economic inefficiencies, and low incentive to invest in other sectors. Excessive specialisation in some economies also leads to issues of limited labour absorption capacity, with only a few productive sectors to take on high numbers of workers. In Latin American economies, sector shifts started to make a negative contribution to aggregate productivity in the 2000s. As for India, the labour force may increase by one million every month until 2020 (Goldman Sachs, 2010).[4] However, although the demographic dividend is a potential asset, it also poses challenges of education, sufficiency of jobs for new labour market entrants, and unrest if their expectations are not met. Countries which specialise in natural resources may face similar absorption difficulties, not to mention Dutch disease effects. All this points to the need for frameworks and policies to help diversification.

The size of the country however matters. While a large country cannot remain competitive without diversification, a small one cannot easily become competitive in multiple sectors, particularly if they are only loosely connected, i.e. use few similar skills or technologies (Haussman et al., 2007). Larger countries tend to trade in a more diversified range of products, thanks to their larger internal markets and higher degree of product differentiation (Cadot et al., 2011).[5]

Diversification into higher value-added products is not an automatic process

Notwithstanding recent convergence in GDP per capita, current globalisation patterns show that the sophistication and upgrading are not processes that should be taken for granted. In other words, diversification is not automatic. Specialisation forces generally prove stronger, which can lead to absorption challenges and rents. And where there is diversification, it is often in less productive sectors.

The "shifting wealth" process may have fostered specialisation at too early stages of development, hence not guaranteeing sustainable gains at middle-income. As an example regarding international trade, in the case of the BRIICS, except China and India (which are still far from high income levels), there were exports' specialisation for Brazil, the Russian Federation, Indonesia and South Africa, as witnessed by the decreasing numbers of products with revealed comparative advantages (RCA) (Figure 2.4). Although these trends may be driven by the increase in prices of natural resource (which directly affects the relative RCA of other products within a country, by favouring the natural resources in the share of exported products), they suggest that these countries need to foster diversification.

Countries which fail to converge in labour productivity sometimes find themselves specialising in unsophisticated products, which suggests that they do not evolve automatically towards greater sophistication. Some estimates provide support for the idea that countries unable to diversify and move up the value chain in their exports may eventually get caught in a middle-income trap (Felipe et al., 2010). For that purpose, 779 exported commodities were classified according to degree of sophistication as measured by the income content of the products exported and their "connectivity" to other products – a "well-connected" export basket is one that allows an easy switch to other exports. Of the 779 exports, 352 "good" ones and 427 "bad" ones were identified. 34 countries (mostly OECD ones) were found to have export baskets that contain a significant share of good products, while 28 are caught in a middle-product trap – i.e. a significant share of the products in their export baskets lie in the middle of the sophistication and connectivity spectra. Another 17 are caught in a middle-low product trap and 75 in the difficult situation of a low product trap, whereby their export baskets have a significant share of unsophisticated products that are poorly connected to other products.

Some countries' specialisation in low value-added sectors contrasts with their level of development or GDP catch up per capita in the 2000s. In Latin America, for example, Argentina, Bolivia, Chile, Ecuador, Paraguay, Peru, and Uruguay retained their specialisation in agricultural and mining products and may face a product trap. Indeed, Latin America has always had trouble promoting diversification and structural transformation and, therefore, maintaining a comparative advantage in manufacturing (OECD/ECLAC, 2012).

Catch-up growth over the last decade has been driven in most countries by specialisation which, in turn, may have been fostered by agglomeration effects and the geographic concentration of producers (conversely, China and India are striking examples of countries which managed to catch-up through a range of diversified sectors). In line with the theory of new economic geography, spatial concentration within a particular industry may have helped (Krugman, 1991; Gill and Kharas, 2007):

- Broaden the market for input suppliers, thereby allowing firms within an activity to exploit internal economies of scale in production (average costs decline as the scale of production rises). This sharing of inputs also allows suppliers to provide highly specialised goods and services tailored to the needs of their customers. The result is higher profits, accompanied by easier access to a broader range of inputs.
- Expand the availability of the skills that employers require to match their needs more easily and closely to their distinctive needs. At the same time, workers would prefer moving to locations where there are many possible employers.
- Accelerate knowledge spillover, allowing workers and entrepreneurs to learn from each other.

Diversification, when it occurred, has often been prompted more by the need to avoid competition than to increase productivity. In the 2000s, firms in a number of countries which could not afford to compete internationally with Chinese producers and lost market shares turned to other activities, frequently related to lower value-added products. And even when countries did improve their exports in sectors with higher technological input, there are doubts whether such diversification really involved domestic activities with high added value. Take Brazil, Colombia, Costa Rica, and Mexico, the few Latin American countries that showed improvements in exports in sectors with higher value added in the 2000s. Evidence suggests that those sectors were integrated into global value chains and that it was in their low added-value activities – e.g. assembly – that the countries specialised (Sturgeon and Gereffi, 2010; OECD/ECLAC, 2012). This type of trade specialisation also occurs frequently in developing countries, showing high levels of imports of intermediate products in the high-tech industries.

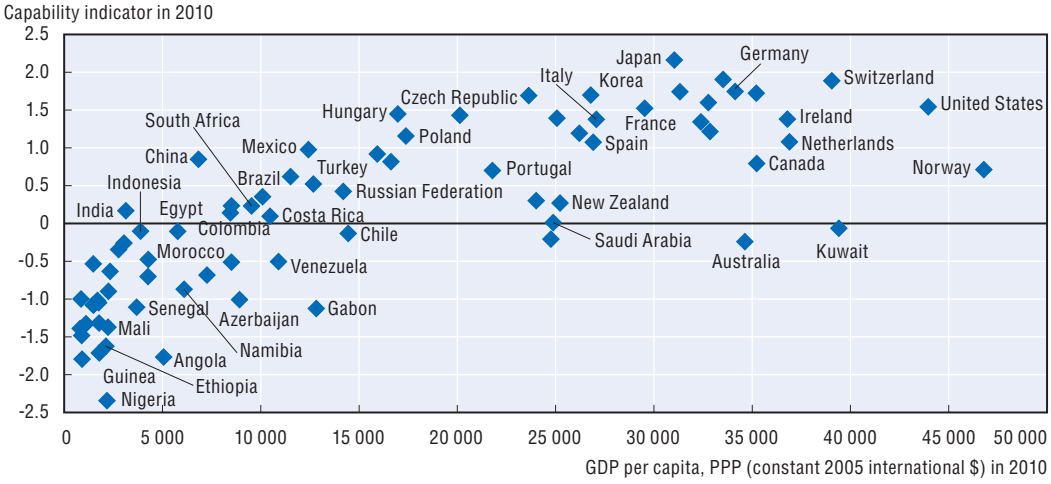
An indicator that classifies countries according to Hausmann's capability concept (see Annex) suggests that countries diverge widely in capability and many may not be able to achieve high-income status (see Figure 2.5 and figure note for explanation of Hausmann's capabilities). There is therefore a need for specific policies and frameworks.

Moving up the value chain requires specific policies

Diversification and moving up the value chain may require specific policy interventions aimed at developing infrastructure and at addressing possible market failures in many developing countries (Felipe et al., 2010). Integrating more fully into supply chains involves improving domestic and foreign connectivity through infrastructure. Any successful transformation strategy requires effective infrastructure planning and development to build the necessary domestic and foreign linkages. Significant gaps in the provision of infrastructure hold back competitiveness and the expansion of production in developing countries. They therefore need not only to invest more in infrastructure but, above all, to improve the effectiveness of their public infrastructure policies. Co-ordination between agencies that steer such policies is essential for bridging gaps, such as coverage, access, and costs. The challenges related to

Figure 2.5. **Production capabilities do not always match the level of development**

Hausmann's capability indicator of selected countries, versus GDP per capita (in PPP, constant 2005 international $), 2010



Note: The capability indicator is the combined ability of a country to produce goods that others do not produce (i.e. ubiquity) and the extent of diversification of its production structure captured by its exports. The two dimensions are combined by the so-called "reflection method" described in Hausmann et al. (2007). A value of zero in this measure means that a country has the same capabilities as the world average.

Source: Jankowska, A., A.J. Nagengast and J.R. Perea (2012), "The Product Space and the Middle Income Trap – Comparing Asian and Latin American Experiences", *OECD Development Centre Working Paper*, No. 311, OECD Publishing, Paris, *http://dx.doi.org/10.1787/5k9909j25879-en*.

StatLink http://dx.doi.org/10.1787/888933057704

infrastructure may depend on the level of development of the countries. According to a recent OECD Development Centre survey of policy-makers, the prioritisation and planning may be the most challenging phase for emerging economies, and less the execution phase (less developed economies – in particular LDCs – face even more difficulties at the execution phase in addition to difficulties in the prioritisation and planning). In many emerging economies, low technical capabilities for project design and the lack of a framework for policy implementation stand out as the most adverse factors: projects are implemented without preliminary analysis, and concession contracts awarded without definitive designs or prior land studies, often without property rights to the land. This is for instance the case in India where weak infrastructures, in particular rural areas, are a major bottleneck that limits access to markets. In the 2000s, Korea has addressed some of these challenges thanks to a strong political support, the creation of a specific budget with targets, and an enhanced co-ordination among stakeholders (OECD, 2013a).

Market failures may be country-specific and hamper the development of new firms and activities. For instance, Latin America's slowdown in productivity growth may be tied to the lack of focus on developing domestic technological capabilities and on diversifying production to move up the value chain (Paus, 2009). Moreover, the comparison of the cases of India, Saudi Arabia, the Russian Federation and Brazil shows that challenges related to diversification are multifaceted (Box 2.1). In many cases, they are related to institutions and public governance, coherence between education policies and technology absorption mechanisms, and policies aiming at providing equal opportunity and stabilising the rising middle classes. Therefore, the next three sections focus on these three core factors to improve competitiveness, which in return will allow productivity improvements and diversification.

Box 2.1. **The challenges of diversification into higher value-added sectors**

The challenges of diversifying production are multifaceted and country-specific. In many cases, they are related to institutions and public governance, coherence between education policies and technology absorption mechanisms, and policies aiming at providing equal opportunity and stabilising the rising "middle classes".

In **India**, the challenges encompass a range of issues, from education to regulation. The waves of young people that will enter the labour market in coming decades will be both an asset – a demographic dividend – and a challenge, as they need to be educated and decent jobs created for them. The service sectors that have driven growth in India in recent decades are currently far too small to absorb them. The Indian economy will have to diversify into a larger number of service industries while pursuing industrialisation so that there are sufficient numbers of jobs in manufacturing. There was some diversification 2000s, but creating jobs in the productive sectors for the large numbers of new, often scantly educated jobseekers will be a big challenge in the next years. Indeed, ensuring access to quality education for all and fostering inclusive innovation and technology absorption may well be the priority. In addition, an enhanced business climate through better regulation in the labour and product markets may contribute to reducing the currently high level of informality and to lifting productivity. Inequality may also rise sharply and become a growing concern as urbanisation and industrialisation – often associated with greater inequalities – continue apace. All these issues impinge upon political economy and multi-level governance due to the sometimes overlapping interactions between the federal and state-level governments in India.

Diversification is particularly crucial for economies rich in natural resources, helping them to mitigate the impact of exposure to volatility in prices and external demand and, even more importantly, to create productive jobs and ensure social stability. Governments need to play an active role, since market forces all too easily contribute to the Dutch disease effects of excessive specialisation in natural resources and deindustrialisation, through losses of competitiveness in the manufacturing activities, associated with large real appreciation of the domestic currency and large increases in wages across sectors, as well as through shift of investments away from manufacturing sectors towards the natural resource sectors. At the same time, greater government involvement requires mechanisms to frame efficient intervention and avoid regulatory capture and other forms of corruption. As examples, Saudi Arabia and the Russian Federation – both endowed with large oil and gas reserves – have accumulated foreign exchange reserves and invested them abroad, partly in order to mitigate the appreciation of their currency and avoid harming their competitiveness. Both countries have also implemented policies specifically designed to support diversification.

Saudi Arabia has long sought to diversify its economy. Some policies have run into trouble, particularly the size of subsidies for irrigation in agriculture in the 1980s and 1990s and in sectors where protectionist policies associated with state contracts to foster local private industry were implemented. New policies in the 2000s focused on attracting private and foreign investment, sometimes in partnership with public investment. The new framework helped attract large private investment in new manufacturing and industrial sectors, mainly in those that use hydrocarbons (e.g. the petrochemical industry), since investors benefit from oil prices that are much lower than on international markets and offer a competitive advantage. In contrast, the development of industrial clusters (in the automotive sector, for example) lags behind, which raises questions regarding the design and efficiency of the policies undertaken. Finally, a break with the monopoly of the past in 2004 has fostered greater competition in the telecommunications sector and attracted private investment.

Box 2.1. **The challenges of diversification into higher value-added sectors** *(cont.)*

The **Russian Federation** has seen large employment shift from manufacturing to the rising services sectors. Yet its share of the world manufacturing export market still increased slightly in the 2000s due to some productivity increases as well as a booming internal demand, and despite high wages increases. Beyond the development of services, there were some signs of diversification in manufacturing, but the extent of diversification remains one of the biggest challenges to development. The low level of high-tech exports also raises concerns when set against the Russian Federation's high tertiary education attainment rates and its overall level of development. Strong past dependence on heavy industry, weak integration into global value chains, and the need for greater coherence between private sector needs and educational syllabuses – particularly at tertiary level – may be key issues. Also important is the need to clearly delineate the role of the state in the economy. In the 2000s, barriers to entrepreneurship tumbled, the list of "strategic" sectors was shortened, and the scope of rules governing those sectors was clarified. Yet, the state intervenes unpredictably in private sector activities, prompting wariness among investors. Current considerations in diversifying the economy include: the possible use of existing industrial conglomerates to foster diversification; the reliance on completely new sectors or activities through, for instance, an improved business climate; the building of special economic zones (SEZs) and clusters; and the mitigation of long-term risk for investors by using foreign exchange reserves as a guarantee of the state's commitment to lower investment risks. Boosting economic diversification and up-grading is key to sustain rapid catching-up with more advanced economies, and is among the priorities of policies.

In **Brazil**, also endowed with natural resources, productivity fell in manufacturing over the last decade and stagnated in the services. Associated with higher wages, this slowdown resulted in a loss of competitiveness in both manufacturing and the services. The country's share of manufacturing exports has dropped significantly in the past 20 years, while increasing in food, fuel, and ores and metal, leading to specialisation in natural resources and feeding fears of deindustrialisation. The lack of a sound business environment and the high cost of domestic borrowing has translated into relatively low private investment. Relatively high taxes, red tape, infrastructure bottlenecks, and the third-highest average electricity tariff in the world (the "Brazil cost") are also barriers to upgrading and investment in new sectors and activities. Increasing interventionist government measures may also sour business confidence and increase uncertainty if they do not improve their targeting. Further challenges are related to the participation of the "middle class". After the economic difficulties of the 1990s, the creation of jobs in the 2000s helped narrow wide inequality and broaden the "middle class". However, persistent inequality of opportunity and poor access to quality public services (particularly secondary education) prevent a sizable proportion of the population from accessing adequate education and training and from taking advantage of the opportunities within society – in particular, better jobs. The result is social tension, which reduces the incentive to acquire skills and could, if not tackled, lead to instability. The "middle classes'" difficulty in participating fully in the economy makes it more difficult to modernise and to foster upgrades of the manufacturing sectors. Against this background, a high-priority objective is to stabilise the "middle class".

Strengthening product, labour and financial market institutions and public governance

At the middle-income level, previous drivers of growth such as factor accumulation and low wages are progressively vanishing. Therefore, countries increasingly have to move up the value chain to remain competitive or gain back their competitiveness (see Chapter 1). They must develop more efficient production processes and increase product quality because wages rise and producers still cannot raise their prices. At lower-income levels, countries start with a factor-accumulation type of growth. Once they reach middle income, they should progressively enter an efficiency-driven stage of development. At this point, competitiveness increasingly hinges on the efficiency of institutions and mechanisms governing goods, labour markets, and financial markets.[6] The government should offer the right incentives to invest in new high-productivity sectors and activities and factor new and existing interest groups into governance mechanisms in order to achieve more balanced decision-making processes.

Governments have taken steps to boost productivity through market mechanisms and more efficient institutions

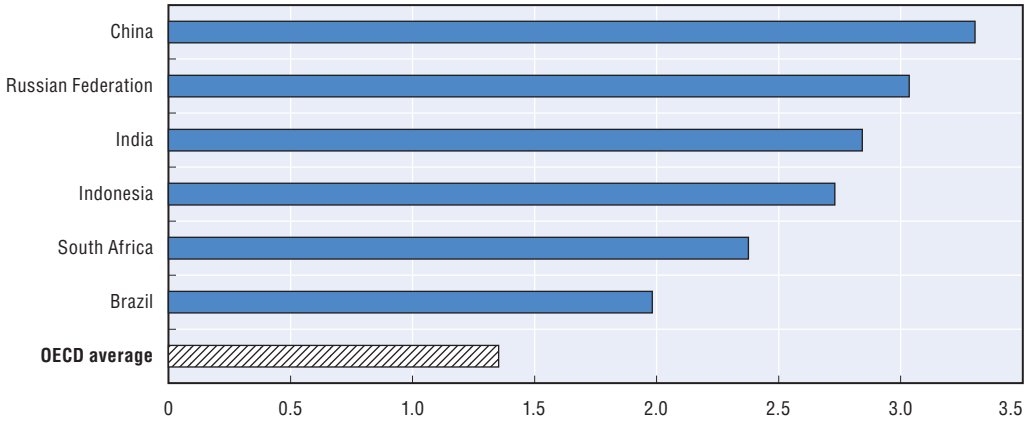
To improve competition and reap productivity gains, a number of countries have undertaken economic liberalisation policies. Key reforms include, for instance, increasing private-sector participation and removing entry barriers, privatising state-owned enterprises (SOEs), and removing subsidies. Competition, if well managed, is an efficient productivity tool: firms strive to be more productive to increase their revenues or escape competition, productive new businesses enter the market, and inefficient ones drop out. Competition can also be a powerful incentive that spurs companies to innovate and differentiate themselves from their competitors (see Chapter 3). According to some assessments (Johansson et al., 2012; OECD, 2013c), further product market liberalisation could boost productivity in emerging economies– which includes the BRIICS – which have relatively high barriers to competition, trade, and investment for both domestic and foreign firms (Figure 2.7A).

Financial sector liberalisation has been introduced to foster entry and competition in the financial sector and so improve the sector's efficiency and reduce the cost of borrowing. Banking systems in a number of emerging economies have been transformed in this way since the 1990s with efficiency and performance improving, apparently in response to a more competitive climate. India's banking sector reform, associated with trade liberalisation, has improved aggregate productivity in the manufacturing sector and reallocated funding from the least to the most productive firms (Bas and Bertou, 2012). In the Russian Federation, a large number of banks have come into being since the 1990s, although some failed or were absorbed in the 2000s. Nevertheless, the country's banking system has stabilised and access to capital has improved dramatically. In many emerging economies, bank sectors saw the inception of more standardised risk assessment mechanisms, which contributed to an improvement in their efficiency and stability.

Emerging countries remain, however, wary of liberalising some sectors which they consider of strategic importance to the economies (e.g. with externalities that foreign, or even domestic, firms do not care for), or where they fear that heightened competition may have negative effects on domestic producers (OECD 2013a). Overall product market regulation, particularly state control, remains high in large emerging economies

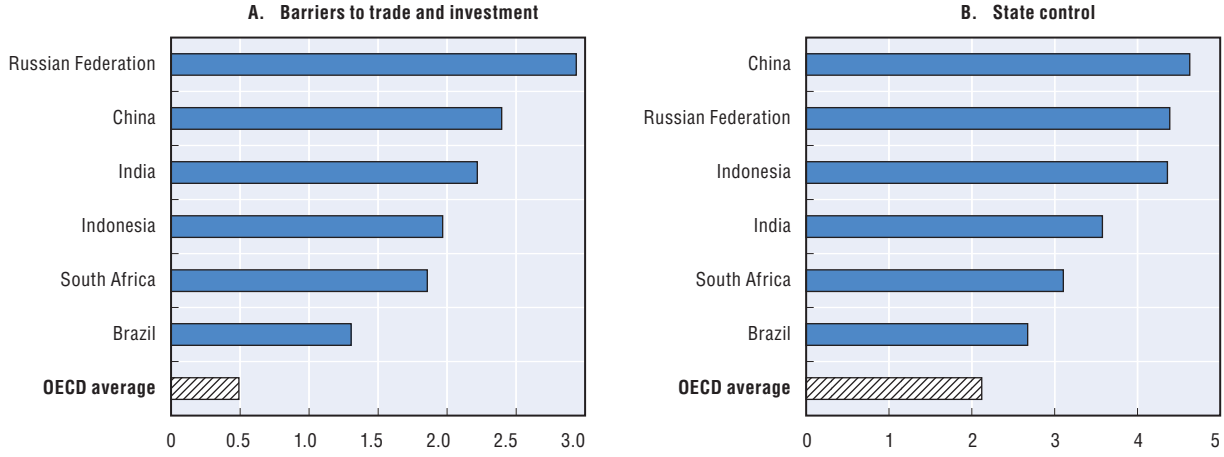
(Figures 2.6 and 2.7B). For instance, in the financial sector, rather than engaging in full scale privatisation, countries like China and India are only partly and gradually transferring ownership of major state-owned banks to the private sector. Although the Russian Federation allows foreign banks into its banking sector, its major state-owned banks are the big operators, while Brazil's large public development banks like BNDES, the Brazilian Development Bank, play an important part in the economy.

Figure 2.6. **Product market regulation is higher in emerging economies than in OECD**



Note: Index scale of 0-6 from least to most restrictive. A higher indicator means a higher degree of regulation. Product market regulation includes aspects of state control, barriers to entrepreneurship and barriers to trade and investment.
Source: OECD (2011a), *Product Market Regulation* (database), *www.oecd.org/economy/pmr*.
StatLink http://dx.doi.org/10.1787/888933057723

Figure 2.7. **Barriers to trade and investment and state control are higher in emerging economies than in OECD**



Note: Index scale of 0-6 from least to most restrictive. A higher indicator means a higher degree of barriers to trade and investment or state control. Barriers to trade and investment include aspects of barriers to FDI, tariffs, discriminatory procedures, and regulatory barriers. As a sub-category of product market regulation, state control includes aspects of public ownership and of involvement of the state in business operations.
Source: OECD (2011a), *Product Market Regulation* (database), *www.oecd.org/economy/pmr*.
StatLink http://dx.doi.org/10.1787/888933057742

There is also a need for product market regulations which protect consumers and have the capacity to prevent regulatory capture. Those that protect consumers – by strengthening quality and safety standards and consumer information – can heighten trust in domestic products, which ultimately benefits domestic producers – particularly in developing economies, where foreign products may enjoy better reputations than domestic ones. So, despite already high levels of product market regulation in countries like India, there is demand for even more regulation in some sectors. The problem arises when public organisations lack the capacity to draw up or enforce sound regulation that affords effective consumer protection without raising barriers to entry. Companies that already supply goods and services may capture regulatory bodies to avoid new entrants, which will stifle entrepreneurship and incentive to increase productivity. In many countries, there are also concerns over the institutional setting of the regulator or fair trading authority and its independence.

Product market regulation may encompass a range of issues, from the improvement of the business climate to the avoidance of concentration. In the Russian Federation, for example, there is a need to improve property rights and the business climate, and to clarify state involvement in private business. In Indonesia, the cost of setting up and operating businesses is high, while contract and property right enforcement is weak and needs to be harmonised across the country's regions. Issues in Colombia are contract enforcement and the time it takes to resolve commercial disputes.

In many countries, productivity is also hindered by excessive concentration in certain sectors – whether the legacy of past monopolies or oligopolies or the result of market forces. South Africa's heavily concentrated sectors and large enterprises (in manufacturing and the services) are inherited from the past, yet still make it difficult to improve competition. Slovenia's vertically integrated food sector delivers high concentration and low competitive pressures, while in Hungary, collusion, oligopolies, and excessively fast privatisation hinder competition.

More efficient labour market regulation is also key to ensuring that wage rises do not outpace productivity increases. In the last 15 years, labour productivity increases have accommodated real wage rises in some countries and have helped create a domestic consumer class. There are other instances, however, of wage hikes cancelling out productivity gains. Sluggish productivity and the real wage uptrend in Brazil, for example, account for much of the overall loss of competitiveness (Canuto et al., 2013).[7] In the Russian Federation, labour productivity in manufacturing climbed by more than 60% between 2002 and 2010, but a significant increase in labour costs, driven by high inflation, prevented the sector from significantly enhancing its market share (UNIDO, 2012). Studies also suggest that China is reaching the Lewis turning point, a point at which it would move from a vast supply of low-cost workers to a labour shortage economy, with increases in real wages that may impair competitiveness (Huang and Jiang, 2010). Economies endowed with natural resources are particularly affected by wage rises that outstrip productivity gains, with competitiveness inhibited by market forces that push wages up across the board through Dutch disease effects.[8]

Rapid economic and social transformation in catch-up economies call for labour market institutions that can facilitate wage setting and stem informality. Whereas bargaining at the national level can ensure unemployment is taken into account when setting wages, decentralised bargaining at firm level may yield greater flexibility in link wages to productivity increases. Striking the right balance may depend on levels of unemployment and informality within the country.

Finding the appropriate balance in employment protection legislation is crucial

There are also fears that overly restrictive employment protection legislation (EPL) might lower aggregate employment or reinforce informality (OECD, 2011b). The evidence for employment demand is mixed across countries, suggesting that aggregate employment may depend primarily on other factors and that there are wide differences in the way that countries enforce EPL. In Latin America, the evidence is mixed (Freeman, 2009). Legislation exerts sizeable effects on unemployment in Colombia, for example, but not in Chile. Colombia's large informal sector also shows particularly low productivity and formalising it is key to raising aggregate productivity. Findings from cross-country analysis do not always coincide with those of time-series or panel studies (see Kucera and Xenogiani, 2009). The inference is that measures of job protection legislation and its cost across countries tend to hide important differences in implementation. Negative effects may be explained by the fact that Latin American economies tend to have more costly job security provisions than in other regions (Heckman and Pagés, 2000).

In contrast with the modest aggregate effects observed in Latin American countries, India's stringent EPL drives workers and output from the formal to informal sector and brings them few gains (Besley and Burgess, 2004). Similarly, findings that link the regulatory burden to the size of the informal economy can be interpreted as representing how labour is regulated (especially through firm entry) rather than how much it is regulated (Kucera and Xenogiani, 2009). The effects of labour regulation on employment outcomes also depend on enforcement, which is typically imperfect. Increased enforcement efforts in Brazil lead to lower rates of informality but also to more unemployment and smaller firms (Almeida and Carneiro, 2009). In Indonesia during the 1990s, greater compliance with minimum wages was key to higher pay in the textile, footwear, and apparel industries (Harrison and Scorse, 2010).

Over-stringent EPL may also curtail turnover in the labour market and so create barriers to the absorption of labour reallocation across sectors as well as between firms. Studies of changes in EPL in Chile and Colombia do find that weaker EPL is associated with declines in job tenure, higher separation rates, and increased hiring in the formal sector (Freeman, 2009). Using a firm-level dataset for a set of 16 industrialised and developing countries, Haltiwanger et al. (2008) find that, although industry and firm size account for a large share of employment flows, labour regulations are associated with lower employment flows. If labour legislation reduces the ability of firms to adjust their workforce accordingly, particularly in downturns, it may have effects on aggregate performance.

Lower employment flows may make it difficult to absorb new labour entrants by lengthening the time it takes them to find a job. Although job seeking may be just a transitional difficulty for many young people, those who stay unemployed for long periods may develop disadvantages that will affect them permanently throughout their careers. One possible solution is the creation of specific employment contracts with limited protection for the young. However, such measures produce dual labour markets – albeit in a different form from the divide between formal and informal employment – which can trap jobseekers in fixed-term contracts and dim prospects of upgrading human capital. If labour regulations generate dual labour markets, the brunt of adjustment is felt mostly in the more flexible, and usually more unprotected, market.

The right incentives to invest in new sectors and to increase productivity are needed

Economic stability is important to investment in new sectors, as volatility puts off investors who fear uncertainty of returns on their investment. Wide fluctuations in real effective exchange rates, for example, can thus undermine foreign and export investors' incentives to invest in non-traditional sectors (Williamson, 2000; McKinsey, 2009). In this sense, long-term competitiveness requires smoothing out sharp fluctuations, as China and the Russian Federation have done. Both countries have accumulated foreign exchange reserves and are investing them abroad so as to ease exchange rate volatility and currency appreciation. China's financial liberalisation may facilitate capital outflows, which could also help mitigate real appreciation in the value of the renminbi.

Where private players are reluctant, the state can take long-term risks, both in diversifying into new sectors to avoid rent seeking and in expensive, long-term technology upgrades. Private firms are particularly loathe to take on risk in developing countries where long-term funding is scarce due to frequently low levels of financial intermediation. Small firms seeking bank loans for external funding are the worst affected. Plugging this financing gap are domestic development banks, which have gained importance as instruments for facilitating access to credit.

The number of banks proposing programmes for small and medium-sized enterprises (SMEs) has grown in the last decade, particularly in Latin America where privatisation and foreign entry curbed SMEs' access to credit (OECD 2013a). Domestic development banks in non-OECD economies have focused on the SME sector through different channels – capital goods, working capital, and investment – directed at improving productivity or complying with environmental regulations. For instance, the National Development Bank of Brazil and the Industrial Development Corporation in South Africa have introduced new financial mechanisms to stimulate innovation in specific fields of national interest. Credit guarantee schemes (CGSs), both public and private (some private CGSs are matched by a public counter-guarantee), have also grown significantly over recent decades in OECD and non-OECD countries (Beck et al., 2008). Governments use them as tools to ease the financial constraints on SMEs and start-ups.

It is important to ensure both the long-run financial sustainability and additionality of public mechanisms for supporting SMEs without which many would not obtain financing loans. Regarding financial sustainability, it is important that the support is provided to firms with good competitiveness prospects. Additionality also ensures that public support does indeed ease SMEs' access to finance and does not go to swell undue profits or distort the market. For instance, a Credit Guarantee Scheme has been launched in Indonesia in the 2000s and has been increasingly active, but there have been raising concerns regarding the need to better monitor its operations so as to provide guarantees only when it can really ease access to credit. Indeed, it appears that some firms which have received a guarantee may have not needed such guarantees to have access to external credit under normal conditions. Providing such guarantees at a large scale could result in market distortions.

When market forces fail to attract the investment needed for catch-up growth, it may be time to use purpose-designed regulations. For instance, a country's "distance to the frontier" matters in the selection of appropriate growth strategies. Countries at early stages of development follow an imitation-based development model. They optimally pursue an investment-oriented strategy, which relies on firms and managers to maximise investment.

Such a strategy may benefit from supportive policies such as limits on product market competition or investment subsidies (Acemoglu et al., 2006), since the effects of rapid product and labour market liberalisation, trade, and FDI tend to be significantly weaker below a certain per capita income threshold (Wölfl et al., 2010). Emerging and developing countries must therefore exercise great caution when importing deregulation and liberalisation policies that have worked in OECD countries. Irrespective of the stage of development, regulation which limits competition may ensure that returns on investment are sufficient and provide incentive in sectors that have comparatively high investment costs.

Some countries have introduced policies that support targeted sectors or activities so as to enhance and diversify their comparative advantages, although the effectiveness of such measures is open to debate (OECD, 2013a). Whereas centralised industrial policies may be effective in mitigating over-specialisation in some sectors (as has happened in countries where natural resources are state controlled), effective diversification, together with improvements in labour productivity, requires well co-ordinated industrial policies that bring together a range of actors to let market mechanisms single out the most promising firms. Indeed, once countries are closer to the technological frontier, they need to innovate. In this regard Aghion et al. (2012) suggest that, instead of "picking the winner" from among existing monopolies, competition should initially be prioritised to identify the most competitive sectors or production activities. Then, industrial policies would support the ones which have proven to be competitive. The authors argue that, by forcing firms to operate in the same sector, sector-based policy spurs them to innovate vertically rather than simply to differentiate so as to escape competition.

Governance mechanisms to prevent regulatory capture

Governance mechanisms may incorporate entrenched and emerging interest groups in order to prevent them distorting the market or capturing government agencies. Such mechanisms are not proper to democracies. Indeed, Besley and Kudamatsu (2007) have shown that in autocracies they produce both better (Singapore) and worse (Zimbabwe) sustained growth outcomes than democracies. Outcomes in fact depend on how accountable government agencies are for their performance to a "selectorate" with the power to remove poorly performing officials from office. However, the ability of autocracies to maintain a merit-driven selectorate is questionable, given the predominance of patronage. Furthermore, even if it is merit based, governance mechanisms for consulting different interest groups are needed to ensure sound, balanced decisions.

Transparency mechanisms are also key to preventing corruption and regulatory capture. More standardised processes in areas related to public procurement, for instance, help to improve transparency, as do greater public availability of information and strong oversight mechanisms. Establishing fiscal councils or national audit offices with effective powers to amend decisions could also contribute to increased transparency.

China has recently made the fight against corruption a government priority, while the lack of transparency and accountability persists in India. There is a particular need for independent regulators and anti-corruption agencies with greater powers. Although Brazil, Colombia, the Russian Federation and South Africa ratified the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, corruption is still an issue in those countries. In resource-rich economies, opportunities for rent-related corruption are particularly plentiful. Bribery, rent-seeking, and mismanagement

are rife in Nigeria and remain a stark issue, even though the government has created agencies and committees to address corruption. As for Colombia and the Russian Federation, they score high on Transparency International's Perceived Corruption Index 2012. It may well be useful to legislate for whistle-blower protection to ensure that those who expose corruption and wrongdoing are kept safe from reprisals. Such protection is more difficult to implement in small countries, where interest groups form cartels and whistle-blowers are more easily identified and denied further job opportunities.

Closer coherence between education and technology policies

In addition to more efficient institutions and public governance, tighter coherence between education policies and technological absorption mechanisms would contribute to an upgraded, more diversified economy. In many middle-income countries, recent improvements in educational attainment and deeper integration into value chains have often not been sufficient to ensure the competitiveness of the labour force and continuously increasing market shares. This suggests that education and technology policies need to be framed in coherence with each other.

Breaking into high-income groups requires adaptable education systems

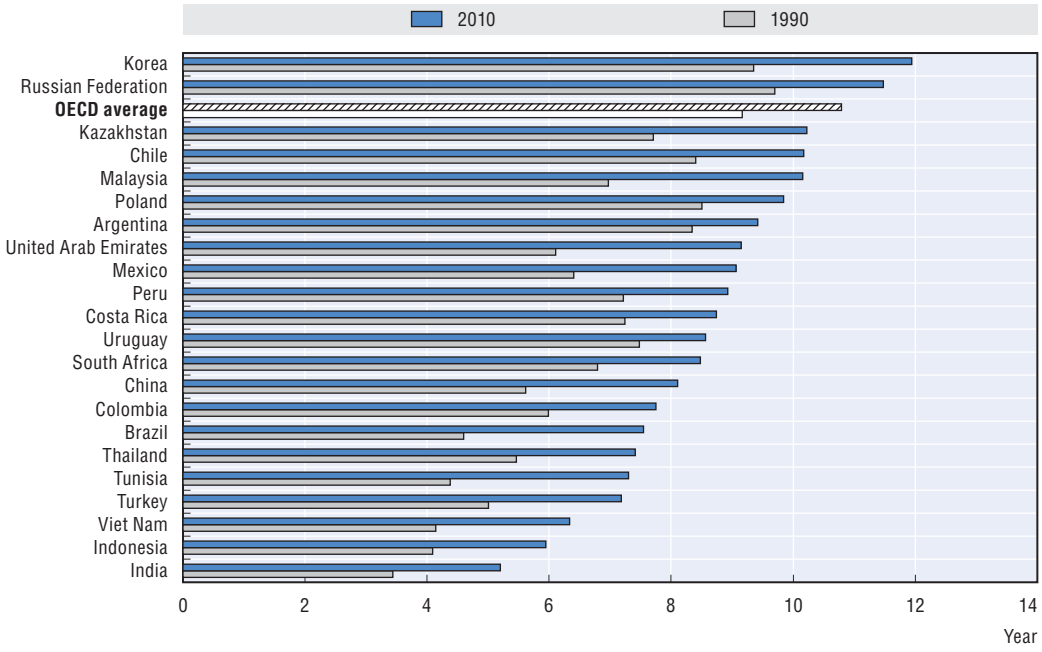
Educational attainment has progressed continuously in many emerging economies in the last decade (Figure 2.8). The strikingly higher attainments of secondary and tertiary education could yield a larger crop of skilled labour at competitive labour costs and increase the share of young people in good jobs.

However, the quality of education is still lower in most emerging and developing countries than in advanced ones, while inequality of opportunity erodes the incentive to acquire skills and leaves potential resources lying idle. As an example, the Programme for International Student Assessment (PISA) ranked Brazil 58rd out of 65 surveyed countries in 2012 in Mathematics, Colombia 62nd and Indonesia 64th. Conversely, Shanghai (part of China) – for which the survey has been specifically conducted – was ranked 1st and Viet Nam 17th, which underlined the differences in outcomes. The Russian Federation was classified 34th (see Table 2.1). In India, local government manages primary and secondary education with few resources, resulting in poor standards of education and low attainment rates. High drop-out rates, low student attendance, and teacher absenteeism are serious issues. With private education accounting for a rising share of enrolment, the poor have little access to good education. In addition to the skills acquired, primary and secondary education is affected by social externalities of socialisation and inclusiveness. Hence the great need to improve the poor's access to education and to make teachers more effective through better training, social recognition, and stronger incentives, e.g. adequate wages and benefits such as pensions. Teachers' accountability should be also enforced through evaluation mechanisms.

Mismatches between skills offered and the needs of the economy limit employment opportunities and increase costs. In a number of African economies, for instance, tertiary education is oriented towards human sciences, which results in shortages of trained engineers and high hiring costs for firms. Gelb et al. (2013) find that African industrial labour costs are high relative to workers' productivity levels, an effect that seems to be more pronounced for firms with high value added per worker and which use little capital. Labour-intensive manufacturing growth is therefore particularly challenging, with limited job creation and slower reallocation of resources across sectors away from agriculture into higher-productivity manufacturing and services.

Figure 2.8. **Education attainment in emerging economies is nearing OECD levels**

Average years of total schooling, age 15+, total, 1990 and 2010



Source: World Bank (2013), *World Development Indicators 2013*, World Bank, Washington, DC, *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933057761

Table 2.1. **The quality of education remains relatively low in many emerging economies**

PISA scores by categories for selected countries and OECD average

	Mathematics		Reading			Science	
	Mean score in PISA 2012	Ranking (out of 65 entities)		Mean score in PISA 2012	Ranking (out of 65 entities)	Mean score in PISA 2012	Ranking (out of 65 entities)
OECD average	494	-	OECD average	496	-	OECD average	501	-
Shanghai-China	613	1	Shanghai-China	570	1	Shanghai-China	580	1
Korea	554	5	Korea	536	5	Korea	538	7
Poland	518	14	Poland	518	10	Viet Nam	528	8
Viet Nam	511	17	Viet Nam	508	20	Poland	526	9
Russian Federation	482	34	Russian Federation	475	41	Russian Federation	486	37
Turkey	448	44	Turkey	475	42	Turkey	463	43
United Arab Emirates	434	48	United Arab Emirates	442	46	United Arab Emirates	448	44
Kazakhstan	432	49	Chile	441	48	Chile	445	47
Thailand	427	50	Costa Rica	441	49	Thailand	444	48
Chile	423	51	Thailand	441	47	Costa Rica	429	51
Malaysia	421	52	Mexico	424	52	Kazakhstan	425	52
Mexico	413	53	Uruguay	411	54	Malaysia	420	53
Uruguay	409	55	Brazil	410	55	Uruguay	416	54
Costa Rica	407	56	Tunisia	404	56	Mexico	415	55
Brazil	391	58	Colombia	403	57	Argentina	406	58
Argentina	388	59	Malaysia	398	59	Brazil	405	59
Tunisia	388	60	Argentina	396	60	Colombia	399	60
Colombia	376	62	Indonesia	396	61	Tunisia	398	61
Indonesia	375	64	Kazakhstan	393	63	Indonesia	382	64
Peru	368	65	Peru	384	65	Peru	373	65

Source: OECD (2013d), *Education at a Glance 2013: OECD Indicators*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eag-2013-en*.

Education and skills policies should address the issue of coherence between investment in skills and technological needs in the economy so that education expenditure does not turn out to be a waste of resources (OECD, 2013a). Indeed, converging economies often follow imitation-based development strategies. They do not therefore require the same type or amount of investment in advanced education as countries close to the technological frontier (Aghion et al., 2005). As an example, a study of the long-term growth effects of educational spending in the 50 states of the United States shows that returns to education spending are higher when states distant from the technological frontier invest in technical education and when states at the technological frontier invest in research-type education (Acemoglu et al., 2006).

Countries should therefore make their education systems more flexible. To that end, they should assess the skills needs of their economies with surveys, including those directed towards firms, and then allocate public funding accordingly, especially in tertiary education and vocational training. Greater autonomy may also add to efficiency in some countries. India, for example, should address the inadequate standards of its higher education graduates by granting institutions and state-level education authorities greater autonomy and strengthening quality assessment. Autonomy must be balanced. In Costa Rica, for example, too much autonomy has resulted in mismatches between the skills needed for up-grading and educational syllabuses. Balanced autonomy for tertiary education institutions could be combined with greater interaction between them and the private sector to deliver greater flexibility. For instance, stronger co-operation involving business may be useful when defining the curricula, and training-on-the-job could be developed. The Russian Federation, for example, boasts high educational attainment and literacy, yet its tertiary education needs the flexibility to match skills needs and market demands. Government spending on education and research and development (R&D) is to rise significantly between now and 2020, and curricula are being revised accordingly. In addition, the sheer pace of the transformation of emerging and developing economies will change the types of education and skill mix required for the economy to be competitive. Against that outlook, the government should respond by encouraging life-long training. In fact, the government has a key role to play, as firms may have little incentive to finance training for their employees if they are then hired by competitors (see also Chapter 3).

Policies should facilitate technology acquisition and innovation

To build domestic capabilities, emerging countries should not only seize the opportunities to upgrade afforded by value chains, they should go even further. Fuller integration in supply chains is not sufficient. A number of countries have been trapped in low value-added activities with little FDI spill-over into domestic capabilities, although they attracted investment from foreign firms (see Chapter 3). They should, for example, seek to identify and upgrade potentially competitive sectors by acquiring and absorbing technology and facilitate the progressive competition of these sectors in the international marketplace.

Innovation, i.e. the capacity to create new and better products and services, as well as new business models, is increasingly needed to sustain productivity growth and to compete effectively in global markets, once middle-income economies become more advanced and cannot rely on low costs to the same extent as before. In this context, in addition to continue to accumulate capital and labour, emerging and developing economies are also increasing their innovation capabilities. An important element of this is to develop effective means of taking advantage of technology and knowledge that

already exists elsewhere in the world. This involves making effective use of FDI, imports of technology embodied in capital goods and components; technology licensing; getting technology, designs, production and management assistance from foreign buyers, consulting firms, and technical experts; foreign education and training; tapping their Diasporas for technical and management knowledge; trade fairs, technical conferences, databases; copying and reverse engineering products and services, among others.

Among the BRIICS, China has been the most systematic in adopting policies to global knowledge through these various means (World Bank/OECD, 2009); for example in formal technology licensing. China more than tripled what it paid for technology between 2005 and 2012. Its payments are more than twice those of the Russian Federation, five times those of Brazil, six times those of India, and nine to ten times those of South Africa and Indonesia. In addition, China has also tapped global knowledge through a policy of sending students abroad for tertiary education. China has sent millions for education abroad. It has the largest number of students in the world at the tertiary level studying outside their home country, 567 000 (15% of the world total). This compares to 223 000 from India (5% of the world total), is 20 times more than Brazil and 90 times more than South Africa (Table 2.2).

Table 2.2. **China is tapping global knowledge through different channels**

Selected indicators of tapping global knowledge as well as of domestic generation of knowledge for the BRIICS

	Brazil	China	India	Indonesia	Russian Federation	South Africa
Payments for the use of intellectual property (USD million)						
2005	1 405	5 321	961	672	1 533	1 071
2012	3 666	17 749	2 820	1 800	7 629	2 017
Students at tertiary level studying abroad						
2000	17 481	140 642	55 875	32 082	28 034	5 391
2005	19 631	402 941	139 566	30 059	38 948	5 473
2012	27 926	567 574	202 778	34 471	49 769	6 321
R&D personnel						
2000	73 909	691 518	114 656	44 045	504 852	14 032*
2005	109 510	1 115 384	153 075	No data	462 338	17 088
2010	129 269	1 149 161	No data	21 281	438 695	19 177**
Expenditure on R&D (USD billion, PPP)						
2000	656.5	1 081.9	356.0	11.2	272.7	87.0*
2005	856.9	2 989.9	650.0	No data	815.9	222.5
2010	2 486.8	10 431.7	938.3***	45.0****	1 766.8	248.1****
Scientific and technical journal articles						
2000	6 407	18 479	10 276	182	17 180	2 221
2005	9 897	41 604	14 635	205	14 425	2 395
2009	12 306	74 019	19 917	262	14 016	2 864
Triadic patents						
2000	29.5	71.6	53.8	3.5	72.5	37.3
2005	27.3	292.4	101.2	0.9	50.4	24.4
2010	0.6	35.3	27.8	0	5.3	0

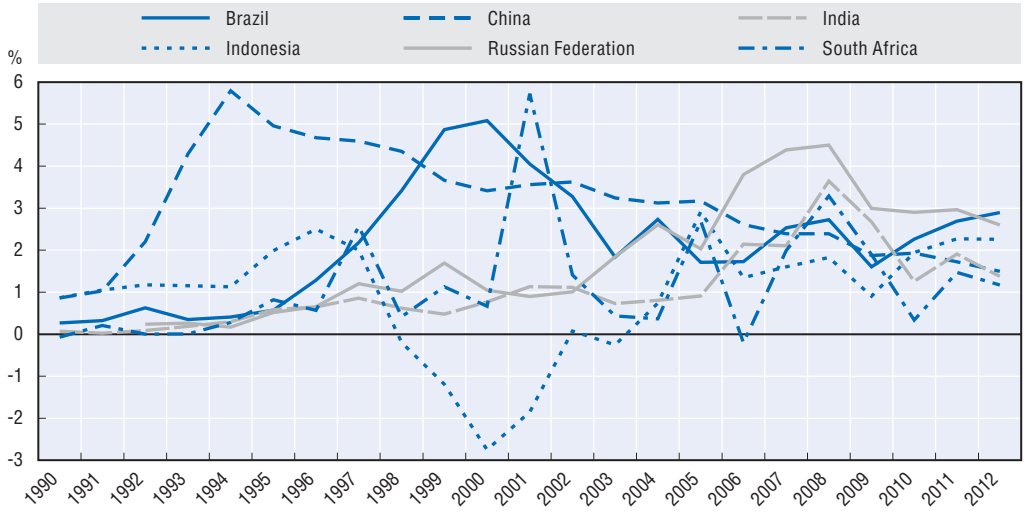
Notes: * Figure from 2001; ** Figure from 2008; *** Figure from 2007; **** Figure from 2000.

Sources: Authors' calculations from World Bank (2013), *World Development Indicators 2013*, World Bank, Washington, DC, *http://data.worldbank.org/data-catalog/world-development-indicators*; UNESCO Institute for Statistics, *www.uis.unesco.org/Pages/default.aspx* and OECD (2013e), *OECDstat* (database), *http://stats.oecd.org/Index.aspx?lang=en&SubSessionId=0dbfe8ee-3a8b-48a8-b436-112a63797b98&themetreeid=-200*.

China also had a strong policy of using foreign direct investment (FDI) to get access to advance technology and management as well as to get access to foreign markets. FDI inflows accounted for 4% to 6% of GDP for China in the mid-1990s. They were also important for Brazil from 1998 to 2002, for the Russian Federation from 2006 to 2009, very briefly in South Africa in 2001 and have become important for India since 2006 as part of its more recent liberalisation (Figure 2.9).

Figure 2.9. **Although to a different extent, most BRIICS are tapping global knowledge through foreign direct investment (FDI) inflows**

FDI inflows as a share of GDP in the BRIICS, 1990-2012



Source: Authors' calculations based on UNCTADStat database (2014), *http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx*.

StatLink http://dx.doi.org/10.1787/888933057780

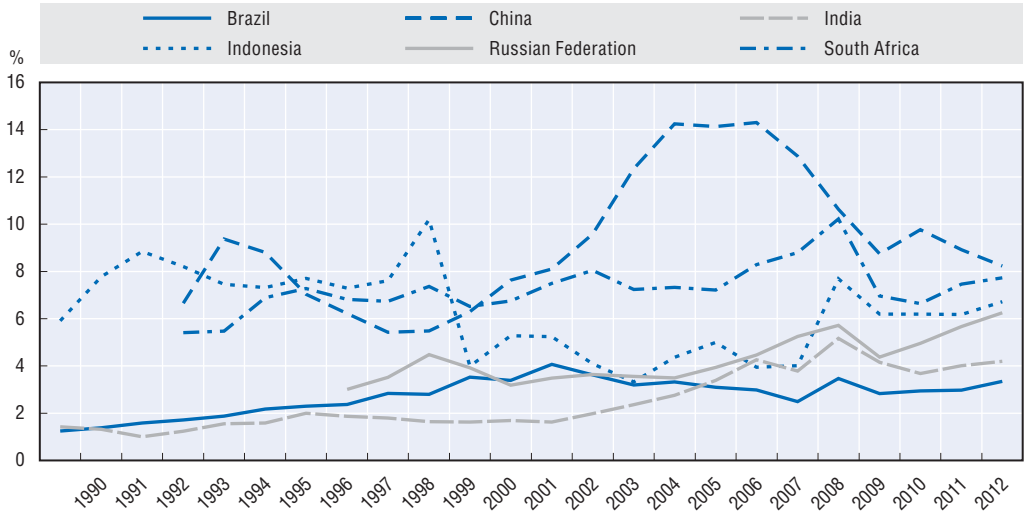
Another important source of knowledge is technology embodied in capital goods (Figure 2.10). As noted earlier, capital goods imports have been much more important for China than for the other BRIICS. South Africa has also made intensive use of capital goods imports. The Russian Federation has started to do this more recently. Starting from very low use of capital goods, India has been drawing much more on them since 2000 while Brazil has not.

To take advantage and to make effective use of global knowledge requires developing domestic absorption capability. China and India have been increasing the number of students in tertiary education. China has the largest number of students at the tertiary level in the world – roughly 31 million compared to 19 million in the United States and 15 million in India. Moreover, 40% of the students in China are in math science and engineering (UNESCO, 2012).

The BRIICS have also been investing in R&D. Whereas OECD countries on average invested 2.4% of their GDP in R&D in 2011, China invested 1.8% of its GDP, Brazil 1.2% (in 2010), the Russian Federation 1.1%, South Africa 0.9% (in 2008), India 0.8% (in 2009) and Indonesia 0.1% (in 2009). Most developing economies invested significantly less than 1% (OECD, 2013f). Although they still lag behind OECD countries in relative spending, China and, to a lesser extent, other emerging economies have made great progress in the last

Figure 2.10. **China has the most significantly imported capital goods during the last decade**

Imports of capital goods as share of GDP in the BRIICS, 1990-2012



Source: Authors' calculations based on UN Comtrade (2013), *United Nations Commodity Trade Statistics* (database), *http://comtrade.un.org/db/default.aspx.*

StatLink http://dx.doi.org/10.1787/888933057799

decades: China was the second largest spender on R&D in the world in 2011, and the Russian Federation, Brazil and India have each spent about as much as Italy or Spain (Figure 2.11).

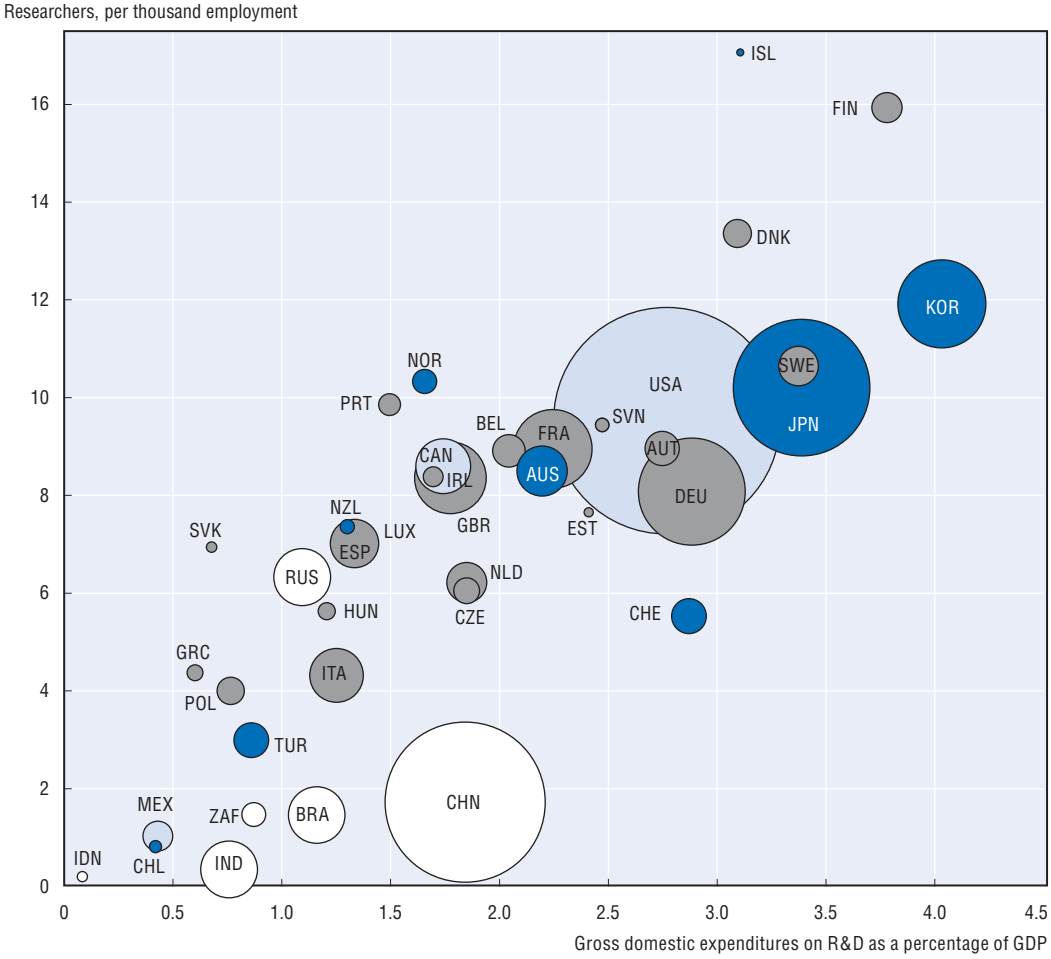
However, the outputs of this R&D effort are not yet commensurate with the inputs. There is still room for progress in most emerging countries, even among those which have upgraded their capabilities. China still ranks 25, South Africa 58, the Russian Federation 62, Brazil 64 and India 66 out of 142 economies in the World Intellectual Property Organization's Global innovation index, while Indonesia is only 85th (Table 2.3).

Two measures of the output side are scientific and technical journals and patents. Scientific and technical journals can be taken as a proxy for the generation of knowledge. Patents generally can be taken as a proxy for knowledge that has some commercial value. China has increased its output of scientific and technical journals by a factor of four between 2000 and 2009 and is now the second largest producer in the world. China and the other BRIICS have also strengthened their intellectual property rights and have increased patenting by residents. In 2012, the Chinese Patent Office registered the largest number of patents in the world. The number filed by Chinese residents was also the highest in the world – 560 681 compared to 486 070 by residents in Japan, and 460 276 by residents in the United States (WIPO, 2013).

The increase in the innovation output of the other BRIICS is much lower. Because domestic systems for intellectual property protection vary widely among countries, it is useful to make some adjustments for quality. A rough proxy for patents is those that have patented in the three main markets of the world: the US Patent and Trademark Office, the European Patent Office and the Japanese Patent Office. The number of these patents is significantly lower (see Table 2.2).

Figure 2.11. **Most BRIICS are investing significantly in research and development (R&D)**

R&D as percentage of GDP versus researchers in R&D per 1 000 employees, in OECD and selected non-OECD countries, 2011



Note: The bubble size indicates total spending on R&D. Owing to methodological differences, data for these countries may not be fully comparable with those for other countries.

Source: OECD (2013g), *Main Science and Technology Indicators* (database), *www.oecd.org/sti/msti.htm;* Brazil's Ministry of Science, Technology and Innovation and UNESCO Institute for Statistics (2013), *www.unesco.org/Pages/default.aspx.*

StatLink http://dx.doi.org/10.1787/888933057818

There are a number of challenges regarding the efficiency of innovation environments, which are country-specific. These challenges often concern, among others, the weakness of linkages between innovation and the markets, the lack of participation of the productive sector in R&D activities, as well as the lack of capacity of the public research. For instance, in China, although productive sector involvement in innovation is significant (around 71% of R&D investment was financed by the productive sector in 2009, but to a large extent by SOEs), some framework conditions for innovation could be more conducive to market-led innovation. This concerns, for instance, the enforcement of intellectual property rights (IPR), corporate governance issues, as well as the framework of public financing of R&D and technology-based entrepreneurship (OECD, 2008). In the Russian Federation, although there are high educational capabilities and strong positions in certain S&T fields, there are also low levels of R&D and innovation activities in private firms, due to weak framework conditions for innovation

Table 2.3. **Innovation indexes partially reflect recent production upgrades**

Rankings out of 142 economies, selected countries in the WIPO Innovation Indexes

	Global Innovation Index	Innovation Output Sub-Index	Innovation Input Sub-Index
Korea	18	24	16
Malaysia	32	30	32
China	35	25	46
Costa Rica	39	31	66
Chile	46	48	41
Poland	49	64	39
Uruguay	52	46	64
Argentina	56	43	78
Thailand	57	61	57
South Africa	58	71	51
Colombia	60	65	59
Russian Federation	62	72	52
Mexico	63	60	68
Brazil	64	68	67
Bosnia and Herzegovina	65	78	58
India	66	42	87
Turkey	68	53	81
Peru	69	70	70
Tunisia	70	59	80
Viet Nam	76	54	89
Kazakhstan	84	106	69
Indonesia	85	62	115
Morocco	92	99	90
Albania	93	118	77
Algeria	138	141	112

Note: The Global Innovation Index is a compilation of existing indicators. It includes two sub-components: the Innovation Input Sub-Index and the Innovation Output Sub-Index. The Innovation Input Sub-Index includes aspects of institutions, human capital and research, infrastructure, market sophistication, and business sophistication. The Innovation Output Sub-Index includes aspects of "knowledge and technology outputs" as well as aspects of "creative outputs".
Source: Cornell University, INSEAD, and WIPO (2013), *The Global Innovation Index 2013: The Local Dynamics of Innovation*, Geneva, Ithaca, and Fontainebleau, *www.globalinnovationindex.org/content.aspx?page=gii-full-report-2013*.

(particularly a lack of competition, not sufficiently strong regulations). Productive-sector (and in particular private-sector) involvement in innovation is low in many emerging and developing countries. It generally finances less than 50% of total R&D investment, compared with more than 60% of total R&D spending in OECD countries. Specifically, firms are not the central players they should be, and this distorts the balance in the public sector's contribution to Russian innovation performance (OECD, 2011c). In other countries, challenges may be also linked to the limited human resource availability. In South Africa, in addition to a greater involvement of private firms in innovation activities, studies point to the need, among other recommendations, to improve the funding of university research (OECD, 2007).

Developing countries also need to develop R&D capability to be able to take advantage of new opportunities in agriculture, manufacturing, services and the environment that are being made possible by continuing advances in biotechnology, new materials, information technology, and environmental sciences including alternative energy (see OECD [2012] for some of the exciting new developments in these areas). Domestic capacity is important to follow these developments and to use them to find better ways to address needs.

Beyond innovation in the strict sense, the dissemination of existing technology and innovation and their adaptation to the local needs should be fostered. Comin and Mestieri (2013) find that 70% of the variation of per capita income across countries can be explained by how quickly they adopt foreign technology and by how fast it diffused internally, with the speed of the later accounting for more of the difference. Thus efforts diffusing technology internally need to be fostered. In addition, many emerging and developing economies boast "islands of excellence" – innovative, world-leading businesses, sectors, regions, and research institutions or universities. They coexist with large groups of unproductive firms, and not only in the informal sector. Consequently, productivity gaps across firms, even within narrowly defined activities, are much larger than in developed countries. Competition certainly plays a role but will not alone resolve challenges, as substantial informal sectors and high levels of underemployment bear out. Difficulties associated with access to skills, information, and finance explain as much as more structural factors, such as the limited capacity of lagging segments of the economy to connect to high-growth sectors and/or firms. Facilitating dissemination of technology and innovation can help increase overall performance, improve equal opportunity, and stimulate growth (Paunov, 2013).

Emerging economies should also focus on inclusive innovation – innovation that addresses the needs of the poor and seeks to deliver good-quality goods and services at a low cost with the purpose of including the excluded in the sharing of benefits. All developing countries, even middle-income ones, have plenty of room for leveraging existing global technologies and improving the welfare of their low-income citizens.

Inclusive innovation can be promoted by harnessing the creativity of formal firms to better meeting the needs of the economically weaker sections of society. Increases in GDP per capita and the production of cheap goods – driven by the entry into the global labour market of more than 2 billion workers with basic skills since the 1990s – have brought dramatic improvements in living conditions. However, it is important to continue reducing the costs and increasing the availability of goods and services needed by the poor. Governments should seek to put in place incentives to encourage formal firms to develop and commercialise pro-poor early-stage technology. Incentives could take the form of preferential matching grants for joint projects bringing together public R&D entities, industries, and universities (Dahlman and Utz, 2005; Paunov, 2013).

Inclusive innovation may also be fostered by better promoting and diffusing entrepreneurial innovation through, for instance, formal evaluation and support of grassroots innovation networks. Such an approach may well create sustainable livelihood and productive income-generating opportunities for the poor, giving them access to a broader range of goods and services while improving entrepreneurship and productivity. In India, grassroots innovation networks support efforts where traditional knowledge and innovative products emerge at the individual and collective level. The programmes include a broad range of actors – governments, NGOs, and the private sector – involved in a host of activities. Although there has been much activity to encourage grassroots innovation, there has not been much assessment or quantification of how it has contributed to improving the livelihoods of people in the informal sector (ibid.).

Grassroots innovations face challenges: the high transaction costs of scouting and documentation, the value-addition imperative, commercialisation, access to finance, and muddled intellectual property rights (IPR). High transaction costs are inevitable in programmes that support a large number of widely scattered informal innovators who

have accumulated knowledge from years of trial and error or who have innovated incrementally from existing tools or agricultural practices. What is needed is good monitoring and evaluation to support grassroots innovations considered contributing positively to a new pilot-inclusive innovation fund.

A further approach to championing inclusive innovation is to help informal enterprises better absorb existing knowledge. Government programmes should promote more effective knowledge absorption in the productive sector and extend the reach of markets to the poor. Support networks can help low-income workers raise productivity and incomes by teaching more efficient production methods. Informal enterprise, formal micro-enterprise, and SME production chains of goods and services suffer from low-quality inputs, stock seasonality and accumulation, weak capital machinery, the unavailability of prototyping and facilities for experimentation, lack of information on and exchange with markets – including for export – and poor understanding of how to manufacture goods (Banerjee, 2006).

Offering equal opportunities and stabilising the middle class

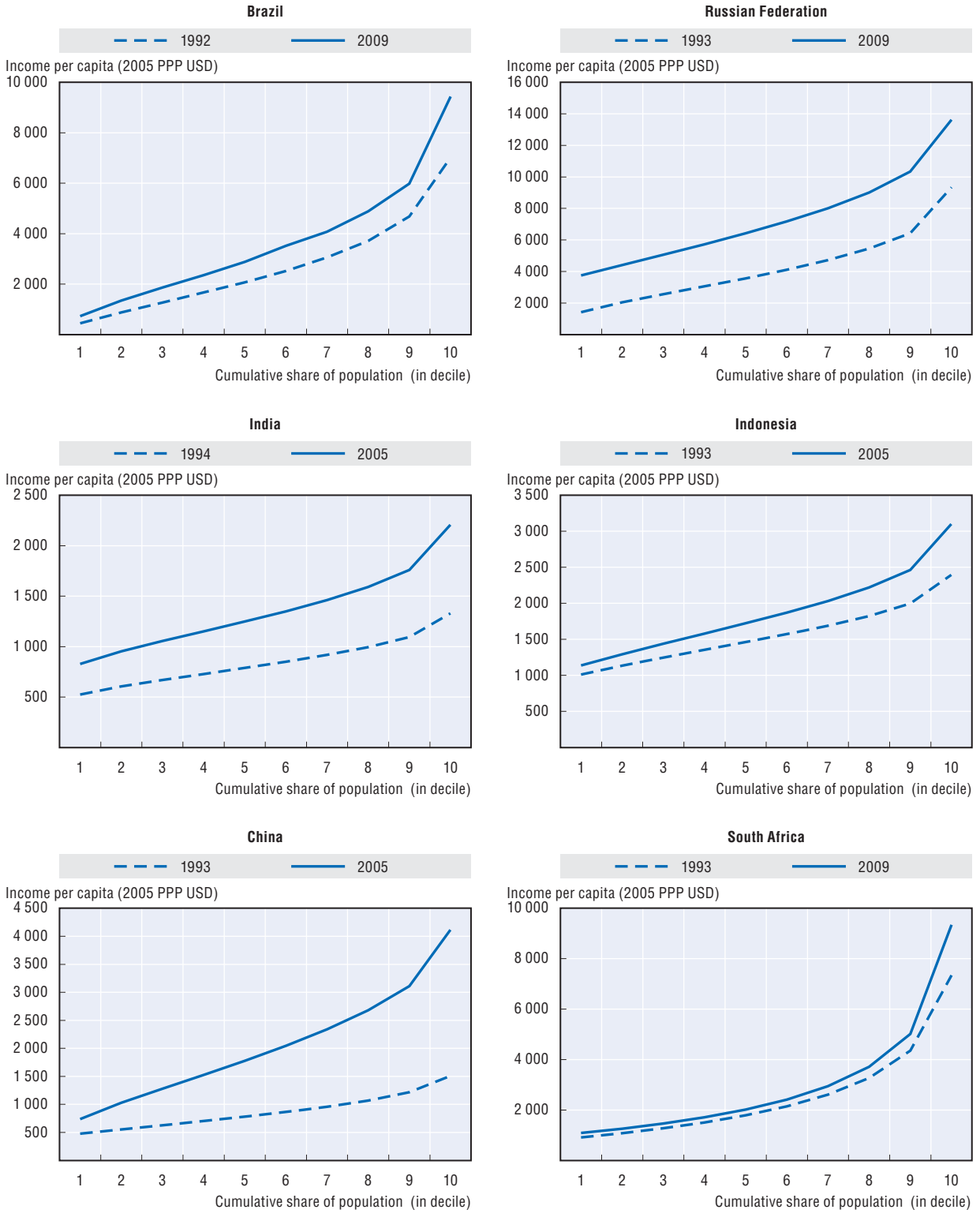
Many emerging and developing economies have been capable of reducing poverty over the last two decades or so; but at the same time inequality of per capita income is increasing in many of these economies. Among the BRIICS for example, the lowest decile of the population (in terms of per capita income corrected for PPP) in China and India was earning the least among all BRIICS economies in the mid-1990s, but this income group could significantly increase its income level during the following decade (Figure 2.12). However, both China and India have experienced a period of increasing inequalities; that is, income groups in the upper brackets could increase their incomes proportionately more than those in the lower brackets. The other BRIICS were also able to expand per capita income in the different income groups and inequalities increased during similar time spans. Brazil and the Russian Federation are exceptions, where the Gini coefficient of income inequality actually decreased.

Inclusiveness, equal opportunities, and the stabilisation of the middle classes also condition economic modernisation and sustainable improvements in productivity. The shifting wealth process has helped spawn the middle classes, but there are rising tensions in a number of emerging and middle-income economies that may hamper growth and lead to instability. The structural transformation of economies brought about by integration into the world economy and the shifting wealth process yields possibilities for fostering the social contract and strengthening the potential for a long-term, sustainable growth path. Nevertheless, strengthening social cohesion and stabilising the middle classes require a long-term vision and commitment. While some policy interventions or reforms can generate results relatively quickly, others do not bear fruit for some time (OECD, 2011b).

Disgruntled middle classes jeopardise convergence

The full participation of the middle classes in development is crucial to sustainable economic upgrading: as they rise, they will provide the educated labour supply and the entrepreneurs required for modernisation. They will also be the backbone of domestic consumption and the prime market for new domestic enterprises. When countries reach middle-income status, absolute poverty generally falls, so that policies can focus more on middle classes rather than on avoiding poverty traps. To that end, they should seek to stabilise the middle classes and foster the social contract.

Figure 2.12. **Inequality is increasing in some of the BRIICS**



Source: Authors' calculations based on Anand, R., S. Mishra, and S.J. Peiris (2013), "Inclusive growth: Measurement and determinants", *IMF Working Paper*, WP/13/135, *www.imf.org/external/pubs/ft/wp/2013/wp13135.pdf*.

StatLink http://dx.doi.org/10.1787/888933057837

Emerging countries' middle classes are fragile in many different ways, as the very concept of middle class is wide-ranging and the associated challenges are in large part country-specific (see Box 2.2). Low standards of education, poor healthcare, and urban congestion are among the biggest risks to the lower strata of the middle classes by way of social and economic exclusion. Generally speaking, however, citizens living in a fast-growing economy have rising expectations for their current and future standards of living as they seek to share in the benefits of growth. As an emerging middle class increasingly compares itself with its peers in advanced economies and middle class individuals compare themselves with each other, patterns of consumption and demands for quality services can be expected to change. Higher incomes, better health, and improved education do not automatically translate into higher life satisfaction, as its decline in fast-growing countries such as Thailand and Tunisia illustrates.

Box 2.2. **Middle-class issues in Brazil, the Russian Federation and South Africa**

Rapid economic growth in non-OECD countries has lifted whole swathes of the population out of extreme poverty in recent decades and led to the creation of "middle classes". They represent a growing opportunity for developing countries through their potential consumption and participation in economic growth. However, the concept of "middle class" covers a wide spectrum of strata, some of which remain fragile. Indeed, Brazil, the Russian Federation, and South Africa have all recently experienced challenges posed by different tiers of the "middle classes".

The lower strata of **Brazil's** rising "middle class" have been the backbone of recent protest movements. Brazil suffers from lack of equal opportunity, a still high level of inequality, and insecure living conditions, particularly for the many people living in large cities. Despite recent falls, Brazil's income-level score on the Gini index remains much higher (at 55 in 2009) than China's (42 in 2009), the Russian Federation's (40 in 2009), or India's (34 in 2010). As an example, around 30% of the Brazilian population have incomes below the world median, whereas the incomes of the wealthiest 5% are higher than those of 75% of the US population (Milanovic, 2012). In addition, public education and healthcare are of a poor standard and where those services are private they are expensive and exclude much of the middle class. Transport infrastructure is inefficient, partly because of the lack of funding due to the crisis in the 1990, and there is generally little upward social mobility in Brazil.

As the economic prospects of the middle class have improved, their expectations of better opportunities and public services have grown. Strikingly, they have not, however, been met. Yet Brazil has higher tax revenues as a percentage of GDP (36%) than other non-OECD countries and similar levels when compared with the OECD average. Brazil must work to make public expenditure and services more efficient and improve citizens' trust in the government.

In **South Africa**, social tensions and criminality are associated with high inequality between the different strata of the population. Violent strikes and high crime rates may not only pose challenge to sustainability and the social contract, they also scare investors. Since the 1990s, the government has used "affirmative action" policies to empower the previously excluded black population. As a result, the black middle class grew significantly from 1.7 million in 2004 to 4.2 million in 2012 if middle-class households are taken as those with incomes of USD 20 000 per year or more (University of Cape Town, 2013). However, such policies have failed to prevent a striking rise in inequalities, with much of the population denied any opportunity to climb the social ladder. The country's income-level rating on the Gini index mounted dramatically in 2000s, from 58 in 2000 (an already very high rate of inequality) to 63 in 2009, the highest rate of any of the BRICS.

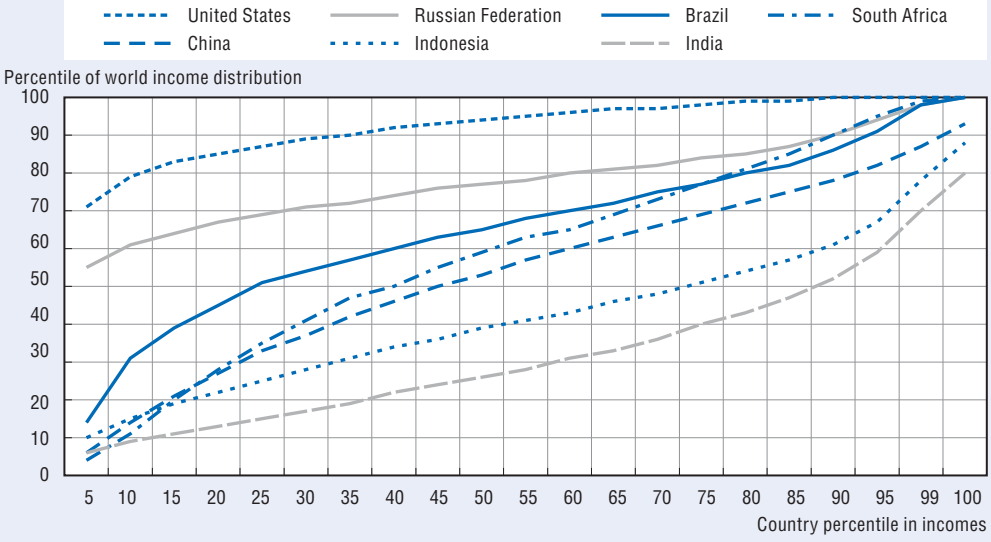
Box 2.2. **Middle-class issues in Brazil, the Russian Federation and South Africa** *(cont.)*

Beyond any affirmative action, it is important to improve equality of chance and reduce inequality. The structure of the South African economy, with private oligopolies and rents tied to natural resources, may hamper equal opportunity by inhibiting competition and entrepreneurship. At the same time, high levels of informality and tax avoidance, as well as largely privatised natural resource revenues, rob the government of the resources it needs to build efficiency in public services and invest in infrastructure.

In the **Russian Federation**, too, there have been recent tensions associated with the rising middle class. The Russian Federation must act to defuse such tensions as they may prompt (foreign) investors to view the Russian Federation as an insecure market and deter them from investing. The situation, however, is different to those that obtain in Brazil and South Africa. The Russian middle class fuelled economic growth through a consumption boom in the 2000s, after the deep economic difficulties of the 1990s. Inequalities, as measured by the Gini index, rose slightly from the beginning of the 2000s. However, the lower strata of the Russian middle class are better-off than in most emerging economies and enjoy better access to free public services.

Unlike Brazil and South Africa, recent tensions occurred partly among the relatively better-off urban-dwelling tiers of the middle class, rather than among its lower strata. The upper middle class is inclined to compare itself with peers in developed countries and is increasingly keen to claim a voice in decision-making processes. To ease tension and take advantage of the middle class's economic potential, the government must act to make its decision-making more transparent and fighting corruption more efficiently.

How the BRIICS countries stand in the world income distribution relative to the United States



Source: Milanovic, B. (2012), "Global income inequality by the numbers: In history and now – an overview", *Policy Research Working Paper Series*, 6259, World Bank.

StatLink http://dx.doi.org/10.1787/888933057856

Growing social challenges are associated with rising income inequalities and the need to meet the rising expectations of citizens as to standards of living, access to opportunity, and voice in the decision-making process (OECD, 2011b). Deep, fast economic transformation often worsens inequalities, social exclusion, and tensions, so raising a number of concerns, particularly for stability. It is risky for governments to disregard the expectations of their emerging middle classes or to underestimate their capacity to mobilise and exert pressure. In this context, strengthening social cohesion becomes a critical policy objective. Furthermore, the revenues of the emerging middle classes are often irregular and social protection systems may pass many people by, either because such systems are not yet sufficiently developed or because many workers remain in the informal sector. As a result, there is a high risk of significant downward social mobility in the event of sickness, job loss, or retirement. These uncertainties may also affect levels of domestic demand and, by the same token, prospects of growth.

In economies endowed with natural resources and in those with heavily specialised activities, rents can contribute to widening inequalities of income and opportunity if they are concentrated in a few hands and not used to nurture other activities. Beyond incentives to increase productivity and the avoidance of corruption, it is important that governments take action to prevent a handful of private actors from monopolising rents. In this regard, a number of resource-rich countries reap the benefits of their natural resource wealth through nationalisation or taxation.

So far, the loyalty of the middle classes seems to have been bought by continuous improvements in their living standards and levels of consumption fed by the shifting wealth process. However, those upward trends are not sustainable without productivity increases. Consumer debt has risen dramatically in countries such as Brazil and South Africa, while in India and across Africa, consumption already accounts for a high proportion of GDP.

Efficient public services and equal opportunities can help ensure the sustainability of competitiveness

Efficient public services and equal opportunities may help unleash the economic potential of the "middle classes" and encourage their involvement in countries' development as they invest in higher education, start-up businesses, and increase their consumption.

One set of challenges common to many emerging economies is the inclusiveness of education systems (OECD, 2013c). In addition to comparatively weak performance, equity in education opportunities (as measured by the survey) is below the OECD-average in countries including Brazil, Colombia, Uruguay or Costa Rica. It should be noted that there is conversely an above OECD-average equity in education opportunities (as measured by the survey) in Hong Kong, China; Macao, China; the Russian Federation; Indonesia; Malaysia or Thailand. In more integrated economies an educational model that enables upward social mobility is imperative: it should afford opportunities for quality schooling across the population to ensure that upward mobility. Greater educational attainment is a way for converging countries to reduce inequality in market incomes in the long run. Beyond enrolment, the standard of education needs to receive attention so that increases in educational outcomes effectively translate into greater productivity, better growth prospects, and improved chances in the labour market.

Globally, profound inequalities of opportunity persist. They are particular marked in Latin America (Daude, 2011) which has not only the world's highest levels of income inequality, but the most unequal prospects of climbing the social ladder. There is a relatively low level of public investment in human capital, as well as a lack of access to proper financing for poor and middle-income families. As a result, Latin American households in the middle of the income distribution have much less access to quality education than their counterparts in OECD countries or their affluent peers in the region. There is a considerable split within the population when it comes to enrolment in schools: the affluent go to private schools and the poor and "middle classes" are concentrated in the public system where resources are few and standards may be low. Inequalities of opportunity in the labour market also point to the "middle classes" and the poor having little incentive to invest in education. Latin American governments must build equity considerations into their design from the outset, if they are to be effective in increasing upward social mobility, education, and labour market policies.

As for social protection, emerging countries could advance the agenda of income security through social protection rather than job security by offering unemployment insurance and assistance, income support while out of employment and in old age, and a range of public services that should include healthcare (OECD, 2011b). The availability of greater fiscal resources (see the next section) can be used here to develop more comprehensive social security systems and protect wider sections of the population.

Fiscal space increased, but the need for sustainable public finance and efficiency persists

Although tax revenues rose in a number of converging countries in the 2000s, tax revenues relative to GDP are still lower in developing economies than in developed ones. There is thus plenty of room for further reforms that broaden the tax base or increase tax rates (Stijns et al., 2012). Effective reform would enable them to rise to the challenges of broad social inclusion and equal opportunity and offset fluctuating tax revenues in resource-rich countries that depend on volatile commodity prices.

Developing effective public services and social benefits is contingent on the availability of adequate resources and improving the efficiency of public spending: programmes should be affordable and financially sustainable in the long term. To that end, funding must be more efficiently allocated. The idea that governments cannot afford to strengthen social protection needs to be set against the often large, poorly targeted subsidies or payments that benefit the non-poor. Instruments such as fuel and food subsidies can be expensive and distortionary and may even be regressive in the case of fuel subsidies (see Chapter 3). However, governments have trouble removing them. India, for instance, plans to reduce fuel subsidies to allow increases in other social benefits and, at the same time, avoid widening the public deficit. However, it has run into difficulties in assessing the impact of its cut in subsidies and in targeting the households that will gain from the new benefits. Similarly, the Dominican Republic is trying to build a large database of households to target those that will benefit from social allowances more accurately. It, too, is experiencing difficulty.

Low levels of trust – regarding how taxes are raised and revenue spent – often undermine reform that considers taxes in isolation from services delivered and institutional change. The challenges of enforcement and tax legitimacy are deep seated and reinforce informality and tax avoidance. Tax administration reform is a powerful way of increasing fairness, transparency, and tax morale in developing countries and to that

end a number of countries have strengthened the resources and capacity of their large taxpayer offices concentrating on monitoring the largest taxpayers in the country. In order to be more effective, however, reform must be part of a general effort to strengthen the social contract and to improve the efficiency of public services. Measures like setting up semi-autonomous tax collection agencies have a greater impact if combined with policy reform on the expenditure side.

Developing effective governments and implementing critical reforms

Countries need to have determined, target-oriented governments and states with a vision to address their respective challenges to improve competitiveness in the increasingly demanding global economic environment. For that purpose, an effective and efficient government administration is needed that translates the overall targets into sectoral and line ministry targets and establishes frameworks to implement the strategies linked to the long-term vision. Moreover, governments need to have the right incentives to implement reforms.

Capacity within the public sector is required

If countries are to overcome the challenges that they face at middle-income level, it is important that they address the administrative and capacity constraints of their governments, particularly those that restrict effective regulation and market efficiency (for the special case of financial regulation, see Prasad, 2011). Increased civil service capacity also generally helps to improve the rule of law and make sound, balanced decisions through clearer understanding of the issues linked to private sector development and globalisation. Smoothly functioning, stable institutions may also exert a direct positive impact on economic diversification (Cadot et al., 2011).[9] For instance, effective contract enforcement strengthens confidence and increases investment in new activities.

Emerging countries are increasingly focusing on capacity building within their civil services. They have, for example, been introducing performance-based assessments of public servants, particularly of senior officials who may be held partly accountable for the outcomes of their administrations (Ketelaar et al., 2007). Action to make public service more efficient targets areas like appointment and promotion, retaining competent staff, and managerial approaches to motivating civil servants. For instance, Brazil's federal government launched a Pluriannual Planning Programme (PPA) in 1999 which divided all government objectives into almost 400 programmes. Programme managers' names are now made publicly available and they are held accountable for results. To improve salaries and reward staff, the PPA also introduced performance agreements spelling out objectives for evaluating individual senior civil servants and increased the budget allotted to the public sector. However, these reforms may take time to provide measurable improvements in the efficiency of the administration, and may have a greater impact if undertaken in co-ordination with an overall focus on improvement of public expenditures. The Russian Federation recently implemented a number of reforms to raise civil servant performance levels across all tiers of government. South Africa introduced working agreements in 2000 that set out objectives for senior civil servants; a problem has been how to identify the most relevant criteria against which to evaluate them – particularly how to account for multiple targets and formulate or assess whether qualitative goals have been met.

Determination, vision and effective administration are essential to support high growth

To switch to a different pattern of growth, a determined and target-oriented government is needed to carry out the bold changes needed to establish the necessary conditions. First, the government needs to have a long-term vision and needs to have the capacity to direct the country towards the long-term goals that quantify the vision (Ohno, 2010, 2009a and 2009b). Several economies that have been successful in avoiding the middle-income trap, such as Korea, Singapore, Chinese Taipei, Finland and Ireland have developed such visions or long-term plans with specific targets (Growth Commission, 2008; Yusuf and Nabeshima, 2012).

Incentives prioritising short-term gains at the expense of long-term goals should be avoided. While this issue may not arise in autarchies, in countries with volatile electoral cycles governments can become overly focused on the near term. To reduce the costs – both opportunity and material – of an over-focus on the near-term, governments need to be held accountable in their direction of the country towards its long-term targets, which typically have a time-frame beyond the term of the government.

In addition to a strong and target-oriented central government, an effective and efficient government administration is needed that translates the overall targets into sectoral and line ministry targets and establishes frameworks to implement the strategies linked to the long-term vision (Delvin and Moguillansky, 2011). Working backwards from overall targets towards specific plans is key in building government capabilities and has been the building block in several East and Southeast economies that have joined the league of advanced countries in the past decades. Most of the successful economies had not only a strong and target-oriented government, but the policies that were linked to the targets were co-ordinated by a strong ministry or agency.

Present attempts to achieve such a co-ordinated development differ in terms of the types, powers and location of co-ordination authority within the government. In some cases, these roles are fulfilled by planning ministries, for instance the National Development and Reform Commission (NDRC) in China, whose departments cover the whole economy and which can effectively co-ordinate line ministries due to the authority given to it by the government. In other economies, due to more limited powers, the planning agency often has less capacity to achieve effective co-ordination. Indonesia's BAPPENAS and Mongolia's National Development and Innovation Commission (NDIC) mainly focus on developing plans and it is up to the charisma of their leaders to persuade other ministries to act jointly for the common good.

Special mandates, such as responsibility for the capital budget sometimes gives planning bodies extra powers. China's NDRC is in charge of formulating and executing the capital budget. To ensure that the capital and current budget are consistent (so that, for instance, it does not happen that construction of a school is approved but not the current spending needed for it to function), effective co-ordination between those planning bodies and the ministries of finance is essential. This co-ordination may take the form of joint committees to approve budgets related to specific projects.

Whether through a top-down approach or through persuasion and co-ordination, such planning bodies can play a crucial role in setting and implementing national targets. The feasibility of a top-down approach also depends on where the country is in the process of democratisation, for instance whether the particular changes required for overarching reforms need to be passed by parliament and the degree of consensus on such reforms in the parliaments. The institutional capacities of the key planning and decision bodies may

also affect their ability to formulate and implement reforms, particularly if the needed reforms go beyond incremental changes, as would be required in situations where the middle-income trap is a real threat.

Support should be consolidated to make bold steps forwards

Sustaining catching up beyond the middle-income level is likely at some point to require some bolder reforms that go beyond incremental and politically more acceptable measures. This will require effective organisations and procedures to implement the necessary steps but their success will depend critically on achieving social consensus behind the reforms. Broad-based support by the multiple stakeholders is key to ensure that the reforms are implemented. Such support can be obtained through consultation processes where all stakeholders – including private businesses, local communities and civil society – can voice their opinion and help in formulating strategies. Consultation, however, should not mean allowing individual stakeholders to veto government proposals. A "concertationist" approach is unlikely to succeed unless the government can reward co-operation or sanction non-cooperation by the social partners or can make a credible threat to proceed unilaterally should concertation fail (Tompson, 2009). Instead, government leadership in terms of firmness of purpose or readiness to act unilaterally or to sanction non-cooperation by stakeholders can be a key ingredient of successful transformations.

Bold changes in strategies may be difficult and costly, though less so than no change. Political costs may also loom large, which may bias governments towards no action, even if the costs of no action are known within the government to be high. To obtain support, therefore, effective communication of the foregone opportunities should the status quo be preserved as well as the cost of no change is needed. Effective communication presupposes trust in the government, which in turn is related to past performance of governments in living up to pre-election and other promises; or on the credibility of in-coming governments that have no or limited past record of governing. A successful example is the 2003 pension reform in France, where the government communicated effectively the costs of maintaining the system which was unsustainable and notwithstanding opposition by public worker unions; it made the pension system more equitable and financially sustainable while strengthening incentives to increase working lives. The messages can be more effective if they are echoed by other stakeholders and by independent experts. In particular, authoritative, non-partisan institutions that command trust across the political spectrum can help formulate public opinion by communicating the necessary measures for reinvigorating economic dynamics and raising prosperity. Fiscal councils that monitor and evaluate government plans and actions, including in budgetary and feasibility terms, have proved an important source of information and transparency in many OECD countries. In some countries, such as the Netherlands, fiscal councils also evaluate election programmes, thereby providing a more objective picture for the electorate.

A government united around required changes can be better positioned not only to communicate but also to implement the required bold reforms more effectively. While a united stance on the policy direction is crucial, it can be achieved in coalition governments and not only in governments dominated by a single party. Moreover, the urgency to act or the types of reforms the government envisages may also affect the success of politically diverse governments in pursuing major reforms. In the case of fiscal consolidation, for instance, the stronger the government's political standing is (with a single-party majority government being the strongest), the less likely it appears to be to implement a thorough

overhaul programme and the more likely it is to adopt smaller, less intensive steps. In fiscal consolidations, the position of the government in the political spectrum also appears to affect its success: centrist governments as opposed to left- or right-leaning ones are more likely to succeed in their reform attempts. The importance of political standing in initiating and successfully carrying out bold measures also depends on the policy domain. In the case of product-market reforms aiming at eliminating producers' rents, for instance, there is less of a division across the political spectrum as the conflicts of interest involved do not usually break down along party-political lines.

Ideally, the electorate would mandate the government to implement the required bold steps to keep the economy on its catching up trajectory. However, the experience of some successful catching up economies suggests that a strong government can get its agenda through even without a mandate or even without an electorate, as in the case of China. In the case of elected governments, however, an electoral mandate may be needed as reform "surprises" may not pay off if there are no visible benefits in the very short run, which is mostly the case with bold reforms aimed at changing catching up paths. The importance of electoral mandates may vary across policy domains to a larger extent depending on their apparent impact on households. If the bold reform measures envisaged include pension or labour-market reforms, there is likely to be greater need for an electoral mandate, compared with, for instance, product-market reforms, which may have a sectoral focus or may be technically complex for the electorate to get interested in or involved with.

The right circumstances are needed for bold reforms

As is the case with painful reforms in general, the timing of the reforms to sustain the catching up process should relate to the electoral cycle, with the first two years of the government's term of office being most effective for passing such reforms (Molnár, 2012). Governments that carry out reforms early in the cycle show their readiness to bear their political costs and may thereby appear to the electorate to be more responsible. In contrast, when elections are approaching, governments may be perceived to want to transfer the costs of reforms to the incoming government, especially if the chances of a change in government are large. In addition, the parliamentarians may become more risk averse as elections approach and there may be less unity within the government, particularly if it is a coalition. The circumstances under which the bold reform measures are proposed and considered also appear to have a bearing on their acceptance by the citizens and ultimately on their success (Tompson, 2009). Therefore, in addition to the electoral cycle, additional factors need to be considered when deciding on the timing of bold reforms. Sound public finances, for instance, are crucial in facilitating the formulation of new strategies. A weak fiscal position makes it harder to compensate potential losers from structural reforms or to provide transition arrangements for them. Conversely, where framework conditions are not propitious, the groundwork may need to be laid before embarking on bold reforms. The external environment may also precipitate reforms, in particular of product markets. Trade liberalisation, enhanced international competition and stepped-up research and innovation activities elsewhere seem to prompt policy makers to adopt new ways of doing things (Tompson, 2009).

Recognising and exploiting opportunities for reform momentum are crucial to implementing overarching changes in economic systems. Public and political receptivity to reform can be generated by expectations related to a change of political systems, the stepping down of long-serving governments or parties or broad-scale market opening, even if triggered by external pressure such as globalisation. A prerequisite is, however, a widely

shared perception that the policies and institutions in place are failing. Conversely, a major reform overhaul is more difficult when existing arrangements are well institutionalised and where there appears to be no imminent danger of breakdown if the status quo is preserved. Viet Nam is a case in point: institutional arrangements, including incentives systems constrain the scope for substantial changes that could prevent the country from falling into the middle-income trap (Ohno 2010, 2009a and 2009b). China's bold reform package announced by the new government seems to face little resistance not only because the government is strong and determined, but because of the widespread recognition that the current big-government market economy may not guarantee sufficient convergence to avoid the middle-income trap, in particular in the face of a rapidly ageing population.

To concentrate scarce government resources and enhance the effectiveness of the policy interventions under bold reforms, targeting and prioritisation of the necessary steps to ensure sustained convergence are needed. Instead of the across-the-board liberalisation advocated by the Washington Consensus until early in this century, governments should focus first on areas where the impacts can be the biggest. Identifying such areas may not always be easy and may depend on country-specific circumstances. Bundling reform packages that relate to similar areas may help to realise synergies by taking into account complementarities and trade-offs. As for sequencing, tackling the easiest issues first may generate a momentum for reform that can trigger further reforms. Initial steps may induce changes in stakeholders' expectations and create new constituencies. A new balance between interest groups may help to reveal privileges and rents that are yet untouched and hence may be easier to address in subsequent measures. In product markets, for instance, opening up some sectors to competition may induce pressures for opening other sectors that supply inputs or services to them (Tompson, 2009).

Key considerations to boost competitiveness in a catching-up context

Developing countries have generally benefitted from globalisation and the rise of China in recent decades, particularly through increased trade opportunities and specialisation built on existing comparative advantages. When productivity has caught up with more advanced country levels, it has often been concentrated in a few numbers of sectors that are the engines of growth in their economies. Labour utilisation also improved after the crises and instability of the 1990s in some countries and accounted for much of the subsequent catch-up growth in income levels, even though labour productivity stalled. The following aspects can be considered to boost competitiveness in a catching-up context:

- There is room for low-income and lower-middle-income economies to continue benefitting from current globalisation patterns, despite fears of slowing growth in such powerhouse economies as China. Developing economies still show wide income gaps with developed countries – which allows room for convergence – and the rise of their middle classes could well bring further opportunities for growth. They should seek to integrate into global value chains, using their existing comparative advantages as initial drivers of growth.
- However, the specialisation in a few sectors in many developing countries is often associated with labour absorption problems, rent seeking, and inefficiencies. Some countries are also specialised in sectors of relatively low complexity compared to their level of development, which threatens the sustainability of growth. Developing economies should foster diversification into activities with higher value added so that they can stay globally competitive even though wages levels are relatively higher at middle-income than lower-income levels. Moreover, diversification makes countries less vulnerable to shocks.

Key considerations to boost competitiveness in a catching-up context *(cont.)*

- There are a number of preconditions for successfully fostering the diversification processes. They include stronger institutions and public governance. Countries should also take measures to improve the efficiency of their product, labour, and financial markets. Increased competition and market mechanisms may be efficient tools for boosting productivity, an approach that is more appropriate to middle-income status, when growth based on factor accumulation comes to an end and the economy has to move towards greater efficiency. The right incentives to invest in new sectors and increase productivity should also be in place. The state can, for instance, take long-term risks where private actors are reluctant. Or it can use purpose-designed regulations when market forces fail to attract the investment needed to fuel catch-up growth. Also in place, therefore, should be governance mechanisms to prevent regulatory capture by stakeholders while, at the same time, including interest groups in the decision-making process.
- Closer coherence between education policies and technology absorption mechanisms would help ensure the provision of skills required for economic modernisation and the diffusion of technology. Whereas educational attainment has steadily improved, quality of education still lags behind in many developing economies and the lack of opportunity reduces incentives to acquire skills. There needs to be wider access to quality education, while education syllabuses and training should match the needs of the economy through appropriately targeted public funding in higher and vocational education. Generally, education systems should, on one hand, be flexible enough to adapt to the needs of the economy and, on the other, properly co-ordinated so as to avoid mismatches and wastes of financial and human resources. Lifelong training, which can help make skills adaptable, should receive government support.
- To improve productivity greater effort needs to be put into innovation. Countries can improve productivity by tapping technologies, management and organisational systems, and business models that have already been developed elsewhere, through FDI, imports of capital goods and components, technology licensing, foreign education and training, foreign consultants, etc. They need to invest in greater domestic capability, including R&D, to make use of and adapt this knowledge, but also to develop better ways of producing goods and services for their needs, and to gain a competitive edge. They also need to develop capabilities to successfully exploit technologies in areas such new materials, biotechnology, and environmental sustainability. In addition, governments should also encourage inclusive innovation to widen the diffusion of technology across society.
- In a context of growing inequality often associated with catch-up growth and urbanisation, policies to ensure equal opportunity and to stabilise the rising "middle classes" would encourage them to take full part in the development of their country. A fully participative "middle class" would be the backbone of the educated labour supply, boost the consumption of domestic products, and drive entrepreneurship. In addition, policies to foster social cohesion would ease the rising tensions kindled by the "middle classes'" thwarted expectations in a number of middle-income economies.
- Finally, countries need to have determined, target-oriented, governments and states with a vision to address their respective challenges. This requires making some bolder reforms that go beyond incremental measures, which in turn demands effective organisations and procedures to implement the necessary steps. Their success will also depend critically on achieving social consensus behind the reforms and careful timing.

Notes

1. The Dutch disease is when, on the one hand, profitability in the resource sector driven by high prices attracts labour and investment from the manufacturing sector and makes sectors linked to natural resources more attractive. The services, too, become more attractive because as incomes rise so does the demand for services. On the other hand, as wages increase across all sectors and demand for the domestic currency rises and causes it to appreciate, manufactured goods become more expensive and less competitive in both home and world markets. Both effects contribute to a de-industrialisation process that makes the economy extremely dependent on the resource sector and may reduce the growth potential.
2. Some countries may already face a slowdown at middle income status, prompted in part by the competition from China, e.g. Latin American countries. (See OECD [2013b] for a discussion of the external and domestic factors that contribute to the slowdown.)
3. In high income economies, this relationship disappears.
4. ILO forecasts are somewhat below Goldman Sachs' 110 million. They project that 80 million people will enter the labour market in India between 2010 and 2020. Both sets of projections are very high, which points to some daunting challenges.
5. The size of the economy is proxied by population. As a measure of diversification, the authors have computed Theil indices at the HS6 level for 1988-2006.
6. This is consistent with WEF (2013) and Aoki (2011).
7. A stronger currency can also be pinpointed as factor behind the lower competitiveness of Brazilian exports. See for instance Canuto et al. (2013).
8. See endnote 5.
9. This is proxied by two variables – the International Country Risk Guide Indicator of Quality of Government and the Revised Combined Polity Score. Both are provided by the Quality of Government Institute.

References

Acemoglu, D., P. Aghion and F. Zilibotti (2006), "Distance to Frontier, Selection, and Economic Growth", *Journal of the European Economic Association*, MIT Press, Vol. 4, No.1, pp. 37-74.

Aghion, P. et al. (2012), *Industrial Policy and Competition*, mimeo.

Aghion, P. et al. (2005), *Exploiting States' Mistakes to Identify the Causal Impact of Higher Education on Growth* mimeo.

Almeida, R. and P. Carneiro (2009), "Enforcement of labor regulation and firm size", *Journal of Comparative Economics*, Elsevier, Vol. 37, No 1), pp. 28-46, March.

Anand, R., S. Mishra, and S.J. Peiris (2013), "Inclusive growth: Measurement and determinants", *IMF Working Paper* WP/13/135, *www.imf.org/external/pubs/ft/wp/2013/wp13135.pdf*.

Aoki, M. (2011), "*The Five Phases of Economic Development and Institutional Evolution in China and Japan*", *ADBI Working Paper Series* No. 340, ADB Institute, Tokyo.

Balassa, B. (1977), "'Revealed' Comparative Advantage Revisited: An Analysis of Relative Export Shares of the Industrial Countries, 1953-71", *The Manchester School of Economic and Social Studies*, Vol. 45, No. 4, pp. 327-344, University of Manchester, Manchester.

Banerjee, P. (2006), "Innovation in Informal, Small and Tiny Industries", background paper commissioned by South Asia Finance and Private Sector Development, World Bank, Washington, DC.

Bas, M. and A. Berthou (2012), "The Unequal Effects of Financial Development on Firms' Growth in India," *Working Papers* 2012-22, CEPII Research Center.

Beck, T., L.F. Klapper and J.C. Mendoza (2008), "The Typology of Partial Credit Guarantee Funds Around the World." *Policy Research Working Paper* No. 4771, World Bank.

Besley, T. and R. Burgess (2004), "Can Labor Regulation Hinder Economic Performance? Evidence from India", *The Quarterly Journal of Economics*, vol. 119(1), pages 91-134, MIT Press, February.

Besley, T.J. and M. Kudamatsu (2007), "Making Autocracy Work", *CEPR Discussion Papers* 6371, C.E.P.R.

Buiter, W.H. and E. Rahbari (2011), "Global Growth Generators; Moving beyond 'Emerging Markets' and 'BRIC'", *Citi Global Economics*, 21 February.

Cadot, O., C. Carrere and V. Strauss-Kahn (2011), "OECD imports : diversification of suppliers and quality search", *Policy Research Working Paper Series* 5627, The World Bank. *www.ilo.org/wcmsp5/groups/public/@ed_emp/documents/genericdocument/wcms_166467.pdf*.

Canuto, O., M. Cavallari and J. Reis (2013), "Brazilian Exports: Climbing Down a Competitiveness Cliff", *World Bank Policy Research Working Paper No. 6302*, Washington, DC, *http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-6302*.

Chamon, M. and M. Kremer (2009), "Economic transformation, population growth and the long-run world income distribution", *Journal of International Economics*, Vol. 79, pp. 20-30, September.

Comin, D. and M. Mestieri (2013), "Technology Diffusion: Measurement, Cause and Consequences", *NBER Working Paper* No.19052 (May).

Cornell University, INSEAD, and WIPO (2013), *The Global Innovation Index 2013: The Local Dynamics of Innovation*, Geneva, Ithaca, and Fontainebleau. Available at: *www.globalinnovationindex.org/content.aspx?page=gii-full-report-2013*.

Dahlman, C. and A. Utz (2005), "India and the Knowledge Economy: Leveraging Strengths and Opportunities", *World Bank Institute Development Studies* No. 32924, World Bank.

Daude C. (2011), "Ascendance by Descendants? On Intergenerational Education Mobility in Latin America", *OECD Development Centre Working Paper* No. 297, OECD Publishing Paris.

Delvin, R. and G. Moguillansky (2011), *Breeding Latinamerican tigers: Operational principles for rehabilitating industrial policies*, UN Economic Commission for Latin America, Santiago Chile.

Felipe, J., A. Arnelyn and U. Kumar (2012), "Tracking the Middle-Income Trap: What is it, Who is in it, and Why?", *Levy Economics Institute Working Paper* No. 715, April. Available at: *www.levyinstitute.org/pubs/wp_715.pdf*

Felipe, J., A., Arnelyn and U. Kumar (2010), "How Rich Countries Became Rich and Why Poor Countries Remain Poor: It's the Economic Structure . . . Duh!", *Economics Working Paper Archive* wp_644, The Levy Economics Institute.

Freeman, R.B. (2009), "Labor Regulations, Unions, and Social Protection in Developing Countries: Market distortions or Efficient Institutions?", *NBER Working Paper No. 14789*, National Bureau of Economic Research, Cambridge MA.

Gelb A., C. Meyer, and V. Ramachandran (2013), "Does Poor Mean Cheap? A Comparative Look at Africa's Industrial Labor Costs", *CGD Working Paper* 325. Washington, DC: Center for Global Development, *www.cgdev.org/publication/does-poor-mean-cheap*.

Gill, I. and H. Kharas (eds.) (2007), *An East Asian Renaissance: Ideas for Economic Growth*, World Bank.

Goldman Sachs (2010), "India's Rising Labour Force", *Global Economics Paper* No. 201.

Growth Commission (2008), *The Growth Report: Strategies for Sustained Growth and Inclusive Development*, World Bank, Washington, DC.

Haltiwanger J., S. Scarpetta and H. Schweiger (2008), "Assessing Job Flows Across Countries: The Role of Industry, Firm Size and Regulations", *NBER Working Papers* No. 13920, National Bureau of Economic Research, Cambridge MA.

Hanson, G.H. (2012), "The Rise of Middle Kingdoms: Emerging Economies in Global Trade", *Journal of Economic Perspectives*, American Economic Association, Vol. 26, No. 2, pp. 41-64.

Harrison, A., and J. Scorse (2010), "Multinationals and Anti-sweatshop Activism", *American Economic Review*, 100(1): 247-73. DOI: 10.1257/aer.100.1.247.

Hausmann, R., J. Hwang and D. Rodrik (2007), "What you Export Matters", *Journal of Economic Growth*, Vol. 12. No. 1, March.

Hausmann, R. and D. Rodrik (2006), "Doomed to choose: Industrial Policy as a Predicament", paper prepared for the first Blue Sky seminar, Boston: Center for International Development, Harvard University, 2 September.

Heckman, J.J. and C. Pagés (2000), "The Cost of Job Security Regulation: Evidence from Latin American Labor Markets", *Research Department Publications 4227*, Inter-American Development Bank, Research Department.

Hidalgo, C., B. Klinger, A. L. Barabasi and R. Hausmann (2007), "The product space conditions the development of nations." *Science* 317: 482-487.

Huang, Y. and T. Jiang (2010), "What Does the Lewis Turning Point Mean for China? A Computable General Equilibrium Analysis", *Working Paper*, No. E2010005, China Center for Economic Research, Beijing, March, *http://en.ccer.edu.cn/download/6827-1.pdf*.

ILO (2013), *Global Employment Trends 2013, Recovering from a second jobs dip*, International Labour Organisation, Geneva.

Imbs, J. and R. Wacziarg (2003), "Stages of Diversification", *American Economic Review*, American Economic Association, Vol. 93, No. 1, pp. 63-86, March.

IMF (2011), *Changing Patterns of Global Trade*, Available at: *www.imf.org/external/np/pp/eng/2011/061511.pdf*.

Jankowska, A., A.J. Nagengast and J.R. Perea (2012), "The Product Space and the Middle Income Trap – Comparing Asian and Latin American Experiences", *OECD Development Centre Working Paper*, No. 311, OECD Publishing, Paris.

Johansson, A. et al., (2012) "Looking to 2060: Long-Term Global Growth Prospects: A Going for Growth Report", *OECD Economic Policy Papers*, No. 3, OECD Publishing, Paris.

Ketelaar, A., N. Manning and E. Turkisch (2007), "Performance-based Arrangements for Senior Civil Servants OECD and other Country Experiences", *OECD Working Papers on Public Governance*, 2007/5, OECD Publishing, doi: *http://dx.doi.org/10.1787/160726630750*.

Kharas, H. (2010), "The emerging middle class in developing countries", *Working Paper No. 285*, OECD Development Centre, OECD, Paris.

Kharas, H. and A. Rogerson (2012), *"Creative Destruction in the Aid Industry"*, Overseas Development Institute, London, *www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/7723.pdf*.

Klinger, B. and D. Lederman (2006), "Diversification, innovation, and imitation inside the Global Technological Frontier", *Policy Research Working Paper Series 3872*, World Bank, Washington, DC.

Koren M. and S. Tenreyro (2013), "Technological Diversification", *American Economic Review*, American Economic Association, Vol. 103, No. 1, pp. 378-414, February.

Krugman, P. (1991), "Increasing Returns and Economic Geography", *Journal of Political Economy*, University of Chicago Press, vol. 99(3), pages 483-99, June.

Kucera, D. and T. Xenogiani (2009), "Persisting Informal Employment: What Explains It?" in Johannes Jütting and Juan De Laiglesia (eds.), *Is Informal Normal? Towards More and Better Jobs in Developing Countries*, OECD Publishing Paris.

McKinsey (2009), McKinsey Global Survey, quoted in: "An Exorbitant Privilege? Implications of Reserve Currencies for Competitiveness", *McKinsey Global Institute Discussion Paper*, December.

Mesquita, M. (2006), "Fear of China: Is There a Future for Manufacturing in Latin America?", IADB. *http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=36383434*.

Milanovic, B. (2012), "Global income inequality by the numbers: in history and now – an overview –", *Policy Research Working Paper Series* 6259, World Bank.

Molnár, M. (2012) "Fiscal consolidation: What factors determine the success of consolidation efforts?", *OECD Journal: Economic Studies Vol. 2012(1)*, OECD, Paris.

Moreno, L. (2011), *La década de América Latina y el Caribe: una oportunidad real*, Inter-American Development Bank, Washington, DC, May.

OECD (2013a), *Perspectives on Global Development 2013: Industrial Policies in a Changing World*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/persp_glob_dev-2013-en*.

OECD (2013b), OECD-WTO Database on Trade in Value-Added (TiVA), *www.oecd.org/industry/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm*.

OECD (2013c), *Economic Policy Reforms 2013: Going for Growth*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/growth-2013-en*.

OECD (2013d), *Education at a Glance 2013: OECD Indicators*, OECD Publishing, Paris, doi: *http://dx.doi.org/10.1787/eag-2013-en*.

OECD (2013e), *OECDstat* (database), *http://stats.oecd.org/Index.aspx?lang=en&SubSessionId=0dbfe8ee-3a8b-48a8-b436-112a63797b98&themetreeid=-200*.

OECD (2013f), *OECD Science, Technology and Industry Scoreboard 2013: Innovation for Growth*, OECD Publishing, Paris, doi: *http://dx.doi.org/10.1787/sti_scoreboard-2013-en*.

OECD (2013g), *Main Science and Technology Indicators* (database), *www.oecd.org/sti/msti.htm*.

OECD (2012), *Science, Technology and Industry Outlook 2012*, OECD Publishing, Paris, doi: *http://dx.doi.org/10.1787/sti_outlook-2012-en*.

OECD (2011a), *Product Market Regulation* (database), *www.oecd.org/economy/pmr*.

OECD (2011b), *Perspectives on Global Development 2012: Social Cohesion in a Shifting World*, OECD, Paris, *http://dx.doi.org/10.1787/persp_glob_dev-2012-en*.

OECD (2011c), *OECD Reviews of Innovation Policy: Russian Federation 2011*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264113138-en*.

OECD (2009), *Innovation and Growth: Chasing a Moving Frontier*, OECD and the World Bank, Paris.

OECD (2008), *OECD Reviews of Innovation Policy: China 2008*, OECD Publishing. *http://dx.doi.org/10.1787/9789264039827-en*.

OECD (2007), *OECD Reviews of Innovation Policy: South Africa 2007*, OECD Publishing. *http://dx.doi.org/10.1787/9789264038240-en*.

OECD/ECLAC (2012), *Latin American Economic Outlook 2013: SME Policies for Structural Change*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/leo-2013-en*.

Ohno, K. (2010), "Avoiding the middle-income trap: Renovating industrial policy formulation in Vietnam", revised paper available at *www.grips.ac.jp/vietnam/KOarchives/doc/EP32_ADB_HQ_MIT.pdf%20*accessed on 20 August 2013.

Ohno, K. (2009a), "Avoiding the middle-income trap: Renovating industrial policy formulation in Vietnam", *ASEAN Economic Bulletin 26-1*.

Ohno, K. (2009b), *The Middle Income Trap – Implications for Industrialisation Strategies in East Asia and Africa*, GRIPS Development Forum.

Paunov, C. (2013), "Innovation and Inclusive Development: A Discussion of the Main Policy Issues", OECD Science, Technology and Industry Working Papers, 2013/01, OECD Publishing. *http://dx.doi.org/10.1787/5k4dd1rvsnjj-en*.

Paus, E. (2009), "The Rise of China: Implications for Latin American Development", *Development Policy Review*, Vol. 27, No. 4), pp 419-456, *http://onlinelibrary.wiley.com/doi/10.1111/j.1467-7679.2009.00454.x/abstract*.

Penn World Tables (2013), *Penn World Tables* (database), *https://pwt.sas.upenn.edu/*.

Prasad, E.S. (2011), "Financial Sector Regulation and Reforms in Emerging Markets: An Overview", *NBER Working Paper* 16428, *www.nber.org/papers/w16428.pdf?new_window=1*.

Stijns, J., et al. (2012), *Can we still Achieve the Millennium Development Goals? From Costs to Policies*, Development Centre Studies, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264173248-en*.

Sturgeon, T. and G. Gereffi (2010), "Measuring Success in the Global Economy: Technological Learning, Industrial Upgrading, and Business Function Outsourcing in Global Value Chains", *Transnational Corporations*, 17:4.

Sturgeon, T. and O. Memedovic (2011), Mapping Global Value Chains: Intermediate Goods Trade and Structural Change in the World Economy, UNIDO, Vienna.

Tompson, W. (2009), *The Political Economy of Reform – Lessons from Pensions, Product Markets and Labour Markets in Ten OECD Countries*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264073111-en*.

Transparency International's Perceived Corruption Index (2012), available at: *www.transparency.org/cpi2012/results*.

UN Comtrade (2013), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx*.

UNCTADStat database (2014), *http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx*.

UNESCO Institute for Statistics (2013), *www.uis.unesco.org/Pages/default.aspx*.

UNESCO (2012), *World Education Digest 2012*, UNESCO, Montreal.

UNIDO (2009), *Industrial Development Report*, United Nations Industrial Development Organisation, Vienna.

UNIDO (2012), *Structural Change, Poverty Reduction and Industrial Policy in the BRICS*, United Nations University, UNIDO, *http://institute.unido.org/documents/M1_Home/BRICS_report.pdf*.

University of Cape Town (2013), *Four Millions and Rising*, Unilever Institute of Strategic Marketing.

WEF (2013), *The Global Competitiveness Report 2013-14*, WEF, Geneva, *www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf*.

Williamson, J. (2000), "Exchange Rate Regimes for Emerging Markets: Reviving the Intermediate Option", *Policy Analyses in International Economics* 60, Peterson Institute for International Economics. Available at: *www.piie.com/publications/chapters_preview/320/iie2938.pdf*.

WIPO (World Intellectual Property Organization) (2013), *World Intellectual Property Indicators 2012*, WIPO, Geneva.

Wölfl A., I. Wanner, O. Röhn and G. Nicoletti, (2010), "*Product Market Regulation: Extending the Analysis Beyond OECD Countries*", *OECD Economics Department Working Papers*, No. 799.

World Bank (2013), *World Development Indicators 2013*, World Bank, Washington, DC, *http://data.worldbank.org/data-catalog/world-development-indicators*.

Yusuf, S. and K. Nabeshima (2012), *Some small countries do it better: Rapid growth and its causes in Singapore, Finland and Ireland*, World Bank, Washington, DC.

ANNEX 2.A1

Methodological notes

The Product Space – diversification versus specialisation

Jankowska et al. (2012) rely on a novel strand of the trade literature known as "The Product Space", developed through contributions from Hausmann et al. (2007), and Hidalgo et al. (2007).

Revealed comparative advantage (RCA) is calculated following Balassa (1977) as the ratio of the export share of product *i* in country *c* to the world's export share of product *i*. A country will therefore be competitive in exporting good *i* if its RCA with respect to product *i* is greater than 1 if, that is, the share of good *i* in a country's export basket is greater than the share of the same good globally.

$$RCA_{ci} = \frac{x_{ci} \Big/ \sum_i x_{ci}}{\sum_c x_{ci} \Big/ \sum_c \sum_i x_{ci}}$$

With regards to the concept of export value, Jankowska et al. (2012) adopt the PRODY variable originally suggested in Hausmann et al. (2007). For each product, the index is composed of a weighted average of the per capita GDP of the countries that export it, with the weights being the RCA associated with that country and good. The PRODY variable represents "the income level associated with that product". A higher PRODY corresponds to goods that are exported by high-income countries. The variable is, therefore, an estimate of the level of sophistication, or value added, embedded in the good. Algebraically, the expression is given by:

$$Prody_i = \sum_c \left[RCA_{ci} \cdot GDP_c \right]$$

x_{ci} = *exports i in country c*

X_c = *Total value of exports for country C*

Jankowska et al. (2012) compute PRODY as an average of the annual values for the years 2000-05. This interval covers the period with the most comprehensive reporting of trade series across countries, covering around 770 different industries out of a possible maximum number of 854.10.

Hausmann et al. (2007) use PRODY to construct a variable called EXPY, which is the weighted average of the PRODY of the goods exported by a country, with the weights being their relative export shares. Accordingly, EXPY is an estimate of the degree of sophistication of a country's export basket and was shown to be a strong predictor of per capita GDP growth (Hausmann et al., 2007). The EXPY can either rise through additional new sectors of high PRODY, or simply by increasing the export share of current high PRODY sectors (i.e. extensive vs. intensive upgrading).

Perspectives on Global Development 2014
Boosting Productivity to Meet the Middle-Income Challenge

Chapter 3

Improving competitiveness in manufacturing industries

This chapter begins with a discussion of the important role of the manufacturing sector and estimates productivity growth rates in several key manufacturing industries in selected middle-income countries. The second section looks at ways to foster a more competitive business environment that could boost manufacturing productivity in middle-income countries. The chapter then moves on to look at targeted policies to improve competitiveness at the firm level. The final section of the chapter addresses energy and carbon efficiency as additional dimensions of competitiveness not always internalised by firms. This chapter uses multiple measures of competitiveness to better describe how firms perform.

Industrialisation is an important driver of growth, but an insufficient guarantee of income convergence by itself. Also imperative is competitive manufacturing through diversification into higher value-added activities and improved products and processes. The failure to address the challenges of competitiveness is ultimately responsible for growth slowdowns, though effects are shaped by broader macroeconomic non-price factors. As growth in emerging economies based on factor accumulation and sectoral reallocation fades, it will be driven primarily instead by industry competitiveness. Having exhausted many of the gains achievable through reallocation, within-industry productivity change by firms is responsible for the bulk of growth in OECD economies.

The dynamics of productivity change are directly affected by industry structure, the business environment, and firm-specific factors. Policies designed to improve competitiveness must therefore foster the development of supportive environments and encourage firms to grow and innovate. Such policies must factor in country- and region-specific contexts and the characteristics of the industries involved. This chapter discusses the need for competitiveness in emerging economies' manufacturing industries and the policy options for governments addressing this challenge.

The first section of this chapter discusses the role of manufacturing in driving income convergence. Productive manufacturing in emerging economies often requires the development of new industries in fields of activity with greater potential for technological and productivity growth. More important, however, is continued broad-based productivity growth across all industries. The second and third sections address how this change can be accomplished through, respectively, a business environment that fosters competition and targeted policies to help improve firm competitiveness.

The final section addresses energy and carbon efficiency as additional dimensions of competitiveness not always internalised by firms. As a result, inefficient energy use may give the appearance of high productivity. Weighing such externalities against conventional measures of competitiveness is a valuable way of offsetting their shortcomings. Accordingly, this chapter uses multiple measures of competitiveness to better describe how firms perform (Box 3.1) drawing on firm-level survey and census data.*

* In addition to industry-level data, the estimations in this chapter are based on estimates from firm-level surveys in Brazil (2005-09), Cameroon (2002-07), China (2002-09), Colombia (2005-07), India (2002-08), the Russian Federation (2003-09), Senegal (1998-2011) and South Africa (2005-08), and census data from Cameroon (2008) and Indonesia (2002-10). Manufacturing industries were included in all datasets and industry classifications were adjusted to ISIC Rev.3 two-digit classifications.

To remove the influence of micro firms and improve the comparability of results across countries, observations from firms with fewer than 20 employees were excluded from the analysis. In total, more than 2 million firms were covered by these datasets.

Box 3.1. **Multiple measures are needed to assess competitiveness**

Industry competitiveness is a multi-faceted concept, best described with multiple measures of the effectiveness of production processes. The analyses in this chapter make use of a range of measures to describe various aspects of competitiveness: labour and total factor productivity, technical efficiency, competitive pressure and energy intensity.

Labour productivity, measured as output or value added per worker or per hours worked, is a convenient indicator of competitiveness because it is simple and a major determinant of income per worker. As it measures output while controlling for only one factor of production, labour productivity cannot be used to separate the effects of the input used from the amount of non-labour inputs used. In fact, capital-labour ratios are an important driver of labour productivity differences across countries.

By measuring the proportion of output not explained by the use of labour, capital, or intermediates, total factor productivity (TFP) controls for the effects on output of differing capital stocks, intermediate goods and labour inputs. TFP subsumes a firm's level of technology, input quality, scale, organisation, and utilisation of capacity. In many cases, TFP is therefore a preferable measure of performance to labour productivity. This chapter includes TFP estimations using firm-level survey and census data from Brazil, Cameroon, China, Colombia, India, Indonesia, Russia, Senegal, and South Africa for various time spans between 1998 and 2011. Firm TFP was calculated as the residual from a country- and industry-specific production function for firms with at least 20 employees, estimated using an OLS model with fixed effects (Annex 3.A1). Summaries of TFP and labour productivity by firm characteristics are presented for the countries for which reliable data were available.

Technical efficiency complements labour productivity and TFP measures. It describes the difference between individual producers and a frontier of firms most efficient at maximising outputs from a given set of inputs. Estimated using data envelopment analysis, technical efficiency scores can be used to make general inferences as to the quality of production factors used and the efficiency of the way they are used. Recognising that firms are interested in increasing their market shares and profits, technical efficiency is defined here as the relative efficiency of firms in maximising these outputs subject to labour, intermediate input, and capital costs. It was calculated by industry, across all nine countries for which data on at least 20 firms were available.

Industry mark-ups were estimated by country over multiple years to measure competitive pressure. Also, high levels of labour productivity and TFP can be the result of increased prices rather than reduced input use for a given level of output. Measured in terms of output value, high productivity at the firm or industry level can be the result of demand effects where firms with market power are able to raise mark-ups. Therefore, estimated markups by country and industry are also used to qualify industry-level TFP results.

Finally, since pollution and carbon emissions produce negative social and environmental effects that are not priced in markets without relevant regulations, energy and carbon intensity are appropriate measures for correcting private productivity gains realised at a social cost. Where energy subsidies for producers are available, measures of energy intensity can also be used to highlight the artificial competitive advantages given to firms that have fewer incentives to limit their energy use. Volatile and increasing energy prices are also a threat to firms' long-term competitiveness.

These five measures are used together in this chapter to provide a fuller description of competitiveness among firms and industries and to balance the shortcomings inherent in each when relied upon exclusively.

Converging through manufacturing

The manufacturing sector plays a critical anchor role in the economic development of countries transitioning from dependence on primary industries. And even among economies that have converged while remaining relatively dependent on the exports of natural resources, growth has typically included the development of related industries around their main primary sectors. In Norway, for example, a period of deindustrialisation when oil and gas reserves were first exploited was reversed by the rise of local suppliers and processors.

Manufacturing typically increases as a share of GDP as per capita incomes rise from low levels, but may then declines as wealthier consumers shift more of their spending to services. Productivity tends to be higher in manufacturing than in agriculture and traditional services like the wholesale and retail trade, since concentrated production encourages capital accumulation and creates economies of scale. Relative to other sectors, higher sustained growth rates in manufacturing are made possible by continuous innovation and widened by stronger linkage and spillover effects. Finally, manufactured goods are easily exported, allowing access to larger markets even for low-income countries which have low domestic demand that increases disproportionately as domestic incomes rise from low levels. Even countries with relatively large shares of GDP in services sectors for their income level – such as South Africa, Brazil, the Russian Federation and India – export more manufactured goods than services. However, as a result of the ICT revolution and the emergence of business services providers, services are ever more storable, tradeable and innovation-intensive, which enables them to contribute increasingly to productivity growth. Chapter 4 discusses the possibilities for services-driven development.

To support continued convergence, the development of manufacturing requires not only the expansion of employment, but movement into higher value-added activities together with product and process improvements in industries and firms across all areas of manufacturing.

Diversifying across manufacturing is important for economic development

Even within the manufacturing sector, diversification into higher-value-added industries can be an important factor in productivity growth. Industrialisation therefore requires the development of a range of manufacturing industries, particularly in countries far from the global technological frontier. Primary sector-based developing countries and late industrialisers specialising in more labour-intensive activities may well need to move into industries with greater potential for technological absorption and productivity growth.

As the relevance of innovation in products and processes is likely to vary by industry, the expansion of innovation-intensive activities can, similarly, create additional opportunities for productivity growth. While the technological development of an industry will vary by place and time, high-tech manufacturing activities tend to include a high share of research and development in their value added and make use of technology that is either disembodied or embodied in capital and intermediate inputs. Country-to-country differences in productivity by industry are also shaped by comparative advantages of production, which are in turn shaped by demographics, environment, governance, infrastructure, education, and a host of other factors. In this respect, governments may introduce strategies to facilitate diversification into more innovation-intensive industries. To that end Korea and Malaysia implemented particularly interventionist policies, although such degrees of government involvement may not always be appropriate (Box 3.2).

Box 3.2. **Active manufacturing strategies helped drive diversification in Korea and Malaysia**

Diversification into higher-value-added manufacturing activities has often been directed by broad strategies designed to exploit and develop areas of comparative advantage. Korea and Malaysia adopted approaches that included a particularly active role for the government in developing new areas of production. Although largely successful thanks to their effective implementation and favourable conditions, these policies may not be easily transplanted elsewhere and are not the only models for diversification.

In **Korea**, the government successfully implemented an export-led development strategy with strong support for domestic industrial conglomerates, the *chaebol*. These businesses served as anchor firms, characterised by their complex business structure with many affiliates and subsidiaries in various sectors that accounted for a large share of domestic production and turnover. Even after restructuring in 2002, the 30 largest *chaebol* still comprised more than 600 individual firms. These conglomerates took advantage of economies of scale and scope at many levels, quick decision-making that facilitated adjustments to the challenges of globalisation, and expansion into new products that was helped by the presence of established brand names.

The emergence of the *chaebol* was supported by the government with policy measures targeted at exporting activities. Exporting industries were granted import licenses to ensure access to raw materials, preferential interest rates, bank loans, and tax benefits. The government also negotiated export targets with the private sector and monitored industrial activities closely to intervene where necessary so as to achieve trade targets. While some of these measures were directed at a broad set of industries, the government gave particular attention to labour-intensive industries in the early years, then later shifted towards more high-technology industries to maintain economic growth.

For example, in the 1970s the government developed the Heavy Chemical Industry (HCI) plan which targeted industries like shipbuilding, electronics, and machinery. The industries were chosen for their potential contribution to growth, macroeconomic effects, and integration in value chains, and subsequently benefitted from many of the above-mentioned preferential policies. The strategy indeed contributed to exceptional growth during the 1970s, but the government was equally prepared to develop new strategies designed to strengthen R&D in the 1980s, once the growth potential of the HCI strategy had been exhausted.

Malaysia's government was also closely involved in developing new domestic industries and encouraging the growth of domestic production networks. The automotive and electronics and electrical product industries in particular benefitted from this support. In addition to the reforms it introduced in the late 1960s to scale back its import substitution strategy, the government undertook diversification by creating leader state-owned enterprises (SOEs), protecting targeted infant industries, and adopting a selective approach to FDI.

The establishment of the state-owned automaker, Proton, in 1983 fostered the development of a large local auto parts industry. Along with high tariffs and non-tariff protections, the industry has continued to grow by supplying foreign automakers and Perodua, a privately-owned Malaysian vehicle manufacturer assembling Toyotas and vehicles under its own brand. However, the electronics and appliance industry, now a major contributor to Malaysia's exports, grew with relatively low levels of protection and, after the collapse of the Malaysia Electric Corporation, with a lead SOE. The government has instead been selective in granting permission for FDI and has encouraged investment

Box 3.2. **Active manufacturing strategies helped drive diversification in Korea and Malaysia** *(cont.)*

in high-tech industries. From 1993, the Ministry of International Trade and Industry's Vendor Development Programme offered foreign firms preferential treatment in return for their pledge to purchase from local suppliers. Diversification continued through backward integration into the higher-value-added aspects of chip-making and other high-tech industries.

While the development of new exporting industries contributed significantly to growth in both countries, Korea's openness to technology transfer and its comprehensive approach to innovation have allowed it to transition more into high-tech industries and grow much quicker than Malaysia since the 1980s. Malaysia's development has been hindered by a less hospitable business environment and less openness to international technology transfers through partnerships with foreign firms, relying more on technological upgrading by domestic producers. Education also played an important role in Korea's development of innovative industries, while there has been a lack of skilled labour in Malaysia. Korea and Malaysia therefore illustrate the potential for growth through the creation of new industries and the need for development strategies that incorporate advanced technologies.

However, the relative successes of these countries in "picking winners" do not necessarily mean that their results can be easily replicated elsewhere. Korea and Malaysia had strong governments with effective bureaucracies. Their strategies were not without missteps. Many Korean *chaebol*, which had relied on government lending and foreign debt, collapsed or were forced to restructure after the 1997 Asian financial crisis exposed their weaknesses. In Malaysia, industrial policy was also used as a tool for race-based redistribution that held back, rather than encouraged, competitiveness. As may be expected, protected industries have had trouble adjusting to international competition: Malaysian automakers, for example, lost considerable market share as the domestic market liberalised.

Diversification strategies pursued in the future will be different not only because country contexts will be, too. They will also be responding to a different global context. Global value chains – which can encourage narrowly-focused specialisation – and competition with Chinese exports may make it challenging for industrialising countries to develop new, internationally competitive industries. Services are also likely to play a more important role in diversification strategies, which have hitherto tended to emphasise industrialisation. Korea's chaebol-centred growth largely neglected the services sector which – apart from some low-productivity traditional services – is also smaller than may be expected in Malaysia for an economy at its income level.

Broad productivity growth in all industries is still needed for sustained improvements in competitiveness

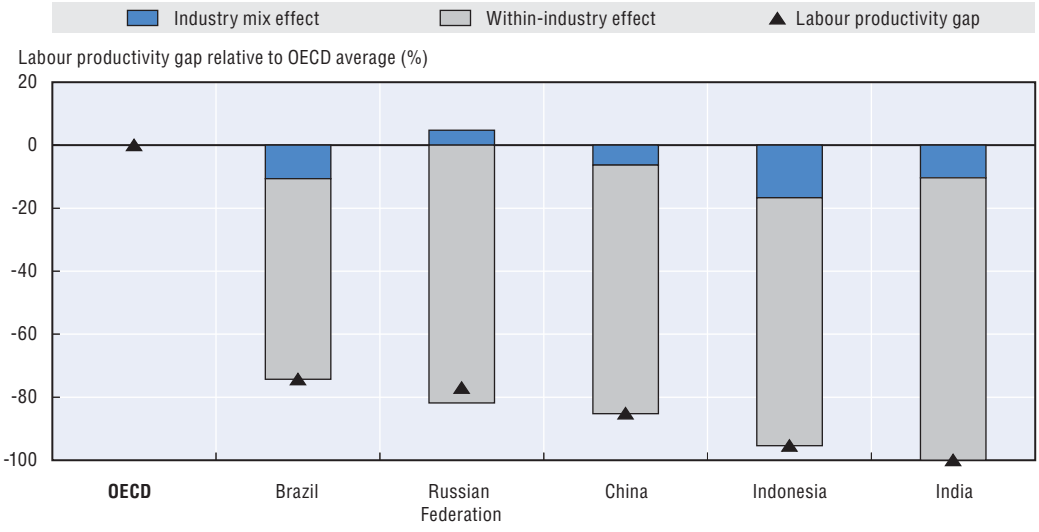
Broad-based improvements in competitiveness across all industries are needed along with diversification in lower-income economies, but become particularly important to sustained growth as the opportunities for diversification shrink, which tends to occur as incomes rise. While the movement of labour and investment into higher-productivity industries and specialisation in areas of comparative advantage has expanded production and created employment, labour productivity in manufacturing is still low in many countries. As the gains from increased factor allocation and specialisation fade,

manufacturing industries and firms need to improve their competitiveness to prevent slowdowns in sustained growth. To that end they will have to improve their production methods so to lower costs and diversify products within all industries.

Labour productivity gaps in manufacturing relative to the OECD average are more the result of within-industry differences than structural differences and specialisation in lower-productivity aspects of manufacturing in Brazil, the Russian Federation, China, Indonesia and India (comparable data for South Africa were not available) (Figure 3.1). This would suggest that the potential benefits of inter-industry labour movements in the absence of within-industry productivity growth may be reaching their limits. Future growth in manufacturing productivity will need to come mostly from improvements within sectors rather than through the expansion of higher value-added industries.

Figure 3.1. **Structural differences are not a major contributor to manufacturing labour productivity gaps**

Percentage gap in manufacturing labour productivity relative to OECD average in selected countries, 2009



Notes: The productivity gap decomposition follows the method described by Baldwin et al. (2001). The within-industry and industry-mix effects were calculated using a breakdown of all manufacturing activities into 14 industries. The OECD average was calculated as a weighted average of productivity in the 28 OECD economies for which data were available.

Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

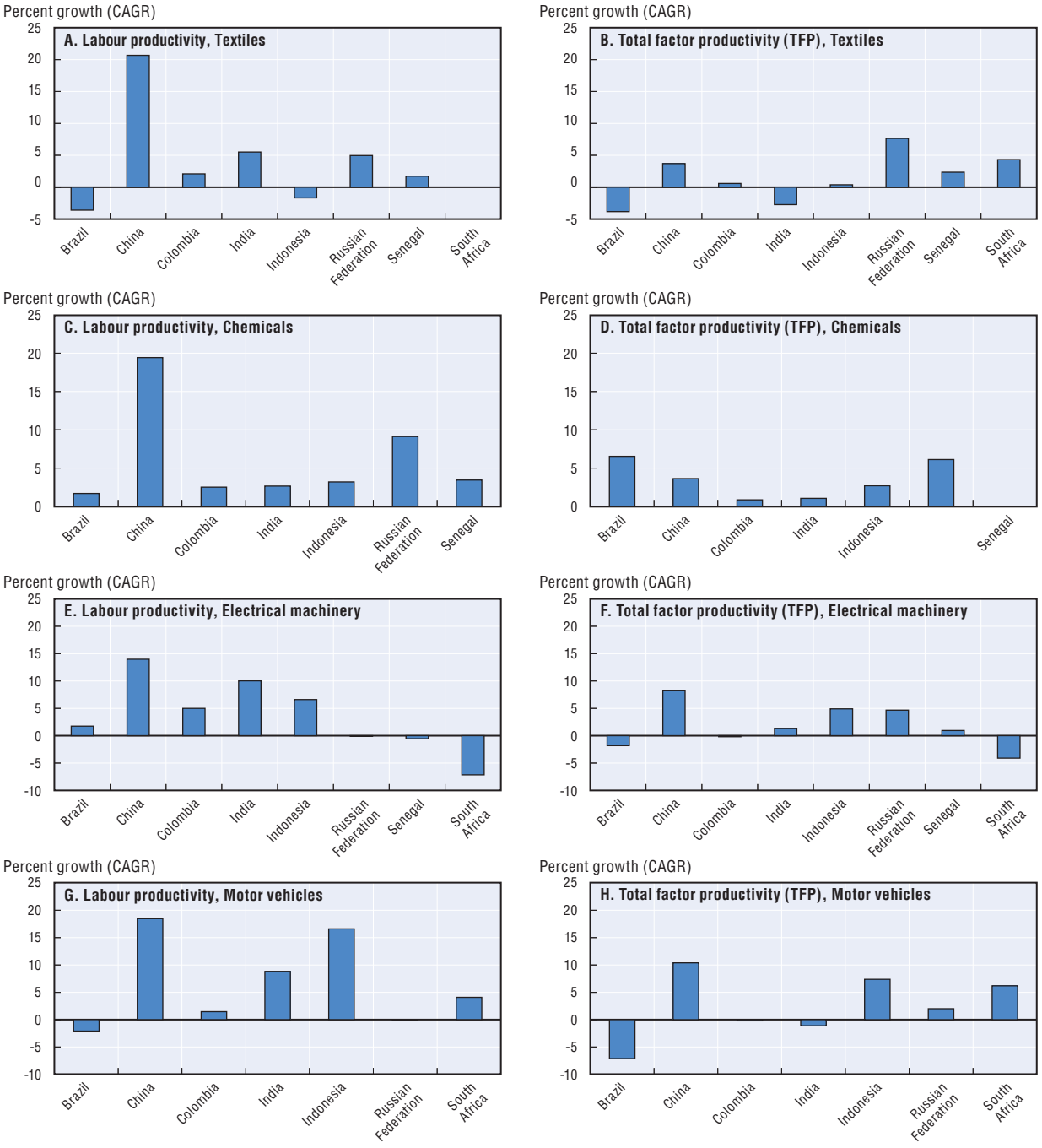
StatLink http://dx.doi.org/10.1787/888933057875

Both labour and total factor productivity are growing in many of the manufacturing industries in emerging economies (Figure 3.2; Table 3.A2.1; Table 3.A2.2). In most cases, labour productivity is growing slightly faster than TFP, suggesting that the accumulation of capital is playing an important role in improving productivity in these countries. In future, growth will need to be increasingly driven by the improvements in technology and management that drive TFP. In most industries, China's growth in both TFP and labour productivity has been the fastest of the nine countries studied here.

Although the dynamics of productivity growth within industries and amongst firms are more complex, firm-level productivity growth is an important and unavoidable necessity for the creation of more competitive industries. Productivity change at the industry level is determined by within-firm growth, the reallocation of output between

Figure 3.2. **Productivity is improving quickly in some key industries in emerging economies**

Compound average productivity growth rates by country and industry, 2000-10



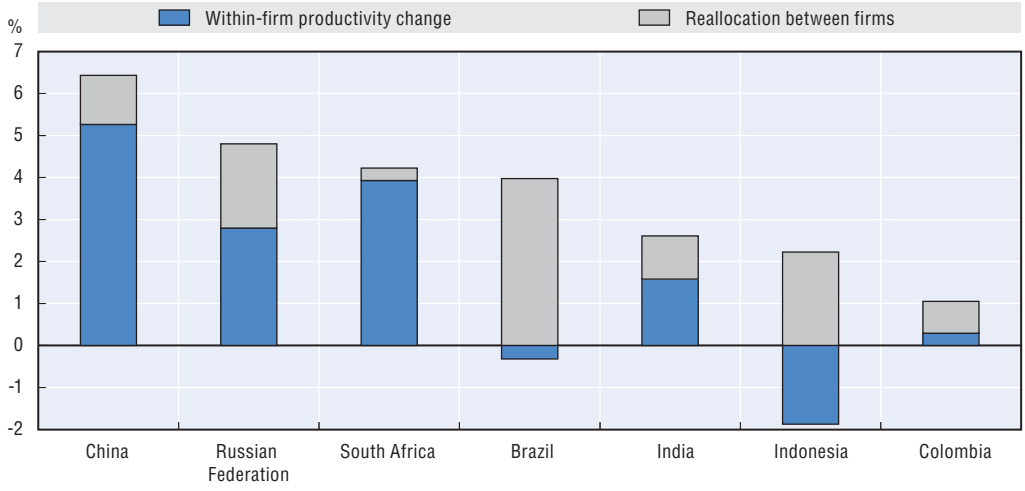
Notes: Firm-level TFP was estimated by country and industry for various ranges of year spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. The figure shows compound average growth rates in output-weighted average industry TFP and labour productivity for firms with TFP estimates, for ranges of available years between 2000 and 2010 (Brazil: 2005-09; China: 2002-09; Colombia: 2005-07; India: 2002-08; Indonesia: 2002-10; Russian Federation: 2003-09; Senegal: 2000-09; South Africa: 2005-08). CAGR stands for compound annual growth rate.
Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933057894

firms with varying productivity levels, and company exit and entry. Among OECD countries, firm-level growth is often, but not always, the most important factor in industry productivity change (OECD, 2011). Considering the BRIICS and Colombia, firm productivity growth tends to be more important than the reallocation of market share in driving manufacturing productivity growth (Figure 3.3). In Brazil, where reallocation effects are dominant, within-firm growth is more important in most industries but overall results are mainly reflective of large reallocation effects in the sizeable basic metals industry. This decomposition ignores the effects of firm entry and exit, which cannot be identified from survey data.

Figure 3.3. **Within-firm effects often affect productivity change more than the reallocation of output between firms**

Average annual total factor productivity (TFP) change, decomposed into within-firm and reallocative effects, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various ranges of year spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. Among the estimations from valid regressions and among firms with TFP results for consecutive years, year-to-year change in output-weighted TFP was decomposed into within-firm and between-firm components, using a method based on that proposed by Foster, Haltiwanger and Kizan (1998) with the effects of firm entry and exit excluded due to data limitations. For comparability, the decomposition was limited to the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Results from 2002 to 2010 by industry were weighted by industry shares in total output to produce manufacturing averages.
Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933057913

Productivity growth at the industry level through allocative efficiency is directly affected by the business environment external to the firm. The improved performance of existing firms and turnover amongst firms are affected by factors external to the firm, which shape opportunities and incentives, and internal factors, which account for differences in performance between firms in the same industry. Within-industry productivity growth is therefore supported by an external environment that provides domestic and international competition while fostering spillovers and policies that encourage firm growth, flexibility and innovation.

The ideal strategies for within-firm improvements in competitiveness are unlikely to be uniform across all industries, as they are shaped by industry characteristics. A firm's scale and investment in innovation and worker training, for example, are strongly influenced by the capital and innovation intensity of its industry. The possibilities for

innovation may also be limited by the scope for quality differentiation in the goods produced by a particular industry, which affects firms' incentives to invest in product-related advertising and R&D rather than in improved production processes.

Finally, the fragmentation of production between firms within and across borders through global value chains – such as those connecting electronics manufacturers across East Asia – creates opportunities for small niche producers to reach productivity levels that may not have been possible otherwise. The lower transaction costs offered by these networks are particularly important in lowering the costs of small producers. Because of the effects of industry characteristics, policies to improve industry competitiveness may need to be tailored to industry-specific needs in addition to the creation of business-friendly conditions that incorporate local particularities. These context-specific factors provide important considerations on how general competitiveness policies can be tailored to particular circumstances.

Fostering a competitive business environment

The competitiveness challenges that persist in emerging and developing economies' manufacturing sectors are partly a result of conditions – determined by a mix of market and policy factors – which are external to the firms operating in them. Although domestic and international competition between firms can motivate industry improvements in competitiveness, this may not be enough to create supportive business environments. Competition can improve industry competitiveness by improving the efficiency of reallocation, motivating firms to become more productive and improving firms' access to higher quality international inputs and management. Active government involvement is often needed, however, in limiting market power, fostering spillovers and developing local capacities to benefit from international openness.

Competition can motivate firms to become more productive and can improve market efficiency

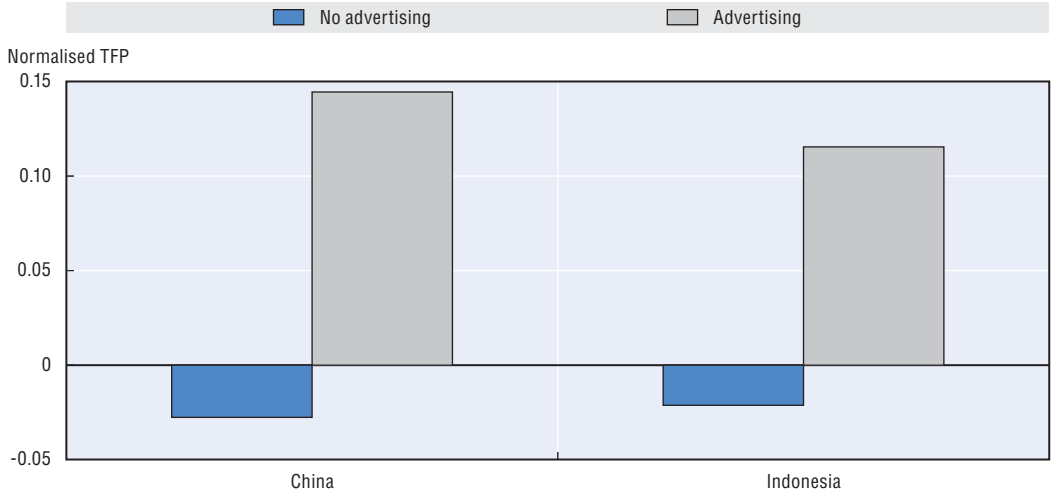
Industry competition can create positive business environments by incentivising firm productivity growth and reallocating market share to the most efficient producers (which may include new entrants). Beneficial competition comes out of policies that reduce barriers to entry and increase access to international inputs, knowledge and markets, all of which help to foster competition between firms. Considering the economy in broader terms, the inter-industry benefits of competition can also include lower prices and better quality inputs for upstream industries and lower buying power that can limit suppliers' profitability.

The main way in which competition affects productivity growth at firm level is by increasing the incentives of productivity gains and the costs of not being competitive. The reallocation of market shares to the most productive firms through competitive markets does not benefit all producers and some less productive firms may need to exit as a result. Having to meet high standards in order to survive in a competitive market encourages low-productivity firms to reform and competitive enterprises to realise their potential increase in market share and profitability. Firms' chances of survival and profitability can be expected to increase together with their productivity. During a period of structural reform aimed at increasing competition in the Colombian manufacturing sector, firms with higher TFP and greater demand for their output improved their market shares (Eslava et al., 2004).

Product differentiation and advertising are examples of firms' responses to competition and are associated with improved productivity and product quality. Manufacturers in China in 2007 and Indonesia in 2006 that spent money on advertising tended to be more productive than their competitors (Figure 3.4). Nevertheless, any cause-effect relationship between productivity and advertising is unclear: advertising may increase firm-specific demand while productive firms may be better able to afford investment in advertising when faced with competition.

Figure 3.4. **Advertising is associated with higher firm productivity**

Average total factor productivity (TFP) by firm advertising, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for different year spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Of the nine countries studied in detail, information on firm advertising was only available in the Chinese and Indonesian datasets.

Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933057932

Competition also improves industry productivity independently of its ability to motivate firms to innovate and reduce costs by facilitating the reallocation of resources to the most efficient producers. As illustrated in the previous section, however, this effect often contributes less to productivity growth than within-firm productivity growth.

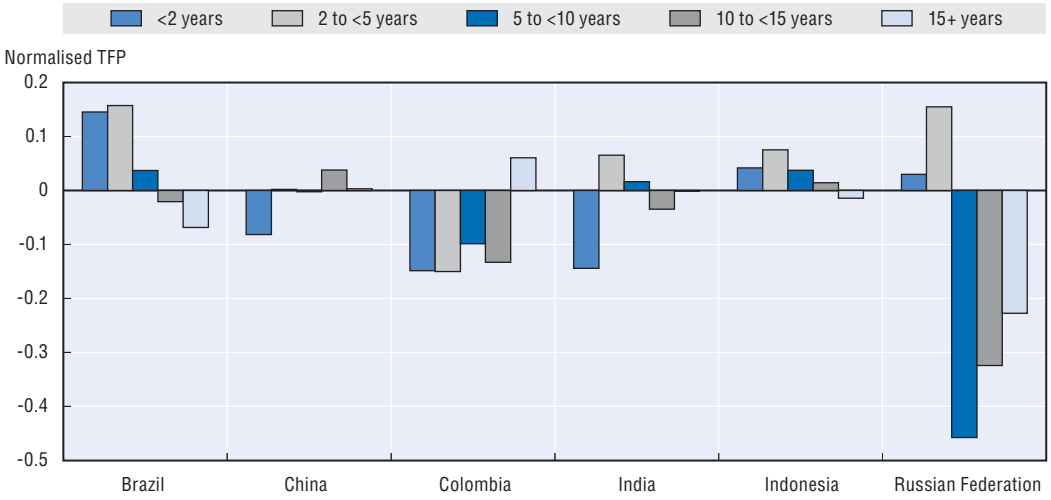
Encouraging new entrants can help increase competitive pressure

The entry of new firms is an important source of competitive pressure and innovative technologies and ideas. While new firms lack experience and reputation, they have the flexibility to adopt new production processes and higher-quality production factors. They are more likely to embrace radical technological change to maximise productivity in a way that differs from the growth of existing firms, even though it may take time before the full productivity impacts of innovations are felt (Acemoglu and Cao, 2010). The process of creative destruction, through which efficient new producers displace established firms, is particularly significant in high-tech industries across developed and developing countries (Bartelsman et al., 2004). Although many new firms fail, the ones that stay the course have strong direct effects on productivity levels and growth.

While younger firms are not necessarily more productive, new entrants that assert themselves quickly improve their productivity. A comparison of firm productivity in five countries for which comparable data on firm age were available shows no clear relationship between a firm's age and productivity after controlling for industry differences (Figure 3.5). Nevertheless, younger firms are as or more dynamic than their peers (Figure 3.6). This comparison is most striking in the cases of India and China, where new firms are the least productive but the most likely to grow quickly. In India, an average of 38% of firms under two years old moved up at least one quintile in national TFP rankings (after controlling for industry differences) in an average year between 2002 and 2010. The share was also high in China where 37% of new firms graduated to a higher TFP quintile on average each year.

Figure 3.5. **There is no clear relationship between firm age and productivity in many countries**

Average total factor productivity (TFP) by firm age, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various year spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Of the nine countries studied in detail, information on firm age was not available in the Cameroonian and South African datasets.

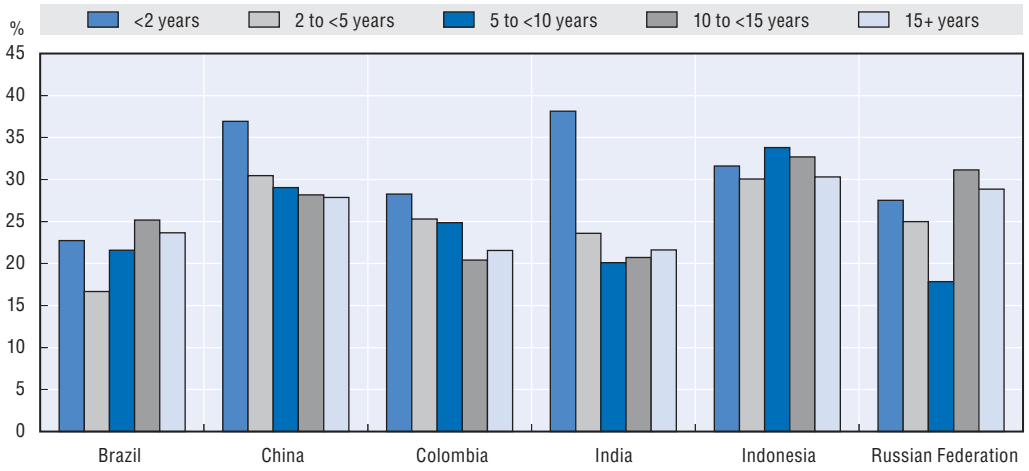
Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933057951

Of course, not all young firms are more dynamic than their peers. The relatively higher growth of new entrants was not true of all the cases studied: in Brazil, Indonesia and the Russian Federation, the change in relative productivity levels were not considerably different by firm age. The apparently higher growth of younger firms is also a result of survivor bias. Many new enterprises fail within the first few years of business and are consequently removed from the sample of firms whose productivity growth is considered. Moreover, given those firms' eventual closure, the distribution of productivity growth among younger firms is likely to be wider than among older firms. This breakdown also shows relatively stable competition between most firms in Brazil and the Russian Federation and firms over two years old in India. In those countries, firms are less likely to show productivity differences with their competitors.

Figure 3.6. **Younger firms may be more likely to improve their relative productivity**

Percentage of firms graduating to a higher total factor productivity (TFP) quintile by age group, average over 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. For comparability, the decomposition was limited to the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. TFP quintiles were defined for each industry and year. The percentage of firms with TFP results for consecutive years which climbed at least one quintile from one year to the next was averaged across industries and available years over between 2002 and 2010. Year-to-year change in Indonesia was limited to 2006-07, due to data availability. Of the nine countries studied in detail, information on firm age was not available in the Cameroonian and South African datasets.

Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933057970

Barriers to entry should be limited and entrepreneurship encouraged to boost competition. Technical, business and legal advisory services and, in some cases, assistance in securing financing for new and small firms can help lower entry costs. Although minimum levels of regulation are needed to protect consumers, prevent anticompetitive behaviour (e.g. collusion) and address production externalities, excessive regulation can raise firms' costs while distorting markets to prevent the reallocation of market shares in favour of more productive firms. The administrative costs of starting a business are particularly important and can exert a significant impact on competition. The median number of days required to register a new firm ranges from 0.5 in New Zealand to 208 in Suriname (World Bank, 2013a).

High tax and regulatory burdens may also encourage the parallel growth of informal economies, particularly where enforcement is weak and penalties for non-compliance are insufficient deterrents. Over-regulation is often conducive to the proliferation of large informal sectors where firms tend to survive at lower productivity levels and which constitute unfair competition for formal businesses.

Imports and foreign investment can increase competition and knowledge flows

In addition to domestic competition, openness to imports and FDI exert positive pressure on industry competitiveness. Foreign firms influence competitiveness indirectly through trade and investment which can increase competition, feed the flow of knowledge and widen access for higher-quality inputs. Although international pressures can lead to reduced domestic production in some areas, they improve within-firm productivity and

allocative efficiency, supporting growth in more competitive areas. Such benefits of international trade mean that strategies for improving competitiveness should consider the liberalisation of trade and investment – e.g. lower tariff and non-tariff barriers and openness to foreign firms and workers – in sectors where competition can yield gains.

Firms with access to imported intermediate goods benefit from reduced prices and improved variety and quality. These inputs can embody advanced R&D, supporting international flows of knowledge and technology. In Indonesia and South Africa – the two countries for which data on firm use of imports were available – manufacturers which use at least some imported inputs have slightly higher productivity than those that do not. In both Indonesia and South Africa, the two countries for which firm use of imported inputs were available, manufacturers that imported at least some of their intermediate inputs were more productive than those that did not, on average.

In fact, the competitiveness of exports is increasingly dependent on access to imports. To improve productivity and remain competitive in a world dominated by global value chains requires access to efficient imports of intermediate goods. Diversified imports can deliver competition-driven productivity gains, as a country's local producers of close substitutes are forced to improve their products in order to stay competitive. Productivity increases not only through this competitive effect but though rationalisation as the less productive firms are forced to exit. In Hungary in the 1990s, for example, Halpern et al. (2011) found that imports accounted for 30% of the growth in aggregate total factor productivity. About 50% of that effect was attributable to import-improved firm-level productivity, while the remaining 50% was the result of the reallocation of capital and labour to importers.

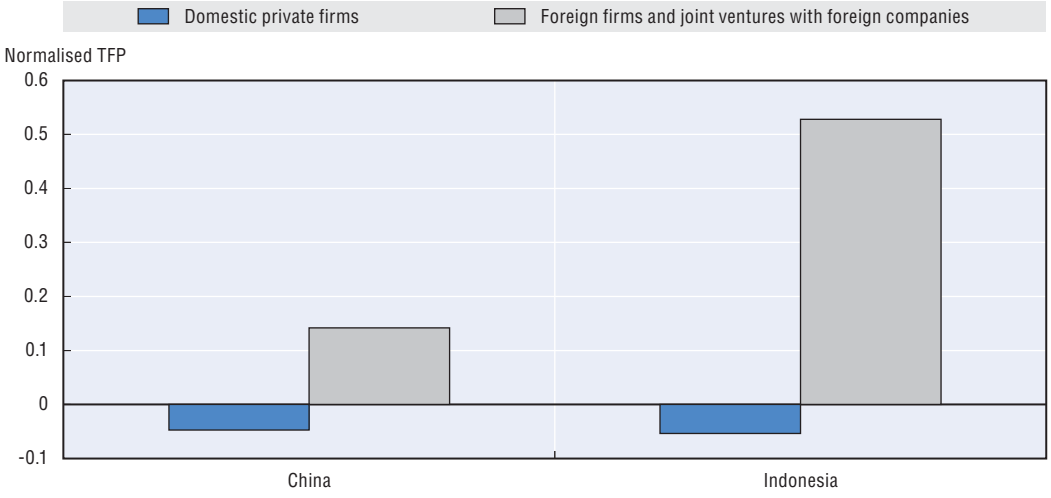
Trade in imported capital goods yields similar benefits, particularly for firms in emerging economies. Global technological development is concentrated in a relatively small number of hub countries. Trade in innovative capital goods drives the international diffusion of technology from those hubs, allowing firms to access more productive capital than would otherwise be available to them. Fan and Hu (2008), for example, find that Chinese manufacturing firms using imported capital goods are more productive than their peers. Barriers in the international trade of capital goods can distort prices and discourage the diffusion of technology through capital imports, however (Eaton and Kortum, 2000).

Aside from possible differences in input quality between closed and open economies, the availability of imported goods in the receiving economy has a significant impact that is akin to the effects of competing on a bigger market: intra-industry competition with imported substitutes raises the level of firm performance needed to achieve a given level of profits. Competition may also, through demonstration effects, spark passive flows of knowledge of the ways in which firms can improve their production processes and the quality of their output. Greater competition in upstream industries prompted by the presence of foreign suppliers, whether of capital or intermediate goods, also enables the reduction of production costs per unit output. The use of imported intermediate goods may affect firm productivity if foreign producers supply higher-quality inputs or if the use of imports also includes access to disembodied knowledge flows through, for example, forward linkages in global value chains.

Foreign ownership of domestic manufacturing, whether through greenfield investment or acquisition, is another driver of productivity growth through the direct and indirect consequences of foreign firms entering the industry. Although foreign firms face disadvantages and risks when operating abroad, they are often more productive than their local competitors. They may have superior knowledge and technology and make greater use of advanced capital and knowledge-based capital. They may also boast superior management skills and organisational capital. In both China and Indonesia, the two countries for which information on firm ownership was available, foreign-owned firms and joint ventures with foreign firms showed higher productivity than domestic privately-owned competitors in 2008 (Figure 3.7).

Figure 3.7. **Foreign-owned firms are more productive**

Average total factor productivity (TFP) by firm ownership, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Of the nine countries studied in detail, information on firm ownership was available only in the Chinese and Indonesian datasets.

Source: Authors' calculations from national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933057989

The sheer performance of foreign entrants boosts domestic industrial productivity directly and can also have positive effects on other firms. The presence of high-productivity foreign firms in an industry produces spillovers that benefit domestically-owned businesses through demonstration, competition, and linkage effects. Foreign investment can help kick-start manufacturing activities in newly industrialising economies and support diversification and technological change in those with more advanced manufacturing sectors. Even the limited liberalisation of special economic zones can be beneficial for the domestic economy (Box 3.3).

Box 3.3. **Special economic zones can help drive growth, but can also create enclave economies**

Special economic zones (SEZs) are geographically defined enclaves separated from the rest of a country's economy where investors enjoy preferential tax and regulatory treatment. SEZs include free trade and export processing zones (FTZs and EPZs), industrial parks and estate and urban enterprise areas. Some SEZs also seek to attract investment in services industries: the China (Shanghai) Pilot Free-Trade Zone, launched in September 2013, opened all sectors not deemed strategic or important to national security.

Although they have a long history, SEZs became popular among developing countries on the Asian continent in the 1970s and 80s. They are now found in many developing regions, though still relatively rare in Africa.

While they are a second-best option to country-wide liberalisation and a good business environment, SEZs may be more politically feasible than nationwide reform. In such an event, special zones can still encourage new investment, technology transfers, and the upgrading of worker skills that spillover into the rest of the domestic economy, primarily through local suppliers providing inputs for SEZs. For gradualist reformers, they are also places for conducting pilot reforms, demonstrating the benefits of liberalisation, and fostering the growth of firms interested in benefitting from reduced tariffs and looser regulations. Korea carried out wide-reaching FDI liberalisation after first testing it in special zones. SEZs may also be established as part of regional development strategies, such as the Shannon Free Zone in Ireland, which was used to help spark growth in an under-developed part of the country. However, SEZs may also be used to delay necessary broader reforms.

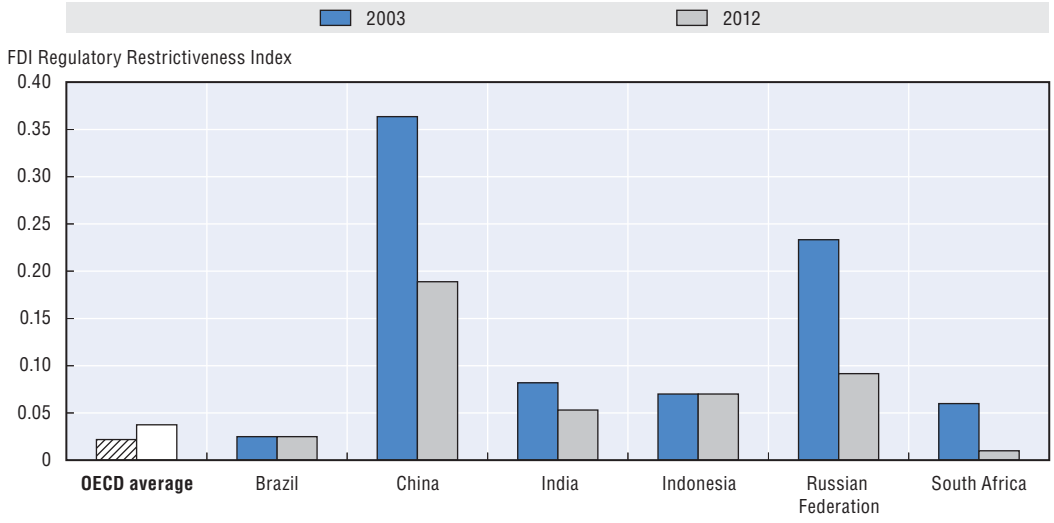
SEZs are no substitute for industrial diversification and productivity growth, and often attract investment in labour-intensive activities such as assembly. Nevertheless, they can help countries that are dependent on primary commodities to gain footholds in manufacturing. An example is Costa Rica, where EPZs drove an increase in the production of textiles and apparel and, later, electronics components. The geographic concentration of production also lowers the cost of providing services and encourages the development of clustered activities.

There is an active role for governments in setting up well-functioning SEZs. At the very least, they have to strike an appropriate balance between worker protection and allowing for firm flexibility, along with the provision of the basic infrastructure and legal systems needed to encourage investment. Meeting requirements in SEZs may be an attractive option for governments in developing countries with limited capacity and resources, as concentrating economic activity lowers the cost of providing oversight, infrastructure, and other services (in addition to the benefits of agglomeration). The private sector is also increasingly absorbing costs through public-private partnerships for developing and operating SEZs. Nevertheless, governments may still need to take additional steps to encourage initial investment through, for example, temporary and limited financial incentives.

Even as OECD members have become slightly more restrictive toward FDI, the BRIICS remain open to it or are gradually liberalising as part of their response to the opportunities FDI affords for improving productivity and raising capital (Figure 3.8) illustrates openness in the BRIICS economies as gauged by the OECD's FDI Regulatory Restrictiveness Index. It assesses burdensome and discriminatory statutory restrictions on FDI by considering four types of restrictiveness – equity limitations, screening and approval requirements, restrictions on foreigners as key personnel, and operational limitations. Some countries

Figure 3.8. **The BRIICS are relatively open to manufacturing foreign direct investment (FDI) or are liberalising**

FDI Regulatory Restrictiveness Index for manufacturing in 2003 and 2012 (1 = closed, 0 = open)



Note: OECD average calculated as a simple average of FDI Regulatory Restrictiveness Index scores for 2003 and 2012 across all countries that were OECD members in 2012.
Source: OECD (2013), *FDI Regulatory Restrictiveness Index*, OECD, Paris, *www.oecd.org/investment/fdiindex.htm*.
StatLink http://dx.doi.org/10.1787/888933058008

enforce tight restrictions in manufacturing industries they consider economically important or politically sensitive. India and Indonesia are most restrictive when it comes to investment in oil refining and the chemical industries, the Russian Federation is much less open to allowing foreigners into the manufacture of transport equipment than into other manufacturing activities.

Of course, regulatory barriers are not the only determinants of investment flows. Of the six BRIICS, China received the largest FDI inflows as a percentage of GDP in 2012, at 3.1%, despite also being the most restrictive toward investment. Firms have been attracted by China's large internal market and low production costs, which help to offset the more restrictive requirements to operate there. China has also been particularly adept at investing in the skills and innovations needed to both attract FDI to maximise positive spillovers for the domestic economy.

Government involvement may also be needed to ensure competitive operating environments

The policies that shape business environments supportive of firm productivity may also need to help develop firm capacities for taking advantage of the opportunities presented by competition. Governments may, for example, need to enact policies that address the effects of low levels of competition in industries with high entry costs, foster the development of clusters and domestic and international spillovers, and help reduce the costs of competing internationally where productivity can be improved.

There are undesirable consequences to both low and high levels of competition that are important to consider in developing an operating environment conducive to competitive firms. High levels of competition can discourage firms from investing in new products and processes, if the potential innovators fear that any advantage gained by so

doing will be eroded when their competitors learn to emulate them. As in other aspects of innovation policy, an appropriate balance therefore needs to be struck between promoting innovation and diffusing it among firms.

Conversely, if firms with market power are able to raise the value of their output through increased mark-ups, then low levels of competition – in protected industries or in those with significant barriers to entry, for example – can damage competitiveness even though it may not be apparent in productivity measures. All other things being equal, improvements in measured productivity produced through high mark-ups are undesirable. They do little to improve competitiveness because higher values are created by increasing profits at the expense of consumer welfare, rather than through improved market efficiency. High mark-ups are also associated with lower productivity growth rates, as high profits and low competition discourage innovation (Aghion et al., 2008).

Elevated mark-ups appear to be associated with higher industry TFP in a number of countries, most notably in India, Indonesia, and the Russian Federation, suggesting that non-competitive markets may contribute to the apparently high productivity of some industries (Figure 3.9). The high mark-up industries are different in the three countries:

- in India, the highest mark-ups are in recycling, publishing and computer and office equipment;
- in Indonesia, they are in non-vehicle transport equipment, apparel and tobacco;
- in the Russian Federation, they are in furniture and other manufacturing, publishing and non-metallic mineral products.

This country-level variability suggests that certain industries may not be particularly sensitive to the development of market power and that market power varies more within particular country contexts (Table 3.A2.3).

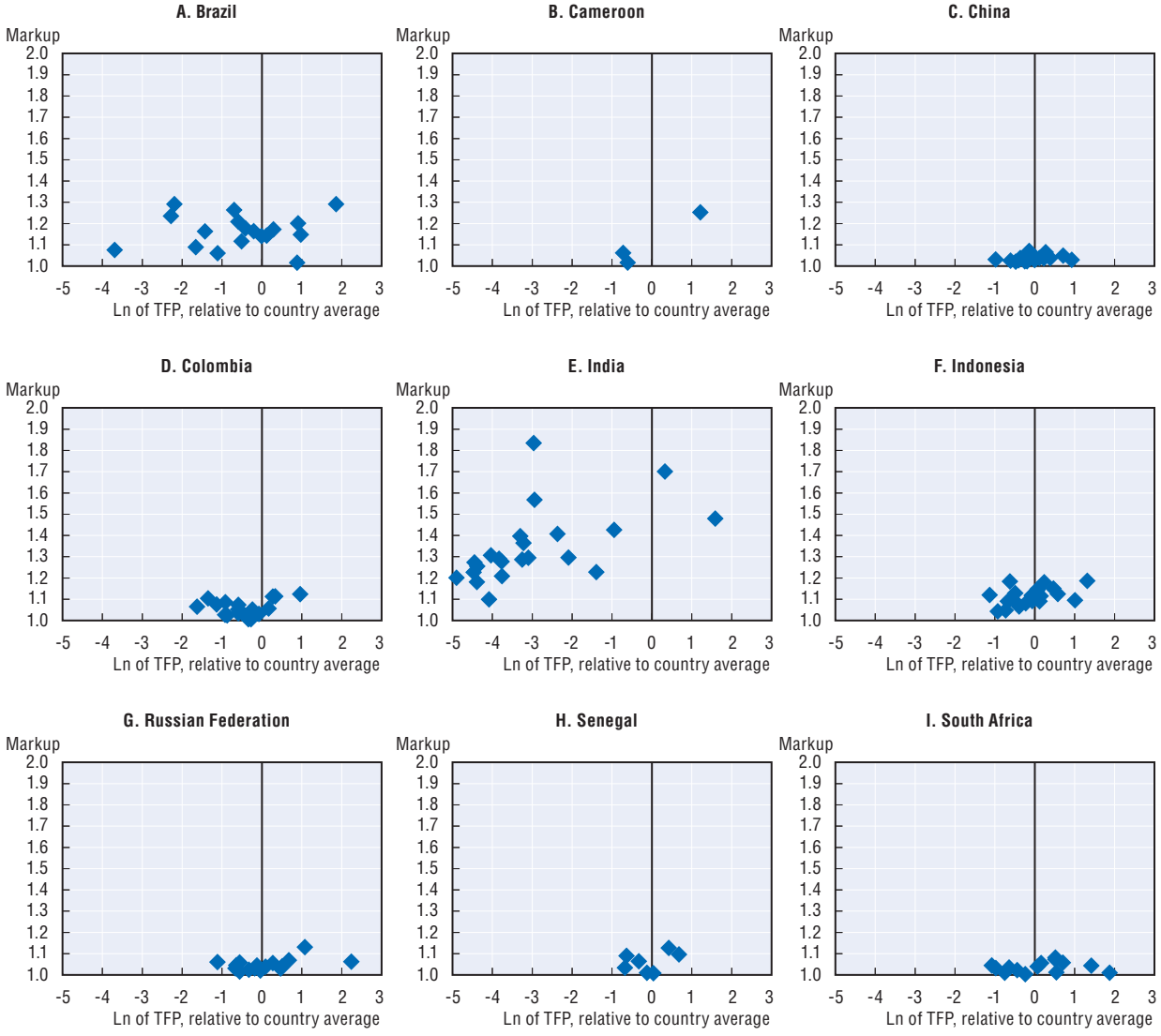
Positive correlations between mark-ups and productivity may also be caused by the negative consequences of high competition, as firms often benefit from being exposed to productive competitors. Spillover effects through multiple channels afford greater access to high-quality inputs or inter-firm knowledge transfers. Demonstration effects, where foreign or domestic high-productivity producers show new products and processes at work, may prompt firms to emulate them if they deem that their products and process are desirable for them. Similarly, when new managers and workers join a firm it benefits from the knowledge and skills they have built up elsewhere.

In addition to such horizontal spillovers within industries, improved productivity can be the outcome of forward vertical linkages with suppliers that yield higher-quality inputs and backward linkages with customers that supply better information about product design and demand. Governments can encourage productive spillovers by leading the development of clusters. Key tools in this respect are infrastructure and public services that targeted industries and geographic locations, if firms need to be physically close to reap the benefits of clusters. The importance of regional factors and clusters in determining competitiveness is discussed further in Chapter 5.

Governments should also, at times, manage foreign competition to ensure that domestic firms reap the benefits. While FDI can introduce new technology and knowledge and demonstrate its applicability in a recipient country, they will diffuse through the local economy only if domestic absorptive capacity is sufficient. In the absence of these capacities, foreign-owned enclaves form within the economy. Mexico, for example, has had

Figure 3.9. **Low competition may drive higher productivity estimates in some countries and industries**

Industry total factor productivity (TFP) relative to manufacturing averages and mark-ups



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. Estimations from valid regressions were weighted and summed by industry output shares to produce industry averages, which were then divided by the total manufacturing average for the country, calculated similarly. Mark-ups were estimated by country and industry using simple OLS regression models to estimate profit maximising and cost minimising production functions.

Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058027

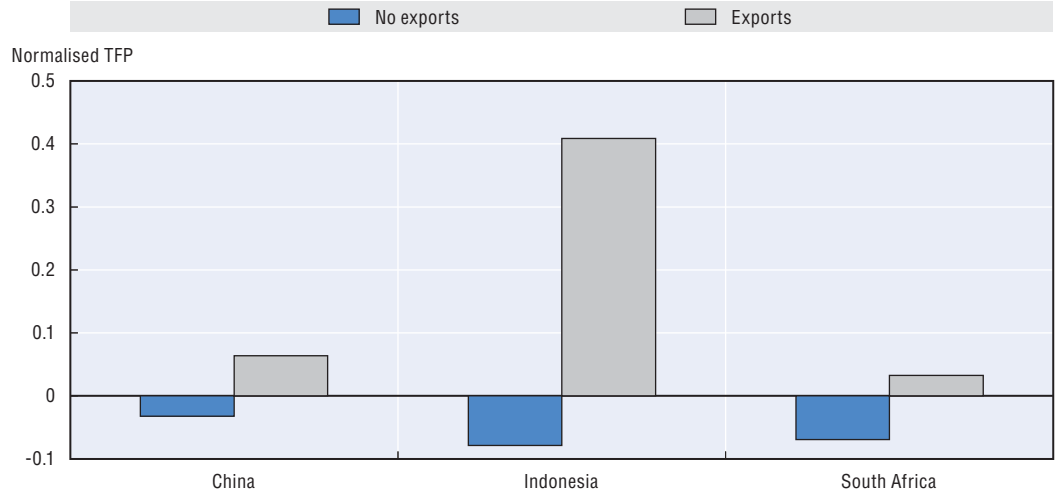
considerable success in using FDI to drive development in its automotive sector, while other processing and assembly activities near the border with the United States have remained largely disconnected from the rest of the economy. In cases such as this, countries can adjust FDI policy and related areas of regulation to facilitate investment in areas where there is scope for improving domestic competitiveness. Ireland did just that when it developed its domestic technology industry, as did China when it expanded into advanced manufacturing. However, these strategies also need to be backed by broader reforms to education and business development.

Protection for infant industries to help reduce barriers to entry and allow firms to improve their competitiveness through learning-by-doing and efficient scales of operations, may even be acceptable. It must, however, be limited in scope and time. Targeted firms and industries should have demonstrated their competitiveness and ability to develop or adopt new technologies under protection. Policy makers should also consider the externalities of temporary protection, which may encompass potential distortions or competitiveness spillovers into related industries – as happened when Malaysia developed its automotive industry (see above). Gradual, expected exposure to international competition helps to motivate firms to improve their productivity, even though the pressure groups that form under state protection are likely to oppose any weakening of their privileged position, making liberalisation politically challenging.

Aside from protection, governments can also support industry competitiveness by assisting firms in overcoming the additional transaction costs associated with exporting and developing overseas customer bases. Exporting companies in China, Indonesia and South Africa, three countries for which such data were available in 2008, tend to be more productive (Figure 3.10) – a result either of the more productive firms' self-selection into the export market or of productivity gains acquired through exporting. Exporting can facilitate flows of knowledge and technological development through vertical linkages, as firms' participation in global value chains exposes them to customers. Foreign clients may share information on product designs, production processes, and training. Access to larger markets also allows firms to specialise their production and capture economies of scale that may not otherwise be possible if they were to produce only for the domestic market.

Figure 3.10. **Exporting firms tend to be more productive**

Average total factor productivity (TFP) by firm exporting, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Of the nine countries studied in detail, information on firm exporting was only available in the Chinese, Indonesian and South African datasets.

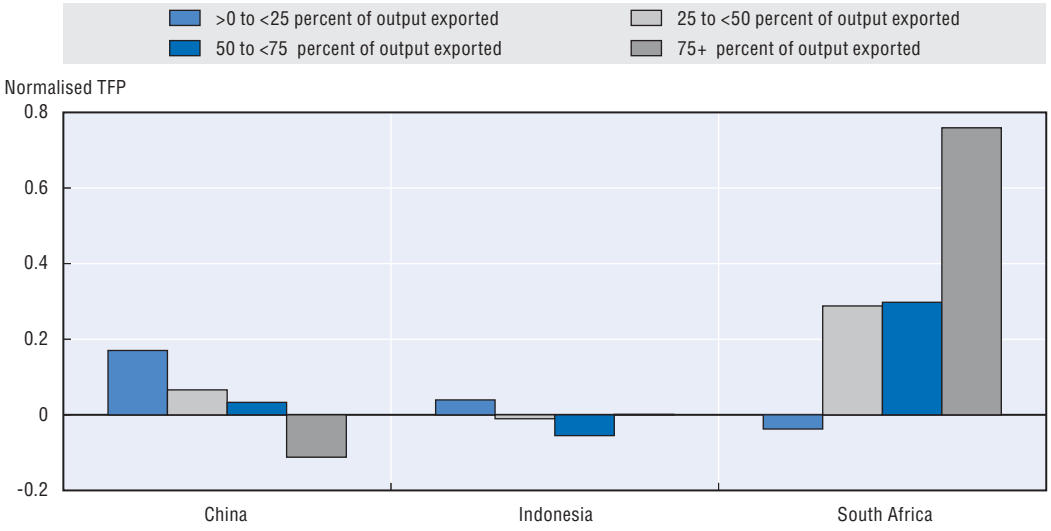
Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058046

Exporting may be more likely to be a result of high firm productivity, rather than a cause of better performance. As in the model of heterogeneous firms proposed by Melitz (2003), entering export markets is a costly action rewarding firms with productivity levels above a threshold. The Melitz model can explain why the productivity of exporting firms in China and Indonesia does not increase with the share of production they sell abroad, as might be expected if exporting were the cause of higher firm productivity (Figure 3.11).

Figure 3.11. **Productivity does not necessarily increase with firms' export intensity**

Average total factor productivity (TFP) by firm export intensity, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Of the nine countries studied in detail, information on firm exporting was only available in the Chinese, Indonesian and South African datasets.

Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058065

Competitiveness policy may therefore seek to increase exports on the extensive margin by fostering a larger number of exporting firms. Even if it does not raise firm productivity, exporting can improve industry productivity by allowing top-performing firms to expand their output. However, because the costs of exporting can nevertheless prevent firms from seizing export opportunities, governments may have a role to play in lowering export costs. Policy options include broad forms of support, such as improving trade infrastructure and administration, developing a country brand and leading trade missions/fairs and negotiating the settlement of trade in local currency. Some potentially more targeted forms of support may be to offer assistance on meeting international standards and to provide export credit for firms with difficulty otherwise accessing finance.

Encouraging the development of competitive firms

Along with reforms addressing the business environment, improvements in competitiveness require the emergence and growth of more productive and efficient firms, which governments can promote through facilitating policies or obstruct with poorly-designed interventions. The internal factors that affect firm competitiveness and create within-industry heterogeneity in productivity levels and growth rates are ultimately determined within the firm. Nevertheless, such factors are not always shaped by design and are often dependent on conditions external to the firm, such as the availability of quality inputs and regulatory incentives. Competitiveness is affected through multiple channels by a firm's scale and scope and its access to knowledge and innovation – both disembodied and in the quality of the production factors employed.

Firms need opportunities to reach competitive scales

Large firms tend to be more competitive, though smaller firms may also be very competitive in industries where their flexibility and connections with larger suppliers and customers give them an edge. The advantages enjoyed by large firms stem from their internal economies of scale and easier operating environments. Policies designed to support small firms can actually discourage their expansion if threshold effects where firms past a certain size are treated differently create high marginal costs to growth. However, well-designed SME strategies can help them to grow or to become highly competitive as flexible niche producers.

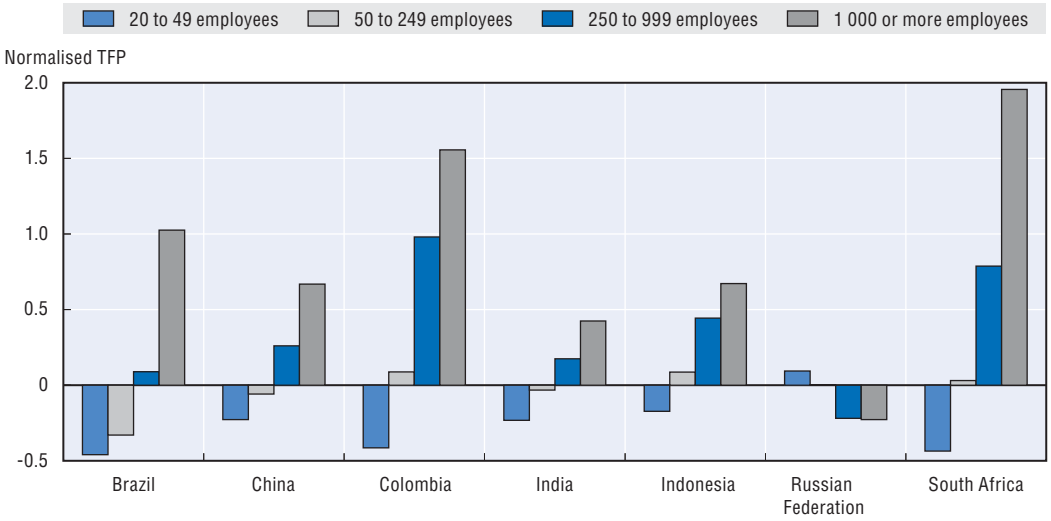
Minimum fixed costs can also be relatively higher for smaller firms, raising their average production costs. The effects of indivisible capital costs, such as machinery and equipment, on smaller firms' costs are best illustrated through comparisons of TFP and labour productivity by firm size. In Brazil, China, Colombia, India, Indonesia and South Africa, TFP tends to increase with firm size (defined in terms of employment), highlighting the importance of economies of scale in manufacturing (Figure 3.12). In Russia, where new and small firms have become important sources of productivity growth in recent years, the relationship between size and productivity is slightly negative.

Even in countries where larger firms have higher productivity measured in TFP, output per worker can be unrelated to firm size or even decline with employment (Figure 3.13). This is the case in Brazil and China, where smaller firms boast among the highest levels of labour productivity. Diluted capital costs help create economies of scale and the high TFP of some larger firms is partly a result of their use of relatively less capital and intermediate goods per worker than smaller firms. Controlling for industry differences, capital-labour ratios are smallest among manufacturers with 1 000 or more employees in most of the countries studied here.

Although the expansion of smaller businesses can make a substantial contribution to industry-level productivity growth, external constraints may also discourage SMEs from growing to more efficient sizes. Larger firms have a number of advantages, particularly with respect to financing, which is essential to firm growth. Small companies are less likely to raise funds through capital markets and face greater hurdles in accessing bank credit, due to their relatively higher transaction costs and the greater risks faced by investors and lenders, compared with more stable large firms. Credit guarantees for smaller firms may be one solution to these problems, if SMEs with growth potential can be identified. Indeed, among the respondents of the World Bank Enterprise Surveys in 103 countries from 2006

Figure 3.12. **Total factor productivity (TFP) tends to increase with firm size**

Average TFP by firm size, normalised by industry and year, 2002-10



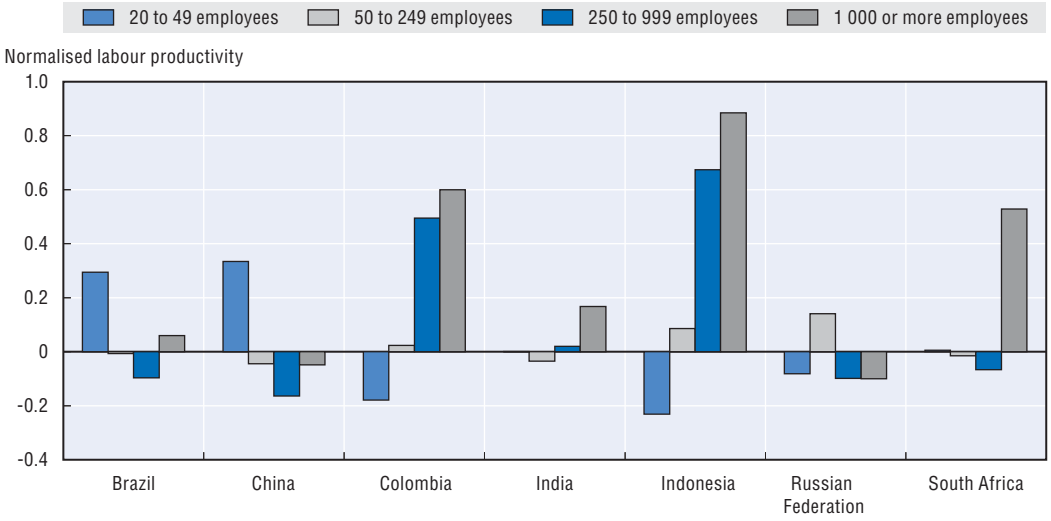
Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34.

Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058084

Figure 3.13. **Labour productivity often does not increase with firm size**

Average output per worker by category, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. Output levels per worker – deflated to 2002 prices and converted using the average 2002 to 2007 euro exchange rate of observations with valid TFP results (to ensure comparability with Figure 3.11) were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34.

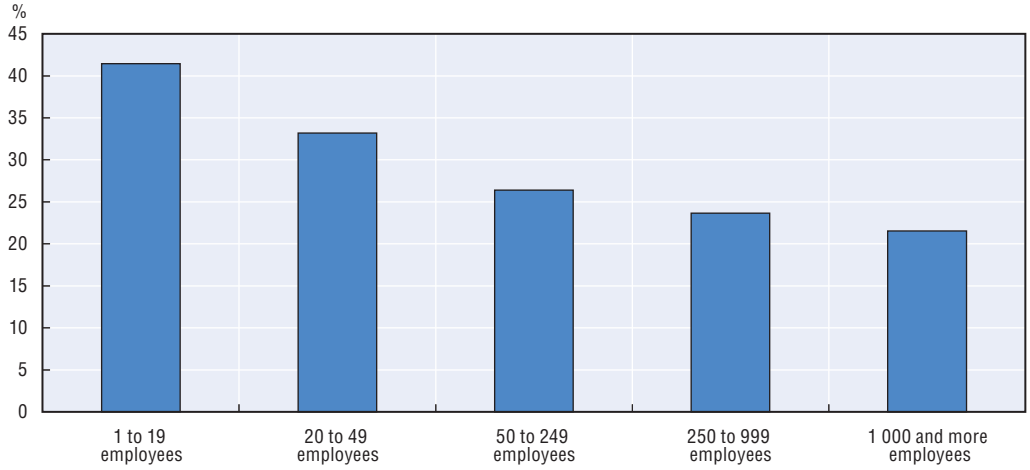
Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058103

to 2011, bigger enterprises tended to harbour less serious concerns about access to finance (Figure 3.14). Industrial policies – such as subsidies and investment incentives with minimum scale requirements – often also favour companies that have already grown large, and the administrative burdens of tax and regulatory compliance are likely to weigh heavier on SMEs.

Figure 3.14. **Smaller firms are more likely to see access to finance as a serious constraint**

Percentage of firms reporting financing as a "major" or "very severe" obstacle to current operations, by firm size



Notes: The percentage of firms describing access to finance as either a "major" or "very severe" obstacle to current operations was calculated, by size category, for 103 countries, using the most recently available data from the World Bank Enterprise Survey between 2006 and 2011. This figure shows the simple averages of country-level results across all 103 available countries.

Source: Authors' calculations based on World Bank (2013), *Enterprise Surveys* (database), World Bank, Washington, DC.

StatLink http://dx.doi.org/10.1787/888933058122

Support for small firms designed to offset their challenging operating conditions can also, in practice, discourage their growth. Size-dependent policies that grant preferential treatment to smaller businesses – such as reduced tax rates and looser regulations – can create high marginal costs to growth for firms close to the size at which support is cut. In India, for example, the missing middle (a relatively small number of mid-sized manufacturers) has been blamed on the more stringent labour protection rules for firms above a certain size, which discourages business from seeking to expand beyond that threshold size. Taken together, large firms' greater ease of doing business and the unintended incentives for small companies to stay small can prevent the healthy growth of SMEs with high productivity potential. Frameworks and policies should seek to foster entrepreneurship and company growth, while also encouraging additional output among the most productive businesses.

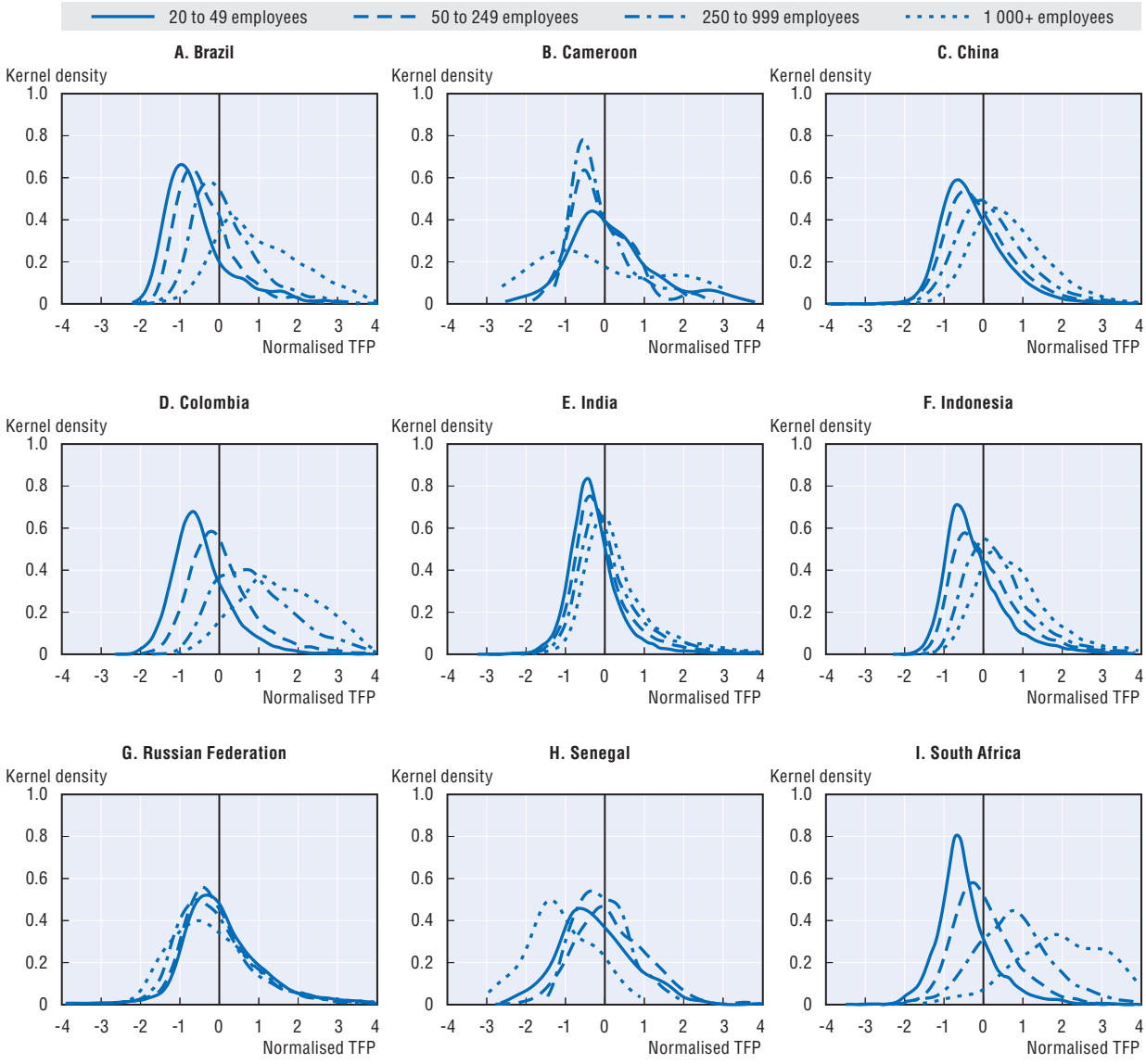
While TFP tends to be higher the larger a firm is in many countries, there are significant overlaps in the productivity of different sized businesses in all nine countries considered in Figure 3.15. Factors other than size also affect productivity levels, and the advantages that large firms enjoy may differ according to their fields of business. A big company's economies of scale are limited to sizes below the point of diminishing returns and additional output begins to raise per-unit costs – or after which dividing into smaller

units would raise its productivity. The impact and extent of economies of scale vary with the type of work a firm does and the environment in which it operates. Diseconomies of scale are likely to arise when the size of plants or firms complicates their management and bottlenecks in production become prohibitively expensive to overcome.

The emergence of global value chains and technology-intensive manufacturing have created new opportunities for niche producers to exploit the benefits associated with small scale in some industries. SMEs have been hailed as a major strength of Chinese Taipei's

Figure 3.15. **There are significant overlaps in the distribution of firm total factor productivity (TFP) by size**

Gaussian kernel distribution of the log of firm productivity, by size, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2010 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. The figure shows the distribution by size category of firm-level TFP estimates results for all available years between 2002 and 2010, normalised within industry and year. The tails of these distributions were cut at four standard deviations from the size category mean for visual clarity.
Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058141

economy with their highly specialised and low-cost production (Box 3.4). The opportunities for specialisation through such arrangements and the reduced transaction costs of supplying few major customers, combined with the flexibility of smaller firms, can produce strong performance not otherwise attainable by niche producers. Policy makers should recognise the unique challenges and opportunities for small firms in fragmented production networks.

Closely related to economies of scale is the concept of economies of scope: the reduction of costs through the joint production of more than one kind of output. They take various forms – from risk diversification, complementarities in promotion, and internal innovation spillovers to spillovers and complementarities among the work of managers and administrative staff. Multi-product firms may also be more active exporters, selling more internationally and in more markets (Goldberg et al., 2012; Bernard et al., 2011). Regulation by industry or product should take into consideration the potential development of economies of scope, and not discourage firms from finding complementary fields of production where they exist.

Box 3.4. **Chinese Taipei's SMEs thrive thanks to a supportive business environment and targeted policies**

Small- and medium-sized enterprises (SMEs) are particularly important drivers of Chinese Taipei's remarkable growth since liberalisation in the 1980s. They remain central to its economic structure, largely thanks to targeted support and an environment favouring flexible producers. In 2010, more than 97% of companies were SMEs which accounted for 78% of all employment. While they increasingly operate in the services sector, SMEs played a major role in driving earlier phases of Chinese Taipei's export-led industrialisation. They remain particularly important in niche manufacturing roles.

Active government support through the provision of services and financing assistance has helped SMEs to become highly competitive despite the challenges of operating on small scales. Publicly provided services and advice on the technical aspects of product quality improvement and exporting and on legal matters help to reduce the relatively high fixed costs faced by SMEs. Credit guarantees covering most of the amounts borrowed from financial institutions enable start-ups and smaller firms to access formal sources of financing. Direct subsidies are also provided for firms engaging in innovative activities, such as through the Small Business Innovation Research Program (SBIR). Other sources of funds, like reduced-rent industrial areas, are also offered to support SMEs and entrepreneurship. In addition to targeted support programmes, Chinese Taipei's SMEs benefit from operating in a business environment where it is easy to establish and close firms.

SMEs' flexibility is particularly important in the volatile electronics industry, where small, nimble manufacturers – with the advantage of having access to a well-educated workforce – are able to adapt to unanticipated changes in demand and technology. Even smaller firms that received less protection in the era of import substitution policies emerged from that period more competitive than their larger competitors. They nevertheless benefit from domestic connections with large suppliers, customers, and distributors and from international connections through global value chains.

Competitive firms use higher-quality inputs more efficiently

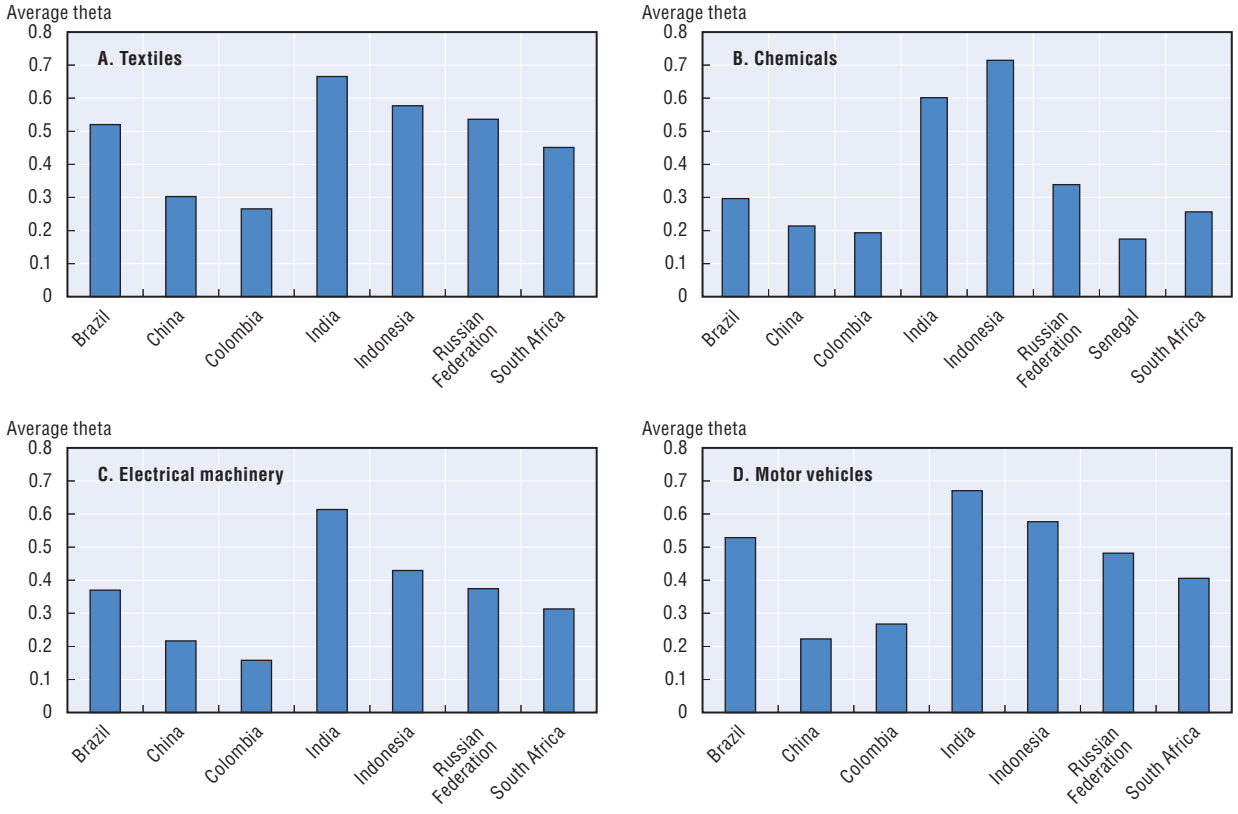
Flexibility in the use of production factors, which requires few regulatory distortions and the availability of appropriate high-quality inputs, is an important component of competitiveness. Heterogeneity in the quality of inputs used has long been considered an

important explanation for variations in firm-level productivity (Griliches, 1957). Measures of productivity based on the amount of labour, capital and intermediate inputs may not be able to control for heterogeneity in factor quality, changes in their productivity while employed by a firm, or the efficiency with which input combinations are used. Yet, all these factors are important in determining firm competitiveness.

The intermediate goods used by firms also affect productivity through their quality and suitability to each firm's production. As discussed above, imports are a valuable way of improving the quality of intermediates. Competitiveness can be measured not only as the relative performance of firms in maximising outputs, but as an outcome of the quality of labour, capital and intermediate inputs and the appropriateness of the proportions in which they are used. The concepts of quality and appropriateness are both captured by measuring the technical efficiency of production costs (the rental cost of capital used and intermediate and labour expenses in nominal terms) in generating output and profits. There is significant variation by country in the relative performance of firms in using factors of production in key manufacturing industries (Figure 3.16). Manufacturing efficiency tends to be higher in India, Indonesia and the Russian Federation (Table 3.A2.4). While those countries do not necessarily boast the highest productivity, they make more efficient use of the inputs available.

Figure 3.16. **Technical efficiency varies widely by country in both high- and low-tech manufacturing**

Average technical efficiency scores in selected industries, 2007



Notes: Estimations were made using 2007 data, except for South Africa, where 2008 data were used for reasons of availability. Technical efficiency was estimated at the firm level across available countries by industry (2-digit ISIC Rev 3.1 categories). Firm-level thetas (equal to one minus the distance to the efficiency frontier defined by the most efficient producers in the sample) were aggregated by industry after being weighted by firm shares of national output in the given sector.
Source: Authors' calculations, using firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058160

Differences by country in productivity and efficiency are also affected by the flexibility of a firm's input use, which is determined by regulation and market factors. China performs poorly in these measures of relative efficiency. Although it boasts a higher degree of labour market flexibility than most of the other BRIICS, it has relatively low levels of capacity utilisation. This situation has deteriorated since the start of the global financial crisis – high investment rates and a drop in demand pulled capacity utilisation from near 80% before the crisis in 2008 to around 60% by 2012 (IMF, 2012).

While some level of worker protection is important, a significant lack of labour market flexibility, often the result of stringent hiring and firing regulations, can reduce efficiency. Stringent labour regulation may deter hiring or result in labour hoarding – i.e. firms continue to employ underused labour, though they may do because they are keen to retain skilled workers. Similarly, fluctuations in demand can leave businesses with inefficient levels of capital. Firms need to adjust their use of inputs as market conditions change, and efficient inter-industry competition can be the most effective way of allocating inputs among companies. Increased factor acquisition may, however, be more beneficial for efficient producers, where fewer resources are left idle.

Innovation and skilled workers may be needed for firms to be more productive

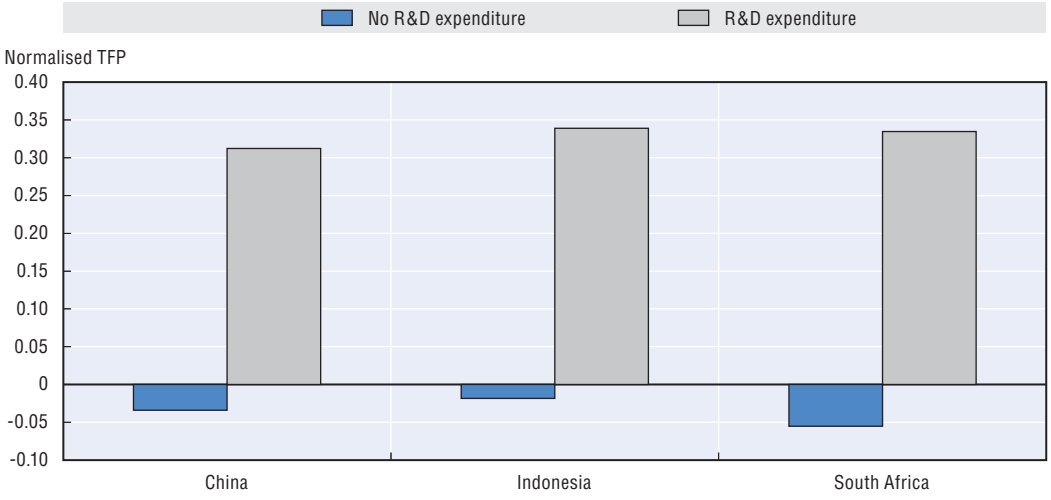
Firms that use advanced technology and skilled workers to adopt and develop new products and processes tend to be more competitive. While there are practical limits to the productivity gains that firms realise through economies of scale and scope, technological improvements can be a continuing source of improved output for a given level of input use. Because technology and labour skills complement each other, the use of advanced machinery, equipment and processes must be backed by the hiring of skilled workers and the development of employee skills. Governments have important roles to play in facilitating innovation and improving education systems. Leading firms often engage in research and development (R&D), which can raise productivity and is mainly within the reach of successful producers. Productivity among firms in China, Indonesia and South Africa that reported R&D spending was higher than among those that did not (Figure 3.17).

In addition to innovating through investment in R&D, firms expand their productive capacity from externally developed knowledge and technology. Physical capital affects productivity through its innovative nature and the quality of its use. Certain technological developments may be embodied in capital goods, in that advanced machinery and equipment may be more productive in generating existing output or higher-value alternatives. Improvements in capital through embodied technological change can have a considerable impact on firms' productivity and aggregate productivity growth (Sakllaris and Wilson, 2000). Firms also acquire the benefits of innovation through corporate partnerships and the licensing and purchasing of technology and knowledge-based capital, a broad concept covering software, patents, other types of intellectual property, and knowledge products and services tailored to their operations. Greater exposure to available sources of innovation and technology expands a company's range of possible options.

Policies to encourage innovation include broad measures like improving basic and more targeted advanced or vocational education, increasing public investment in research, and adapting global knowledge to local capabilities. Enterprises may also need backing for their innovation activities to offset reasonable risk, e.g. the risk that spillovers may erode the benefits of their innovations. Among the most important policy challenges is finding

Figure 3.17. **Research and development (R&D) is associated with higher productivity**

Average total factor productivity (TFP) by firm R&D expenditure, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Of the nine countries studied in detail, information on firms' R&D expenditure was only available in the Chinese, Indonesian and South African datasets.
Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058179

the right balance between protecting innovators' exclusive rights and promoting the widespread dissemination of their innovation. A well developed, properly enforced system of contracts and intellectual property rights is therefore necessary.

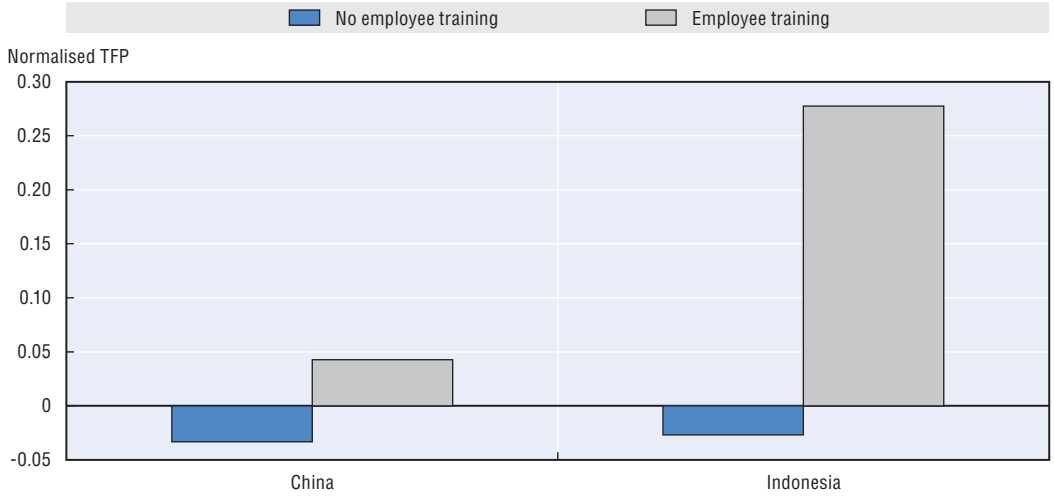
Employee skills complement technological development. They can hold company innovation back if they are not of a high enough standard to make the best use of advanced equipment. Similarly, skilled workers will be most productive working with technology that best complements their skills and knowledge. Employers therefore need to consider training and workforce restructuring as components of any innovation strategy. As effective leadership is also needed to implement change, attracting or training skilled managers is another essential element of adopting technological change.

Human capital – the measure of the quality of labour inputs – is affected by workers' formal education, on-the-job training, experience and other determinants of skills. It must be used in a way that complements technological innovation. Although the provenance and quality of formal education available to a firm depends largely on factors external to the firm, differences between the educational qualifications of companies' workers and managers are important determinants of productivity differentials. Firm productivity in Indonesia (the only country for which data on employee education are available) increases as the share of secondary school graduates in the workforce increases, accelerates further as the share of undergraduate degree-holders grows, and rises faster still with the proportion of employees holding graduate degrees rises – even after controlling for industry differences that may determine both technological intensity and demand for highly-educated workers.

In China and Indonesia (two countries for which data were available), companies that invest in training their workers enjoy moderately higher productivity levels than firms which do not (Figure 3.18). Training helps workers use equipment more effectively and can be used to standardise production processes. The effects of workforce training, however, vary from company to company and facility to facility, shaped by a host of other factors, including employees' educational qualifications and skills level. Put briefly, the development of human capital tends to involve many mutually complementing factors. The returns to investment in job training may be higher among educated or experienced who are more productive regardless of the additional training they receive at work. Firms also benefit most when training costs are distributed over a longer period of time, increasing the relative returns of training younger and longer-term employees (Carneiro and Heckman, 2003).

Figure 3.18. **Productivity is higher in firms that provide worker training**

Average total factor productivity (TFP) by firm expenditure on worker training, normalised by industry and year, 2002-10



Notes: Firm-level TFP was estimated by country and industry for various time spans between 1998 and 2011 using an OLS regression model with fixed effects of output by employment, productive capital, and intermediate goods. These estimates were normalised by industry and year, averaged by firm category. For comparability, the decomposition was limited to valid estimations from 2002-10 for the following manufacturing industries (ISIC Rev.3) and the countries for which TFP estimates for all thirteen of these industries were available: 17, 18, 19, 22, 23, 25, 26, 27, 28, 29, 31, 32 and 34. Of the nine countries studied in detail, information on employee training by firm was available only in the Chinese and Indonesian datasets.

Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058198

Improvements in human capital need not be formal or planned: learning externalities may be the result of personal experience and interaction with others. Workers learn through experience and specialising in particular tasks allows them to improve specific skills. They also learn from the skills and experience of their peers – in other words, the productivity of skilled workers may have spillover effects within a firm and particularly high-productivity employees may have a greater effect on overall productivity than what they produce individually.

Governments have a significant role to play in supporting innovation by providing education and basic research services, which includes adapting global knowledge to local needs and, increasingly, as the economy becomes more innovative, original research. Such services need to build into their design recognition for the country's level of development

and fields of competitive advantage. Targeted education programmes, such as vocational education (Box 3.5), should be designed in consort with the private sector to supply required skills. In many developing and emerging countries, innovation will be more about accessing and adapting global knowledge than developing new products and processes. More direct forms of support, such as innovation and training subsidies, may also encourage firms to expand into activities with high growth potential.

Box 3.5. **Vocational education programmes can help provide the skills needed by firms**

As described in the OECD's *Learning for Jobs* (2010), vocational education and training (VET) encompasses a diverse range of programmes within and outside formal education systems to help people gain the skills that they need in particular fields of work. They help fill the gap between basic education and the occupation-specific training provided by employers, who may underinvest in their workers or fail to acknowledge the value of building transferable skills. Occupational education may target young school leavers about to enter the workforce or continue their education. It may also address older workers through lifelong learning programmes that help them to upgrade their skills and transition into new industries.

Successful VET programmes are designed in response to demand, incorporate appropriate balances of classroom and applied learning, and give learners qualifications that formally state the skills they have acquired. Institutions that function at the national or regional level and either across or within sectors should collect input from employers on the skills they look for. Curricula can then be developed to incorporate the priorities of government, learners, and employers who, ideally, should also share the costs of VET schemes in proportion to the benefits they stand to gain. While China has had some success in establishing vocational schools at the upper-secondary level (about half of all students go to vocational schools), it needs to improve the quality of school programmes – particularly their workplace training components – and design syllabuses that meet labour market needs.

VET programmes can also be made more effective by including significant workplace learning, as long as students are not treated merely as providers of cheap labour. Workplace learning gives students direct exposure to the field, helping them to develop both hard and soft skills such as teamwork and communication. It can also facilitate recruitment and inform students about employers' needs and areas of skills shortages. In addition to employer-provided training programmes, workplace learning may take the form of job shadowing, volunteering, internships, and apprenticeships.

Although long established, apprenticeships – in both traditional and, increasingly, high-tech occupations – vary considerably in their design. In Germany, where vocational education programmes are well-developed and in which 60% of young people enrol at the upper secondary level, apprenticeships are "dual system", i.e. they combine in-school and workplace training.

Qualification systems that provide standardised assessment and recognition of prior (formal and informal) learning can improve worker mobility, matching and opportunities for continuing education by providing a reliable skill indicator. Recognition of past learning has been offered in France since the 1970s and the introduction of the *validation des acquis professionnels* (VAP) in 1992 (since replaced by the *validation des acquis de l'expérienc*e, or VAE) allowed workers to obtain credit toward a vocational diploma through on-the-job experience. As with other aspects of education and training programmes, to be effective, these qualifications must be designed with industry input to reflect skills demanded by firms.

By incorporating qualifications frameworks and standardised assessments, VET can provide transparency, recognition for skills gained informally, and increase the value of training schemes by providing signals to prospective employers. Finally, where demand for VET is low because it is perceived as low status, schemes may need to be championed. To promote them, governments may reform policy accordingly and take measures to encourage the development of mindsets that value applied education and all fields of work.

Energy efficiency as a facet of competitiveness

Efficiency in the use of energy and its effects on carbon emissions are important components of traditional competitiveness and of a broader understanding of competitiveness that considers the negative externalities of production. Manufacturing that is heavily dependent on energy is vulnerable to fluctuations in energy prices and to changes in regulations and consumer preferences that punish polluters. Apparently high productivity gained through the use of subsidised energy does not accurately represent competitiveness. Similarly, considering only within-firm efficiency and ignoring issues such as pollution ignores social costs to the environment, to health and general welfare, and to the economy. Productivity and efficiency measures that do not control for energy use and emissions obscure those important facets of developing a competitive economy.

Energy-intensive manufacturing in developing countries stems from relatively greater share of high energy consuming activities in the economy and from low energy efficiency across all industries. To improve energy efficiency, companies need financing to invest in clean technologies and effective governance which entails phasing out any production subsidies for energy. While the increased use of renewable energy is not associated with higher productivity levels, it appears that high-technology producers and larger firms may be more competitive when measured against traditional and environmental yardsticks.

Emerging economies are more specialised in energy-intensive manufacturing

Shifting wealth and the expansion of manufacturing in more energy-intensive emerging economies have led to considerable increases in manufacturers' energy consumption outside the OECD, though many of these are reducing their energy intensity at the same time (Figure 3.19). Although the amount of energy used per thousand 2002 USD in manufacturing value added remains above the OECD average in the Russian Federation, India, South Africa and China, these countries have reduced energy intensity in recent years. The improvements in China have been particularly large; between 2000 and 2007, energy intensity declined by 57%. Energy use continued to increase in Indonesia, Brazil and Morocco, however.

Higher energy use in industrialising economies is to be expected, as development is typically accompanied by electrification, the rapid expansion of energy infrastructure, and the growth of energy-intensive industries (Sahu and Narayanan, 2011). This trend can be reversed, however. The environmental Kuznets curve hypothesis suggests that, starting from a low level of development, environmental degradation increases with a country's income. It then eases as growing wealth allows economies to restructure towards less energy-intensive activities or as technological developments improve efficiency in general and energy efficiency in particular.

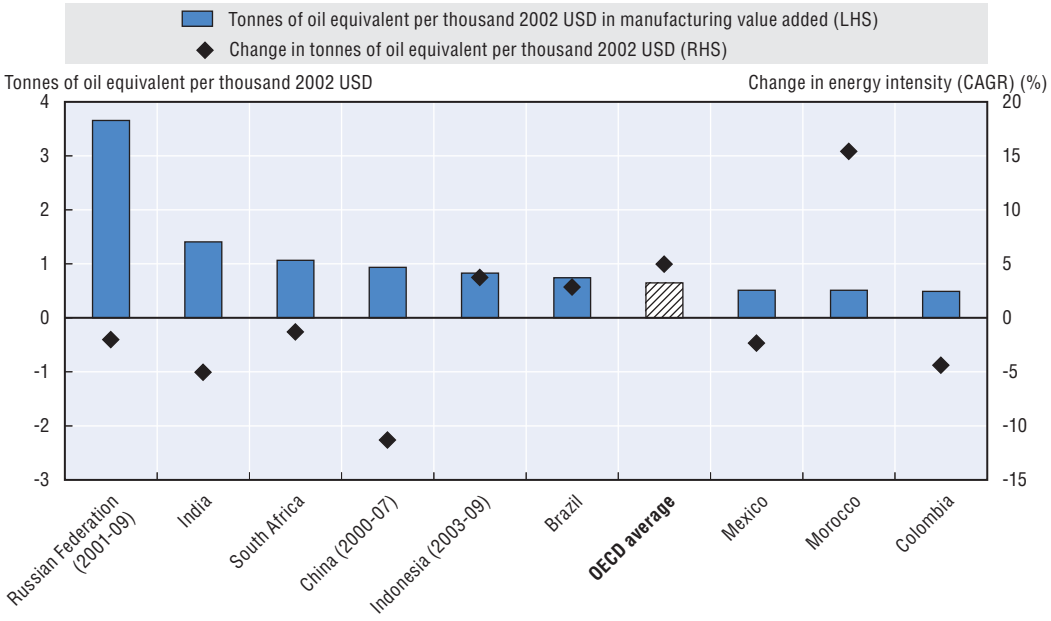
Firms can improve both energy efficiency and productivity

Although the structure of manufacturing sectors can play a large role in determining energy intensity, industry effects are also considerable and can be lessened through responses that improve market competitiveness. Technological growth often reduces input requirements, which include energy. Economies of scale and age effects related to experience and vintage capital may also exist in energy use.

In addition to the use of more productive, energy-efficient technologies and processes, market competitiveness and energy use may both be affected by firm characteristics. In both China and Indonesia, two countries for which data on energy use were available, business with between 20 and 49 employees were the least energy efficient (Figure 3.20). Economies of scale in energy use are likely to operate through similar channels as productivity

Figure 3.19. **China and other emerging economies are improving manufacturing energy efficiency**

Tonnes of oil equivalent used per thousand 2002 USD value added in selected manufacturing industries and compound average annual growth in energy intensity, 2000-09



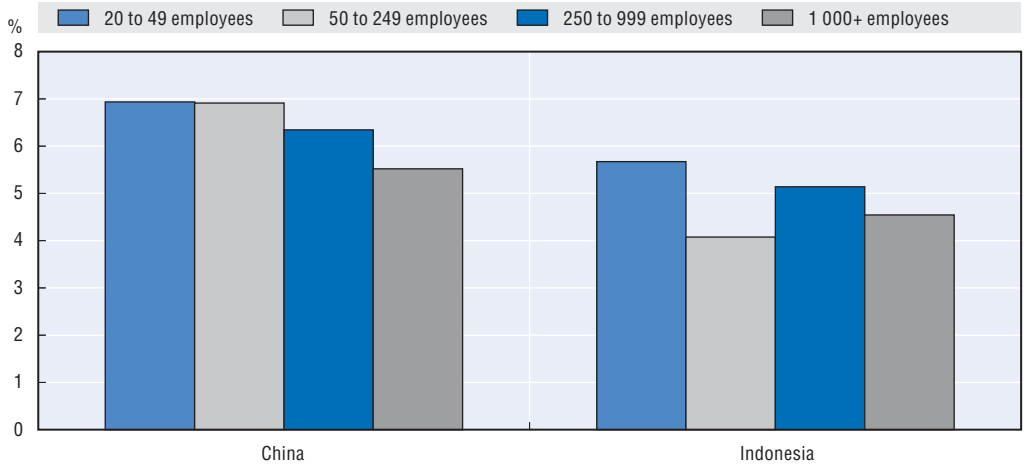
Notes: Due to data limitations and for the sake of comparability, manufacturing averages are calculated from the following industries (ISIC Rev.3): 15-19, 21-24, 26 and 27. The OECD average includes member countries from 2009, except for Korea and the Slovak republic, for which comparable data was not available.

Sources: Authors' calculations, using IEA (2012), *World Energy Statistics and Balances* (database), International Energy Agency; UNIDO (2013), *INDSTAT4: Industrial Statistics Database* (database), United Nations Industrial Development Organisation.

StatLink http://dx.doi.org/10.1787/888933058217

Figure 3.20. **Energy intensity is higher among smaller manufacturers**

Average energy expense as a share of firm output, 2008



Note: Of the nine countries studied in detail, information on energy use by firm was only available for China and Indonesia.

Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058236

scale effects. Bigger firms may be able to spread their plants' fixed energy costs over large volumes of production, or larger operations may be able to use specialised equipment that lowers energy requirements along with those for other inputs. The relationship between age and energy efficiency seems less clear, however. Older firms tend to show lower energy intensity in China and no obvious pattern emerges in Indonesia. It is possible that the beneficial effects of experience in some older firms are outweighed by their use of older, less energy-efficient machinery and equipment. Energy efficiency is also likely to be affected by additional company-related factors, such as management and workers' skills and knowledge.

Technological upgrading can also improve both productivity and energy efficiency. Newer, cleaner technologies make it possible to use less energy and make production more environmentally friendly. The potential gains may be huge, especially in emerging countries that rely heavily on energy-intensive industries. In addition to upgrading technologies, improvements in production processes to enable energy recovery also increase energy efficiency at industry level. Innovation and investment are needed, however. The relative difficulty of accessing finance for energy efficiency projects in emerging economies may be eased by reassuring investors or by putting in public-private partnerships to lower risk for private investors.

Well designed, properly enforced energy and environmental regulations and standard measures and benchmarks for energy consumption and efficiency at industry level may also create incentives for firms to optimise their energy usage. Standards allow firms to compare their own levels of energy consumption against those of their peers or the industry average. These are commonly used tools in industrialised counties, and some emerging economies have also taken steps in the same direction. The Indian Bureau of Energy Efficiency (BEE) has implemented benchmarking programmes in several industries (cement, pulp and paper, textiles, aluminium, fertiliser, chlor-alkali, etc.) by conducting energy audits, identifying best practices, and developing energy consumption norms (Sathaye et al., 2005). Firms are encouraged to participate by sharing information about best practices, declaring voluntary targets, and adopting benchmarks for their processes. Where such measures are not sufficient in themselves, more forceful regulations that require standards to be met may be called for.

As for energy subsidies, companies may have trouble adapting to business without them. However, scrapping them is beneficial for both their long-term competitiveness and their energy efficiency (Box 3.6).

Box 3.6. **The gradual removal of energy subsidies helps improve efficiency**

The strong presence of fossil-fuel subsidies in emerging countries may create distortive price signals and result in higher energy consumption or production, or barriers to entry for cleaner energy services (OECD, OPEC, World Bank, 2010). The result is relatively lower energy efficiency. Production subsidies can promote the consumption of one type of fuel over another by reducing the cost of the input for energy service providers. In that case, production subsidies can create inefficient production paths. Fossil-fuel subsidies also keep fossil fuels artificially attractive and reduce incentives to invest in clean energy and energy efficiency. The consequence of this artificial competitive advantage granted to conventional energy by fossil-fuel subsidies is that encouraging clean energy technologies becomes costly, as extensive support is required to put them on a competitive footing. Removing fossil-fuel subsidies could thus simultaneously boost the competitiveness of clean-energy technologies and improve countries' fiscal balances, freeing up resources to invest in energy efficiency (OECD, 2013b).

Box 3.6. **The gradual removal of energy subsidies helps improve efficiency** *(cont.)*

Although phasing out energy subsidies has a positive impact on energy efficiency, it may hamper industries' competitiveness. Governments should therefore combine phasing out with measures to support the affected companies, communicate extensively, and be entirely transparent. The decision to phase out fossil-fuel subsidies requires an efficiency assessment – to determine whether the energy subsidy policy tool meets its intended objective. Several questions should be assessed in addition to the efficiency of the subsidy: how the subsidy affects the consumption of households and industry, and whether it can be effectively replaced by more cost-effective policy tools.

Once governments have identified which subsidies to reform, they should devise mechanisms to overcome resistance. Adversely affected stakeholders may well be poor households, as consumption subsidies are often designed to alleviate poverty. And even though energy consumption subsidies may not be the most effective way of assisting poor households, they will still be the worst affected by the phase-out (Coady et al., 2006).

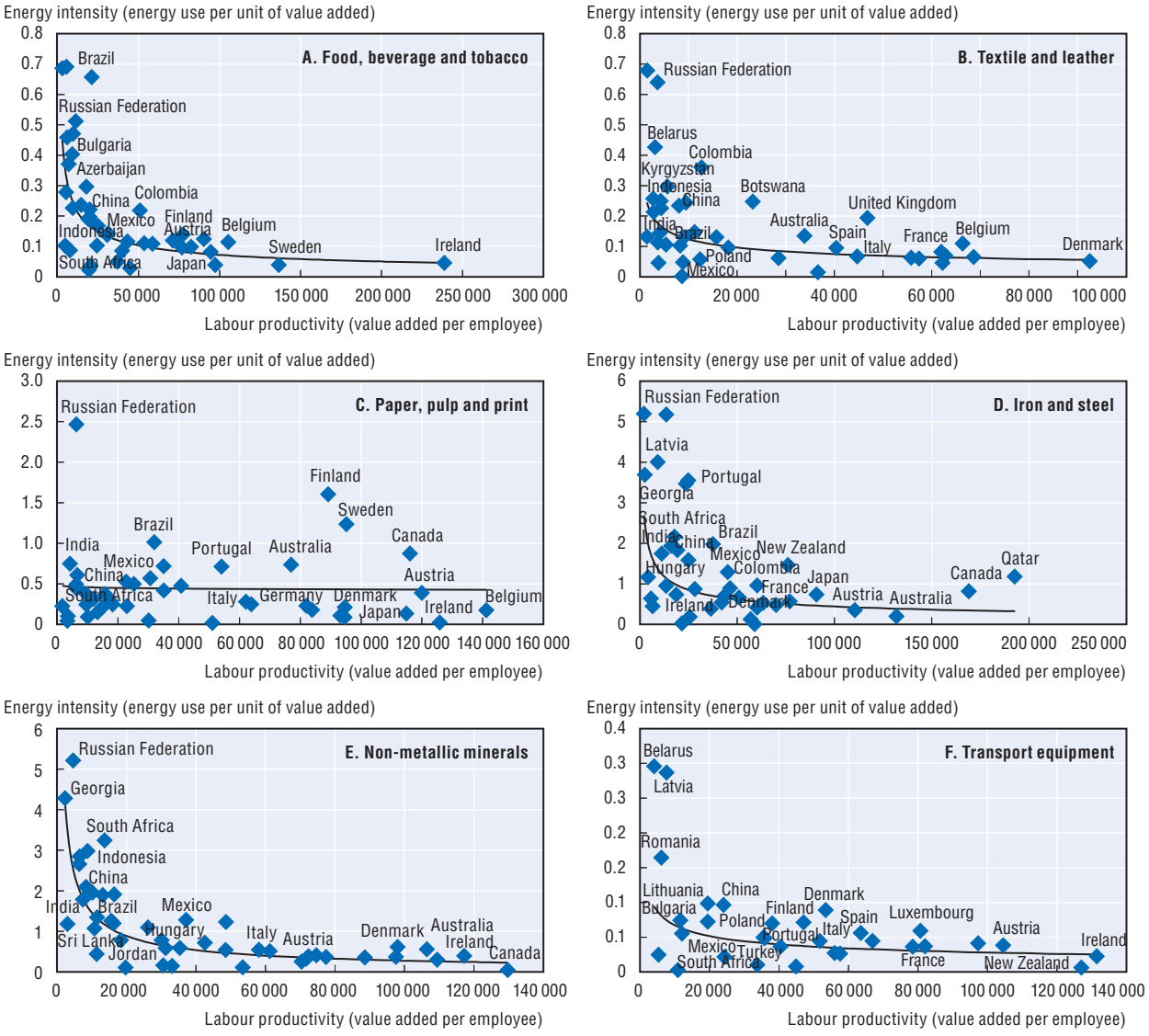
Resistance may also come from industries whose competitiveness has suffered. Coping with discontent involves identifying affected groups, informing them in a timely, transparent information manner about the impacts of the reform, and providing economic compensation, if applicable, to help firms adjust. In this respect, governments may wish to provide affected firms with temporary, targeted assistance to help them restructure, adopt new technologies, or exit the industry. Germany's and Poland's coal subsidy reforms in the 1990s incorporated social assistance packages to ease distress caused by the closure of mines. The United Kingdom, however, did little to help affected regions when it scaled down its mining industry in the mid-1980s, which led to high unemployment. The British government finally provided some assistance in 2000 in the shape of financial support to allow remaining firms to exploit alternative economic opportunities in coal-mining areas. Indeed, beyond the immediate aim of temporary support to affected industries, freed-up public resources can be used to stimulate more growth-accelerating investment and support renewable sources of energy.

In many manufacturing industries, there tends to be an inverse relationship between countries' labour productivity and energy intensity levels (Figure 3.21). The trend is particularly marked in sectors such as food, beverages and tobacco; iron and steel and non-metallic minerals, while there is no such relationship in the paper, pulp and print industry. Countries where productivity is high and energy intensity low are typically wealthy OECD countries. The association between low energy intensity and high labour productivity can be linked to the use of new technologies in advanced economies, which yield high labour productivity and low levels of pollution. Conversely, low energy efficiency and low productivity are the mark of small-scale manufacturing plants that use outdated processes. Emerging countries should introduce policies that promote new technologies and processes in industry as part of an effort to combine environmental concerns with market objectives.

For other sectors, such as paper or wood manufacture, energy intensity's correlation with productivity appears less significant; even countries with relatively low labour productivity produce at low energy intensity. There may not be a relationship between productivity and energy use because productivity-enhancing technologies used in these industries do not significantly affect energy consumption, or because labour and energy are better substitutes in these fields of manufacturing. In the Indian pulp and paper industry, producers were able to substitute labour for energy, resulting in low energy intensities and low labour productivity (Sahu and Narayanan, 2010).

Figure 3.21. **High energy intensity is often associated with low labour productivity**

Labour productivity and energy intensity in manufacturing, 2009



Notes: All manufacturing sectors except rubber, plastic products, furniture, and recycling. Data for China are from 2007. Labour productivity is calculated in terms of value added in 2002 USD per employee and energy intensity in terms of energy use in tonne of oil equivalent (toe) per unit of value added in thousands 2002 USD.

Sources: Authors' calculations, using IEA (2012), *World Energy Statistics and Balances* (database), International Energy Agency; UNIDO (2013), *INDSTAT4: Industrial Statistics Database* (database), United Nations Industrial Development Organisation.

StatLink http://dx.doi.org/10.1787/888933058255

While energy efficiency and productivity go together, renewable energies are not associated with higher labour productivity, at least at the aggregate level. The reason why they are actually associated with low productivity in manufacturing could be that they are more labour intensive than traditional fuel-based fuels (Martinez-Fernandez et al., 2010). Policies to promote the use of renewable energies seek to compensate for the low internalisation of environmental externalities such as pollution and carbon emissions and to offset any productivity loss caused by the use of renewables. Such policies should, however, be limited in time and gradually phase out assistance. To be effective they should first address barriers to acceptance such as the lack of information and training in

renewable energies. Second, in order to secure investors, policies should provide a predictable, transparent support framework. However, there are grounds for arguing that programmes to further the use of renewables should be designed as tools to monitor the cost-effective transition to the large-scale market integration of renewable energies.

The relationship between green energies and productivity highlights possible contradictions between environmentally inclusive and market-oriented views of competitiveness. Demand for greener products and emissions controls do not seem to have been effective in forcing firms to internalise the social costs of carbon-intensive production. Emerging country governments should, where feasible, keep up their efforts to harmonise productivity and emissions intensity by altering demand and promoting technological development that makes reductions in energy intensity cost effective.

Key considerations to boost competitiveness of manufacturing industries

Diversification and improved competitiveness in manufacturing help ensure competitiveness and continuous economic growth. To that end, businesses require supportive environments to contribute to productivity growth. Improvements in manufacturing competitiveness are shaped by factors external and internal to existing, exiting and entering firms. Domestic liberalisation and openness to international markets helps achieve these goals, though firms may need targeted government assistance in taking advantage of these opportunities and seeing reasonable returns on their investments and innovation. It is also important that competitiveness not be improved through inefficient energy use and the creation of excessive negative externalities, such as pollution. Central challenges for policy makers will be to prioritise competitiveness-related options and balance seemingly contradictory goals, like encouraging innovation and supporting its diffusion. The following areas can be considered for developing strategies to improve competitiveness of firms:

- Competition often breeds competitiveness: large and internationally open industries are able to lower costs, improve quality, and benefit from knowledge flows about innovative products and processes. Where widespread liberalisation is impractical, SEZs may be a useful alternative if spillovers through deep connections to the local economy can be fostered. Low administrative barriers to entry and flexibility in input use help to create positive business environments. Imports and FDI also improve competition and access to international knowledge and technology. Administrative barriers to firm entry should be kept low to encourage firm entry, which can be an important source of competitive pressure and productivity growth.
- It may be necessary to limit market power or prevent the emergence of very high levels of competition that can discourage innovation and constrain firm competitiveness. A further requirement is policy strategies to facilitate spillovers between firms and help develop the domestic capacity to maximise the indirect benefits of FDI.
- Large firms tend to be more productive. Rather than providing support for small firms that actually discourages their expansion, policy makers should encourage businesses to grow. Policies that favour small firms and introduce significant threshold effects should be reformed to gradually reduce preferential treatment as firms grow. Over-reliance on incentives that favour large firms should also be avoided, as they may exclude growing firms. However, smaller competitors may be highly competitive producers that can benefit from participation in global value chains. Government assistance with financing and in providing basic services can help such producers to overcome their size-related disadvantages. Credit guarantees for smaller firms may also help these firms to remain flexible and innovative, and allow for the expansion of those with growth potential.

Key considerations to boost competitiveness of manufacturing industries *(cont.)*

- Firms that innovate and make use of basic research are likely to be more competitive. Support for public R&D and financial assistance to encourage firm-level innovation may be beneficial. Worker training and education is associated with firm productivity and complements technological growth. Education programmes should be designed to meet firms' expected needs and considered a component of technological upgrading.
- Productive firms that move into export expand their markets and there may be significant productivity gains from an increase in the number of firms that export. Assistance in lowering export costs through the provision of supportive shared services like trade missions and export credit can help encourage exporting activities, particularly among smaller firms.
- Technological improvement and economies of scale appear to have important impacts on energy efficiency and firm productivity. Incentives for innovation, improved regulation and the gradual removal of energy subsidies may encourage the development of more environmentally-friendly productive manufacturing.

References

Acemoglu, D. and D. Cao (2010), "Innovation by entrants and incumbents", *National Bureau of Economic Research Working Paper*, Cambridge.

Aghion P., M. Braun and J. Fedderke (2008), "Competition and productivity growth in South Africa", *Economics of Transition, Vol. 16, No.* 4, pp. 741-768.

Bahk, B.H. and M. Gort (1993), "Decomposing learning by doing in new plants", *Journal of Political Economy, Vol. 101*, pp. 561-583, The University of Chicago Press.

Baldwin, J., J. Maynard, D. Sabourin and D. Zietsma (2001), "Differences in interprovincial productivity levels", *Statistics Canada Research Paper Series, No. 180*, December.

Bartelsman, E.J., J. Haltiwanger and S. Scarpetta (2004), "Microeconomic evidence of creative destruction in industrial and developing countries", *Institute for the Study of Labour, Discussion Paper Series, No. 1374*.

Bernard, A., S. Redding and P. Schott (2011), "Multiproduct firms and trade liberalization", *The Quarterly Journal of Economics*, Oxford University Press.

Carneiro, P. and J. Heckman (2003), "Human capital policy", *NBER Working Paper 9495*, Cambridge, *www.ucl.ac.uk/~uctppca/HCP.pdf*.

Chen, L. and S. Kitamura (2012), "SMEs, finance, and economic outcomes in Taiwan".

Coady, D., R. Gillingham, P. Medas and D. Newhouse (2006), "The magnitude and distribution of fuel subsidies: Evidence from Bolivia, Ghana, Jordan, Mali, and Sri Lanka", *IMF Working Paper*, International Monetary Fund, Washington, DC.

Eaton, J. and S. Kortum (2000), "Trade in capital goods", *NBER Working Paper* 8070, Cambridge, *http://home.uchicago.edu/~kortum/papers/capg21.pdf*.

Eslava, M., J. Hattiwanger, A. Kugler and M. Kugler (2004), "The Effects of Structural Reforms on Productivity and Profitability Enhancing Reallocation: Evidence from Columbia", *Journal of Development Economics*, Vol. 75, No. 2, pp. 333-371.

Fan C.S. and Y. Hu (2008), "Imports of capital goods and enterprise performance: a firm-level analysis in China", *Applied Economics Letters, Vol. 15, No.* 5.

Foster, L., J. Haltiwanger and C.J. Krizan (1998), "Aggregate productivity growth: Lessons from microeconomic evidence", *NBER Working Paper No. 6803*, November.

Goldberg, P., A. Khandelwal, N. Pavcnik and P. Topalova. (2012), "Multiproduct firms and product turnover in the developing world: evidence from India", *The Review of Economics and Statistics, Vol. 92, No.* 4, pp. 1042-1049.

Griliches, Z. (1957), "Specification bias in estimates of production functions", *Journal of Farm Economics*, Vol. 39, No. 1, Oxford University Press.

Halpern. L., M. Koren and A. Szeidl (2011), "Imported inputs and productivity", memo, University of California Berkley, *http://emlab.berkeley.edu/~szeidl/papers/imports_productivity.pdf*.

IEA (2012), *World Energy Statistics and Balances* (database), International Energy Agency.

IEA (2008), *Deploying renewables: Principles for effective policies*, International Energy Agency, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264042216-en*.

IMF (2012), "People's Republic of China, 2012 Article IV Consultation", *IMF Country Report No. 12/195*, International Monetary Fund, July.

Martinez-Fernandez, C., C. Hinojosa and G. Miranda (2010), "Greening Jobs and Skills: Labour Market Implications of Addressing Climate Change", OECD Local Economic and Employment Development (LEED) Working Papers, No. 2010/02, OECD Publishing, *http://dx.doi.org/10.1787/5kmbjgl8sd0r-en*.

Melitz, M.J. (2003), "The impact of trade on intra-industry reallocations and aggregate industry productivity", *Econometrica, Vol. 71, No. 71*, pp. 1695-1725.

OECD (2013a), *FDI Regulatory Restrictiveness Index*, OECD, Paris, *www.oecd.org/investment/fdiindex.htm*.

OECD (2013b), *Policy Guidance for Investment in Clean Energy Infrastructure*, report submitted to the G20 with inputs from the World Bank and UNDP, *www.oecd.org/daf/inv/investment-policy/CleanEnergyInfrastructure.pdf*.

OECD (2011), *OECD Economic Outlook*, Vol. 2011/1, OECD Publishing, Paris.

OECD (2010), *Learning for Jobs*, OECD Publishing, Paris.

OECD, OPEC, World Bank (2010), "Analysis of the scope of energy subsidies and suggestions for the G-20 initiative", OECD Publishing, Paris.

Oliveira-Martins, J., S. Scarpetta and P. Dirk (1996), "Mark-up ratios in manufacturing industries: Estimates for 14 OECD countries", *OECD Working Paper No. 162*.

Roeger, W. (1995), "Can imperfect competition explain the difference between primal and dual productivity measures? Estimates for US manufacturing", *Journal of Political Economy, Vol. 103, No. 2*, pp. 316-330.

Sahu S. and K. Narayanan (2011), "Determinants of energy intensity in Indian manufacturing industries: A firm level analysis", *Eurasian Journal of Business and Economics, Vol. 4, No. 8*, pp. 13-30.

Sahu, S. and K. Narayanan (2010), "Labour and energy intensity: A study of pulp & paper industries in India", paper presented during the Joint Annual Conference of IASSI & Knowledge Forum at IIT Bombay.

Sakllaris, P. and D. J. Wilson (2000), "Quantifying embodied technological change", *Review of Economic Dynamics, Vol. 7, No. 1*, pp. 1-26.

Sathaye, J., L. Price, S. de la Rue du Can and D. Fridley (2005), *Assessment of energy use and energy saving potential in selected industrial sectors in India*, Lawrence Berkeley National Laboratory, Berkeley.

Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper Number 10*, *www.wiod.org/publications/papers/wiod10.pdf*.

UNIDO (2013), *INDSTAT4: Industrial Statistics Database* (database), United Nations Industrial Development Organisation.

World Bank (2013a), *Enterprise Surveys* (database), World Bank, Washington, DC. *http://data.worldbank.org/data-catalog/enterprise-surveys*.

World Bank (2013b), *Doing Business Survey*, World Bank, Washington, DC.

ANNEX 3.A1

Methodological notes

Estimation of total factor productivity

Total factor productivity (TFP) at the firm level was estimated using survey data from manufacturing sectors and other industries in Brazil, Cameroon, China, Colombia, India, the Russian Federation, Senegal, and South Africa for all available years.

Outlying observations were identified through a preliminary simple ordinary least squares (OLS) regression of firm output by employment, productive capital and intermediate goods, and year dummies, run separately by country and industry. Observations with DfBeta results above $\frac{2}{\sqrt{n}}$ were excluded from the TFP estimations.

With the assumption of country- and industry-specific production functions, firm- and year-specific TFP was estimated using a fixed-effects model of firm output for each country and industry (two-digit ISIC Rev.3.1 categories), controlling for firm employment, productive capital, and intermediate goods used in production. Dummies of year variables were included to improve the estimates of factor coefficients by controlling for annual changes, such as changes in demand.

Industry estimates were accepted as valid and used to calculate firm TFP if, among the estimated coefficients for employment, capital and intermediates, no variables were omitted, no negative coefficients were significant at the 90% level, and at least two of the three variables were significant at the 90% level or above. TFP results from non-valid industry regressions were not used. Valid results were weighted by firm shares of output by industry or other categories to produce measures of average TFP.

Estimation of mark-ups

A departure from the standard assumptions of the neoclassical production theory allows for the assumption of monopolistic firms charging mark-ups over marginal costs. To implement such an approach, the production technology is assumed to be defined by the neoclassical production function:

$$Y = AF(N,K) \qquad (1)$$

where Y is output, A is multifactor productivity growth, there are two inputs: N is labour, and K is capital and $F(.)$ is a homogenous function of degree λ (the degree of returns to scale). The firm and year subscripts are subtracted for the sake of simplicity. After log-differentiation[1] and re-arranging:

$$SR_{primal} = y - \alpha_N n - (1-\alpha_N)k = (1-B)a - B(y-k) \qquad (2)$$

where SR_{primal} is the primal Solow residual, the lower case indicates log-differentiation, α_i is the revenue share of factor i and B is the Lerner index, which is closely related to the mark-up μ:

$$B = 1 - \frac{1}{\mu} \qquad (3)$$

Estimation of equation (2) would lead to biased results as the explanatory variables are correlated with the productivity shock a. To overcome the endogeneity issues, the dual or priced-based Solow residual is derived by using the cost-function associated with the production function in equation (1).

Oliveira Martins et al. (1996) show that the equation to estimate the mark-up can also be derived from the direct definition of the mark-up over average cost:

$$SR_{dual} = \alpha_N w + (1-\alpha_N)r - p = (1-B)a - B(p-r) \qquad (4)$$

where w is the growth rate of wages, r is of the rental price of capital and p is of output. By subtracting (4) from (2) and adding an error term, B can be estimated as Roeger (1995) showed. As the unobservable productivity term, a cancels out with this subtraction, this equation is relatively easy to estimate.

$$\frac{P}{AC} = \frac{P \times Y}{(W \times N + R \times K)} = \frac{\mu}{\lambda} \qquad (5)$$

where AC is average cost, P, W, and R are the prices of output, labour and capital, respectively, whereas λ is an index of returns to scale (i.e. average costs over marginal costs) and μ is the mark-up.

After differentiation and under the assumption of constant returns to scale ($\lambda = 1$) the equation to estimate (after adding an error term) is obtained:

$$(p+y) - \alpha_N (w+n) - (1-\alpha_N)(r+k) = B[(p+y) - (k+r)] \qquad (6)$$

where the first term in the left-hand side is nominal output, the second is wage cost multiplied by the estimated coefficient on labour α_N from the production function, and the third is the rental price of capital multiplied by the estimated coefficient on capital ($1 - \alpha_N$), all in differences. The totality of the left-hand side is the Solow residual with variables measured in nominal terms. In the right hand-side, B is the Lerner Index ([price-average cost]/price) to be estimated.

Industry mark-up estimates were accepted as valid if, from the first stage regression, among the estimated coefficients for employment, capital and intermediates, no variables were omitted, no negative coefficients were significant at the 90% level and at least two of the three variables were significant at the 90% level or above.

Estimation of technical efficiency

Technical efficiency was estimated at the firm level using data envelopment analysis (DEA), which identifies a production frontier of firms make the most efficient use of multiple inputs to produce one or more output goals. The relative efficiency of firms not operating at the frontier is measured in terms of their distance from this standard.

Using the datasets produced in preparation of the TFP estimations, outliers identified in the preliminary simple OLS regression were removed, as were observations missing the required variables. To accommodate software limitations, random samples of 200 observations were taken from the valid observations available for each country and sector. For countries with fewer than 200 valid observations available in the given sector and year, all available firms were selected, as long as at least 20 valid observations were available.

Separate estimations were run for each industry (two-digit ISIC Rev. 3.1 categories), across the selected observations from all countries. The factors of production used in TFP estimations – wage costs (calculated using firm employment and industry average wages for Russia, Brazil and Senegal, due to data availability), productive capital multiplied by the national rental price of capital and intermediate goods – were used as inputs in maximising two outputs: total firm output and firm profits (approximated as value added minus wage costs). All values were taken from 2007 data, except for those from South Africa, where 2008 was the closest year available.

Company theta scores, measuring one minus the relative distance the firm to the production frontier, were aggregated by country by weighting firms' shares of output among selected observations in their country.

ANNEX 3.A2

Additional tables

Table 3.A2.1. **Labour productivity growth rates, by industry**

StatLink http://dx.doi.org/10.1787/888933080124

Table 3.A2.2. **Total factor productivity (TFP) growth rates, by industry**

StatLink http://dx.doi.org/10.1787/888933080143

Table 3.A2.3. **Mark-up estimates, by industry**

StatLink http://dx.doi.org/10.1787/888933080162

Table 3.A2.4. **Technical efficiency in manufacturing, 2007**

StatLink http://dx.doi.org/10.1787/888933080181

Perspectives on Global Development 2014
Boosting Productivity to Meet the Middle-Income Challenge

Chapter 4

Competitiveness in and through services

Fostering the development of competitive service sectors has great potential to enhance overall competitiveness and to contribute to the convergence process in middle-income countries. They can help create jobs and – with their relatively low resource intensity – drive inclusive, sustainable development. Rapid progress in ICT has allowed economies of scale in the production of most services and spillover effects to be realised. The first section endeavours in particular to show that services can contribute to the movement towards convergence in that they help increase consumption, complement manufacturing, and are increasingly tradeable. Sustained competitiveness in services can be achieved only through higher productivity and efficiency. The second section of this chapter shows that while emerging countries' productivity levels in some services are still considerably lower than those of the advanced economies, they are catching up. The third section identifies policy options to develop competitive service sectors.

1. Note by Turkey:
The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Boosting productivity and efficiency in service industries has great potential as a way to enhance overall economic competitiveness, particularly in developing countries where services are generally less well developed. They can help create jobs and – with their relatively low resource intensity – drive inclusive, sustainable development.

To avert or lessen any risk of slipping into a sustained slowdown of growth, countries should, from an early stage of their economic development, work towards the time when the competitive advantages of their firms springs from productivity and efficiency rather than from low production costs, monopoly power, or selective state subsidies. This chapter focuses on policies that seek to improve the productivity and efficiency of the service industries.

The first section discusses whether latecomers to economic development may skip profound industrialisation – the building of high value-added manufacturing sectors – and focus directly on high-end services. It endeavours in particular to show that services can contribute to the movement towards convergence in that they help increase consumption, complement manufacturing, and are increasingly tradeable.

As in manufacturing, sustained competitiveness in services can be achieved only through higher productivity and efficiency. The second section of this chapter shows that while emerging countries' productivity levels in some services are still considerably lower than those of the advanced economies, they are catching up. Moreover, productivity and growth in the services sector is often higher than in manufacturing, which points to its potential as an engine of growth.

Building on stylised facts from productivity differences between sectors and countries, the last section investigates the factors contributing to firms' relative competitiveness within and across sectors as well as across countries. It devotes particular attention to the role of modern (ICT) infrastructure, contract enforcement, intellectual property protection, appropriate skills, and competitive pressure (which includes openness to international investment and trade). The section also explores relevant policy options.

Convergence through services

Services and goods have traditionally different characteristics. Goods can be traded internationally and produced anywhere at any time on any scale. Rising world demand allows firms to boost productivity by specialising in goods and skills and increasing their scale of operation, which generally reduces per unit production costs. In his second law, Kaldor (1967) argued that increasing returns to scale lead to a positive association between productivity and growth in the manufacturing sector, making it the primary engine of growth.

By contrast, services were long bound by time and place, almost always requiring face-to-face interaction and transactions. Getting a haircut, eating in a restaurant, having a medical check-up, or seeking a loan from a bank are just a few examples of such traditional personal services. Furthermore, as Baumol (1967) argued, labour is a more essential element of production in traditional services than in goods, so leaving less scope for substituting labour input. As a result, traditional services' slower productivity growth,

combined with wage increases that must match those in the goods sector, lead to faster-paced rises in their nominal costs. Traditional services' mounting share of GDP and the consequently slower rate of overall productivity gains – known as "Baumol's cost disease" – have long been a key concern for middle- and high-income countries.

The fundamental distinction between manufactured goods' and traditional services' respectively high and low productivity growth potentials is responsible for economists' and policy makers' longstanding, exclusive focus on how to industrialise and ultimately sustain a large manufacturing sector. Until recently, services were almost completely disregarded by policy and research interested in improving productivity and growth potential (Flaaen et al., 2013).

ICT revolution enables productivity growth in services

The advent of information and communication technology (ICT) revolutionised the services sector. It accelerated what Bhagwati (1984) called their "splintering and disembodiment", making many tradeable and radical productivity gains possible. Service sectors with the highest potential for productivity increases were those Baumol (1985) dubbed "modern impersonal progressive services". They include telecommunications, financial services, and business-related services such as data processing and the online distribution of electronic content.

The common drivers of the services revolution are what Ghani (2010) calls the "3Ts" – technology, transportability, and tradability.

1. Technology. ICT in particular has made services storable. For example, it is now possible to conduct banking and insurance transactions online – often without face-to-face interaction with a banker – and then to store them, much as if they were physical services.
2. Transportability. The Internet and telephone lines transport services at high speed over long distances with little or no effect on quality. A person sitting in a far-away office can now, for example, provide a consultancy service at very low transaction costs.
3. Tradability. Many services can be traded (mostly digitally) across countries with relatively low regulatory barriers – even though behind-the-border regulations may restrict the free exchange of services (Molnar, 2008; Molnar et al., 2008).

While there is still cross-border trade in only a small, albeit growing, share of ICT-enabled services (Ghani and Kharas, 2010), the 3Ts may actually lend themselves to productivity gains in traditional services – like education or healthcare – which so far required personal interaction between recipient (e.g. student or patient) and supplier (teacher or doctor) and could therefore not be traded.

In education, distance and e-learning – which can reach more students at a lower cost – are becoming common practice. They hold a particular appeal for developing countries where long distances often restrict schooling (OECD, 2013), although poor access to electricity and the Internet – e-learning prerequisites – often prevent them from reaping the benefits (Andersson and Groenlund, 2009). Similarly, new ICT-based models may work in the healthcare sector when patients do not have to see doctors frequently. They may, for example, seek advice from healthcare workers at any time of the day through online messaging services, so sparing themselves visits to medical centres.

In principle, most services now boast the growth-enhancing properties (such as economies of scale and spillover effects) once considered intrinsic to manufacturing.

Indeed, the 3Ts allow economies of scale that are likely to surpass those of the manufacturing sector, the most obvious example being computer software which can be replicated indefinitely without additional costs.

The ICT revolution has also triggered backward and forward linkages and spillover effects between service providers and sectors and between the services and manufacturing that further increase the potential for productivity gains (see below for a discussion on services intensity in manufacturing). Clustering may actually be easier for service providers than for manufacturing companies as they need less space and cause no product shipping logjams. Service corridors – like Silicon Valley in the United States and Hyderabad in India – attract droves of firms and workers and thus benefit from externalities such as knowledge spillovers (Bosker and Garretsen, 2010). However, if service provider firms are to take full advantage of linkages with other businesses, high-quality telecommunications infrastructures need to be in place. Otherwise, the services sector may experience congestion comparable to the traffic jams that affect manufactured goods.

The 3Ts have ushered in a paradigm shift into the ability of services to drive overall economic growth in both developing and developed countries. They also raise the question of whether economic development latecomers need first to industrialise if they have a strong service base, particularly of ITC-enabled services that offer high productivity-growth potential.

Some services may emerge as growth engines in tandem with manufacturing

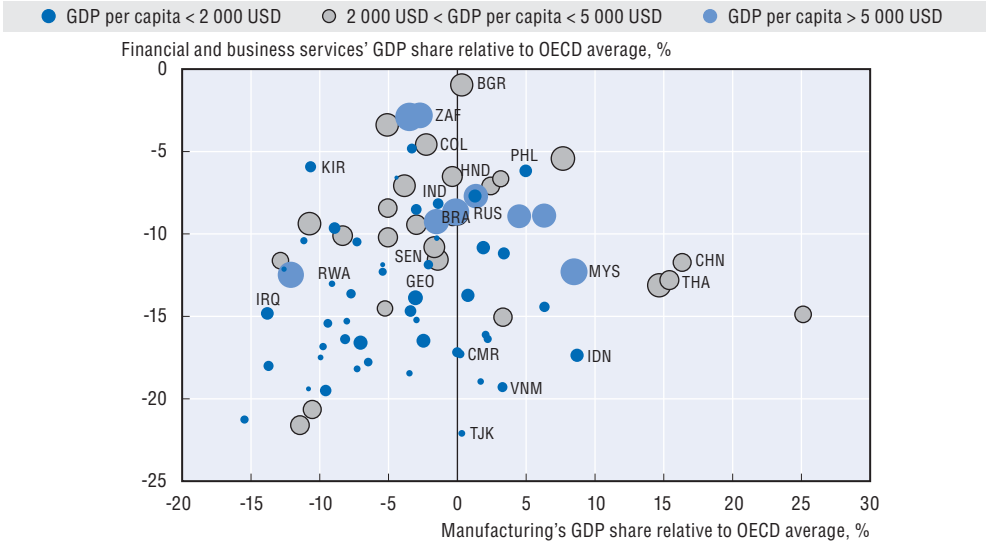
Benchmarked against the OECD, the GDPs of low- and middle-income countries show a below-average share of those services whose growth potential improved ICT infrastructure is mostly likely to unlock. Baumol (1985) identifies them as financial, business and telecommunications services. The available data does however not allow dismantling telecommunications from transport services and are therefore not included for the benchmarking against the OECD in this section. Financial and business services account for 24% of GDP on average across the OECD. The share of these services ranges from 4 percentage points below the OECD benchmark in Bulgaria to a 25-point shortfall in Tajikistan, where financial and business services make little or no contribution to GDP (Figure 4.1, y axis). Yet, in recent years the services sector has actually been the engine of Tajikistan's growth: between 2000 and 2010 it grew at an annual rate of 11% and its share of GDP leaped from 34% to 55%. Analysis indicates, however, that the dynamic was driven by traditional services rather than financial and business services where Baumol posits that sustained growth is most likely.

An interesting case is India. Although exports of ICT-enabled services, particularly business process outsourcing (BPO), have driven its growth momentum in recent years, the country lies a considerable 8 percentage points below the OECD average share of financial and business services in GDP. Similarly, the Philippines, which also boasts vibrant BPO activity, reports a gap of 6 percentage points. Emerging economies, such as the People's China, Malaysia and Thailand, that have relied more on a strong manufacturing base for growth show even wider differences – over 14 percentage points.

Such patterns suggest that low- and middle-income countries could significantly modernise their service industries by fostering services which offer a high potential for productivity gains and, by the same token, sustained growth. Nonetheless, middle-income countries are generally closer to the OECD benchmark than low-income ones, which points to greater structural convergence as they get richer, expand their financial and business service sectors, and are increasingly able to draw on them to power economic growth (denoted by the size of the coloured circles in Figure 4.1).

Figure 4.1. **High growth potential in financial and business services in all non-OECD countries**

Manufacturing's share of GDP in non-OECD countries versus financial and business services' share
Shares benchmarked against OECD average



Notes: The bubble size indicates a country's per capita GDP. Shares of GDP are based on the most recent data available for each country between 2006 and 2011. Country names are abbreviated by 3-digit ISO codes. Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Financial services correspond to financial intermediation (ISIC sector J) and business services to real estate, renting and business activities (ISIC sector K). Qualitatively, the figure looks similar when adding transport, storage and communications (ISIC sector I) to this group of services. That sector includes potentially growth-enhancing services such as telecommunications. In the OECD area, manufacturing's share of total value added is 16% and financial and business services' share is 24%. OECD's average GDP per capita level is just around USD 33 000. The OECD average excludes Israel, Korea and New Zealand.
Source: Authors' calculations based on UN (2013), *UN data* (database), *http://data.un.org/*.

StatLink http://dx.doi.org/10.1787/888933058274

How the share of financial and business services in GDP relates to that of manufacturing is ambiguous in developing countries. There appears to be no set of countries whose financial and business services compare relatively well to those of advanced economies, but whose industrial bases are significantly smaller (see the x axis in Figure 4.1). Nor does there appear to be evidence of clusters of middle-income countries, which have not first built a sizable manufacturing sector.

As a rule, poorer countries like Rwanda, Kyrgyzstan, and Georgia have manufacturing bases that are smaller than the OECD average, while the share of manufacturing in GDP of a number of emerging and middle-income economies, such as Brazil, Colombia, and the Russian Federation, is on a par with the OECD benchmark or higher, e.g. Argentina, China, and Thailand. India is another country where the manufacturing industry's share in GDP matches the OECD average. At first sight, the share may seem surprisingly high. It should, however, far exceed the OECD benchmark given India's level of income, much as the shares in Indonesia or China do. The finding is not, therefore, necessarily inconsistent with India (still) having a relatively poor manufacturing base.

Patterns are consistent with Kaldor's contention that manufacturing is the engine of growth – at least in the initial stages of development. In other words, higher shares of manufacturing in the developing world are associated with higher income levels. Bypassing industrialisation and directly (or only) focusing on services – which themselves have growth potential – has not (yet) proven a successful strategy for upgrading to

middle-income, let alone high-income, status. Even small, rich service economies like Singapore first industrialised comprehensively (Box 4.1).

Box 4.1. **Singapore, a leading service economy, went through profound industrialisation**

Singapore is a small economy with an estimated population of 5.4 million (2013) and an area that makes the city-state one of the smallest countries in the world. Nevertheless it has been a poster child of economic growth since its independence from Malaysia in 1965. Even then, its geographic situation had made its port a major hub for trade. On independence, however, it had a small domestic market and much of the population lived in poverty (IDE-JETRO and WTO, 2011).

Ever since the government established the Economic Development Board, it has pursued a strategy of export-led growth in combination with well-targeted, successful industrial and technology policies. On independence, Singapore implemented a strategy of openness and sought to attract foreign direct investment (FDI). It invested heavily in education to build a skilled workforce and in physical infrastructure to facilitate logistics. In the 50 years to 2010, the share of manufacturing in GDP increased from 11% in the 1960s to almost 30% in the 1990s. By 2010 it had slipped down to 23%, while the share of services had risen.

FDI helped not only to boost the economy directly, it also facilitated the transfer of technology and innovation, which provided leverage for further innovations. Continuous investment in infrastructure, logistics, the development of services, and education attracted FDI and enticed multinational corporations to stay (Lee et al., 2006).

When other Asian countries emerged as competitive manufacturers, the development of products related to existing ones helped to facilitate Singapore's gradual diversification into new, higher-technology products. The government reacted early and quickly to adjust to changing conditions, promoting structural change that incorporated technology upgrades and the development of services. Over the last decade, the focus of services has shifted from basic commercial activities to business and financial services, which today make up 27% of GDP (IMF, 2005, and Jankowska et al., 2012).

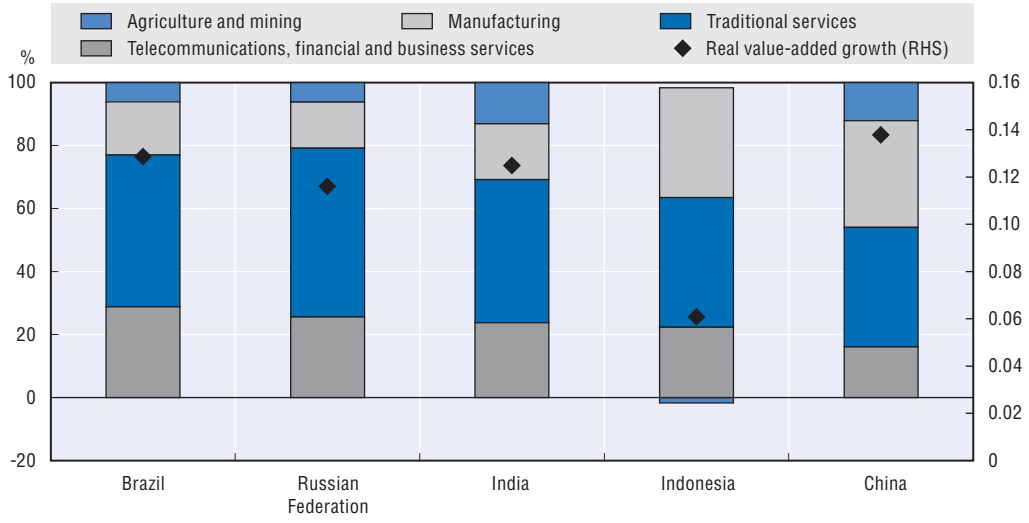
Nevertheless, challenges lie ahead. Other cities, especially in China, are exerting increasing economic pull and Singapore's ageing population will be an obstacle to any kind of growth strategy. The government is seeking to address those challenges through targeted migration strategies and priority investment in skills and education, especially adult learning (OECD, 2013). The aim is to support innovation and new sources of growth and enable Singaporean firms to seize emerging opportunities. Singapore is also supporting SMEs and their R&D capacities as part of a multi-agency assistance strategy to help local enterprises enhance their productivity.

Given the particular characteristics of Singapore, not all its strategies are transferable to any developing country. Nevertheless, it is a strong showcase for skills and education being a continuous advantage at all stages of development. Development policies are designed with clear vision and quantitative targets, while dedicated agencies ensure implementation and monitor results. High and continuously improving standards of education have helped to attract and maintain high levels of FDI, move the manufacturing sector up the product ladder, and sustain the recent shift towards more modern service activities. With the emergence of ICT-based services, the importance of the services sector for development has become even more pronounced. Nevertheless, the country's strong manufacturing base has been its growth base and its interaction with the service sector has delivered multiplier effects on economic growth.

Nevertheless, in addition to improving their manufacturing capacity, developing countries should harness the great potential of their competitive service sectors to enhance their overall economic competitiveness and move towards convergence. In fact, financial, business and telecommunications services (thought to have highest potential for sustained growth) jointly already contributed more to overall growth than manufacturing in recent years in three BRIIC countries, Brazil, India and the Russian Federation, though not China and Indonesia (Figure 4.2). This chapter mostly refers to the BRIIC rather than the BRIICS (including South Africa in addition), due to data limitations for South Africa.[1] Financial, business and telecommunications services' share in GDP were 24% in India, 26% in the Russian Federation, and 29% in Brazil, between 2003 and 2007 in contrast to manufacturing which contributed 18%, 15%, and 17%. In China and Indonesia, manufacturing remained a bigger engine of growth, accounting for over 30% of GDP compared to 16% and 23% for telecommunications, financial, and business services.

Figure 4.2. **Services drive over 50% of value-added growth in selected emerging economies**

Average sectoral contributions to real value-added growth between 2003 and 2007



Notes: Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Telecommunications, financial and business services encompass ISIC sectors 64, J and K. Traditional services include all other services, particularly the following ISIC sectors: the supply of electricity, gas and water (E), construction (F), wholesale and retail trade (G), hotels and restaurants (H), transport (60-63), public administration (L), education, health and social services (M, N and O). The analysis does not consider the activities of private households as employers of domestic staff or extra-territorial organisations and bodies (P and Q). Comparable data for South Africa was not available.

Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933058293

Interestingly, the biggest contribution to the strong growth between 2003 and 2007 comes from more traditional services sectors,[2] in which (at least in the near future) less productivity gains from the ICT revolution are expected. They accounted for over 35% of growth in all BRIIC countries. The strength of their input can probably be explained by the rise in the consumption of personal services (such as healthcare) as the five economies

transitioned towards middle-class consumption practices. While traditional services may also increasingly use ICTs to improve their productivity, patterns in their contribution to growth may be partly related to the Baumol Effect and should not be interpreted as those of a sustainable growth engine.

Developing tailored services to boost emerging middle-class consumption

Middle-income countries often successfully accumulate physical capital during the initial phases of their economic development. However, they may eventually be challenged by slower growth rates when they can no longer combine their investment-based strategies with low labour costs. Human capital accumulation then becomes an increasingly important factor in competitiveness on global markets.

Along with the changing situation on the supply side of the economy, the demand side also goes through significant adjustments during middle-income countries' development process. As poor workers swell the ranks of a growing middle-class society, consumption of and demand for variety in products and services will increase. China, for example, has grown enormously over the last two decades and emerged as one of the world's biggest exporters through heavy investment in infrastructure and the accumulation of physical and human capital in a wide range of manufacturing sectors. It is now home to an ever-rising middle class and, together with India, will account for most of the world's middle-class consumption by 2030 (OECD, 2010a).

Thus, besides improvements in productivity on the supply side to remain competitive in global markets, middle-income countries also need to make the transition towards more consumption-based economies. This involves, on one hand, identifying the emerging demands of domestic consumers and, on the other hand, producing the goods and services to meet those new demands. Making this transition will ensure middle-income countries a more sustainable and inclusive development path.

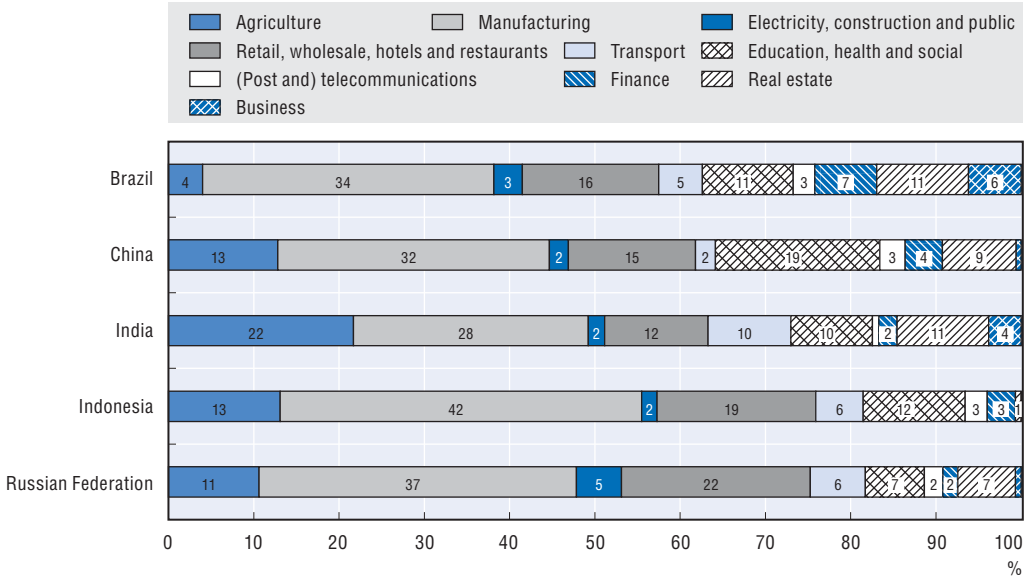
Given that consumer services generally show higher income elasticity than basic goods, their shares in value added are likely to increase when incomes and domestic demand rise (Flaaen et al., 2013). The result is new opportunities for business and innovative services tailored to consumers in middle-income countries. Policies that accelerate and facilitate innovation in the service industry include low entry and exit barriers for start-ups, streamlined administrative procedures for changing business structures, skills development schemes, the nurturing of creativity, and measures to attract venture capital firms. (For a more detailed discussion of how to create a market-friendly business environment conducive to innovative services, see below, "Building competitiveness-enhancing environment for services".)

Middle-income countries must meet new consumer demands – which include the demand for different services. The make-up of final household consumption in some emerging economies reveals that a wide diversity of services is consumed (Figure 4.3). Retail and wholesale services (including hotels and restaurants) were, at above 12% of final household consumption expenditure, the second largest consumption component in 2009 in Brazil, Indonesia, and the Russian Federation (where only manufactured goods with shares of well above 30% were more widely consumed), and the third largest in China and India. Education, healthcare, and social services accounted for a surprisingly high share of total consumption in all five countries – as high as 19% in China where only the

consumption of manufactured goods was higher. Also relatively high in all the countries except Indonesia were real estate services which accounted for between 7% and 11% of total consumption. Business services seemed to be more important components in Brazil, with 6%, and India, with 4%, while Brazil's consumption of financial services was also higher, at 7%, than in the other four countries. This is most likely due to traditionally high real interest rates, rather than higher consumption of financial services in Brazil. Consumption that meets basic needs, like the consumption of agricultural goods, made up a relatively small fraction of total consumption in 2009 in all BRIIC economies depicted, with the exception of India.

Figure 4.3. **One-tenth (or more) of household consumption is spent on education, healthcare and social services in emerging economies, with the exception of the Russian Federation**

Sector shares of final household consumption in 2009



Notes: Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Comparable data for South Africa was not available. The data are retrieved from input-output tables. Thus, retail and wholesale services as a component of final household consumption do not include the net values/prices of goods, only the value added that retailers or wholesalers create by selling goods.

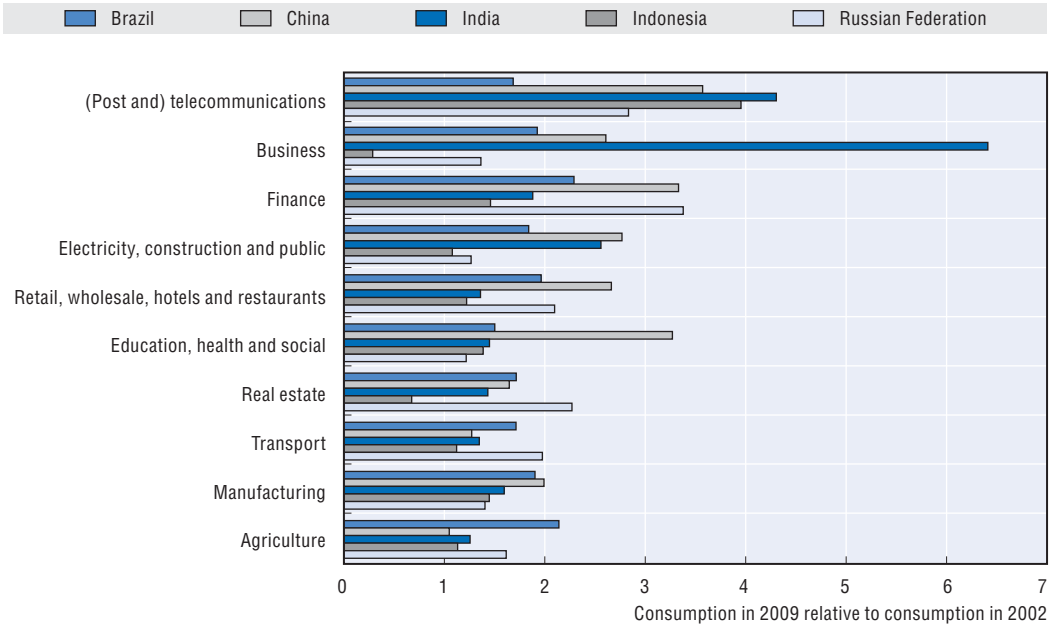
Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933058312

The dynamics of the growth in the consumption of services and agricultural and manufactured products reflect the steadily growing importance of the consumption of services in emerging economies (Figure 4.4). Total consumption growth in the five BRIIC countries was lowest in agricultural and manufactured products between 2002 and 2009, increasing by a factor of just 1.5 on average. Only in transport and real estate services was consumption growth similarly low.

Figure 4.4. **Emerging consumption pools in many service sectors**

Total final household consumption in 2009 relative to 2002, by sector



Notes: Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Comparable data for South Africa was not available. Consumption growth factors are based on real consumption values in 1995 prices. Growth factors above 1 indicate that final household consumption increased between 2002 and 2009 in the sector concerned. In Indonesia, household consumption of business and real estate services fell during the period being studied. However, consumption of these services was very low in 2002 – they accounted for only 1.6% of total household consumption. The fall is therefore not economically significant.

Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink *http://dx.doi.org/10.1787/888933058331*

China's total consumption grew remarkably by factors of over 2.5 in all other services. Indeed, in education, healthcare and social services, and in financial and telecommunications services the factor was well above 3. In the Russian Federation, better access to financial services prompted an increase in total consumption of financial services of more than 300%. As for India, the total consumer basket expanded enormously between 2002 and 2009 in the areas of business and post and telecommunications services, where the growth factors were 6.4 and 4.3.

The fast-growing demand for consumer services in large emerging economies, particularly China and India, offers huge potential for innovation and growth not only in those countries themselves, but in all other developing and developed economies that may eventually supply services in foreign emerging markets (Box 4.2).

Moving up the value chain in manufacturing can be enabled through business process outsourcing

An important aspect enabling higher value-added manufacturing in developed economies is that they make growing use of business-related services (e.g. labour recruitment, IT, marketing, customer contacts, market analysis, and R&D) and that they outsource them to independent firms. Outsourcing in developed countries is an "Adam Smithian" process driven by the gains from specialisation and scale economies. Such gains are not automatic – they may be achieved only if the right conditions – modern ICT infrastructure, stable contract enforcement, intellectual property rights – are in place.

Box 4.2. **Internet-based innovations in retailing tailored to Chinese demand**

The case of retailing in China shows that fast-growing demand comes with the provision of innovative and increasingly Internet-based business solutions. Chinese e-commerce increased by 70% between 2009 and 2012 and reached a 6% share of total retailing in 2012 from around only 3% in 2009. According to a recent survey by consulting firm Bain & Company, Chinese shoppers use their smartphones more often than shoppers in other countries to make purchases, are comfortable with third-party payments and online banking, are willing to rely on third parties for deliveries, and like discounts (Hoffmann and Lannes, 2013). Furthermore, more than half of the surveyed Chinese shoppers say that, independently of whether they end up making the purchase – online or in a physical store – they look up the products online and make price comparisons before they buy. Such habits are less pronounced among shoppers in the United States and Europe. However, nearly 70% of Chinese shoppers who buy online go first to a physical store to view and choose a product before returning to their computer or smartphone to make the actual purchase.

Only those retailers that manage to keep up with the transforming shopping and purchasing habits of Chinese consumers can benefit from further growth. Providing the opportunity to buy online becomes relevant even for brick-and-mortar stores, whose business concept still relies on a physical store where shoppers can see and purchase their products. China's online giant, the Alibaba Group, is now in the process of developing concepts which allow conventional retailers to become more Internet-savvy. In a pilot project in October and November 2013, the Alibaba Group invited brick-and-mortar stores to participate in a pilot project where their customers were encouraged to check out products in physical stores, put their favourites into online shopping carts by scanning two-dimensional bar codes with their smartphones and buy their choices on a specified day later on, when huge discounts had been offered (Meng, 2013).

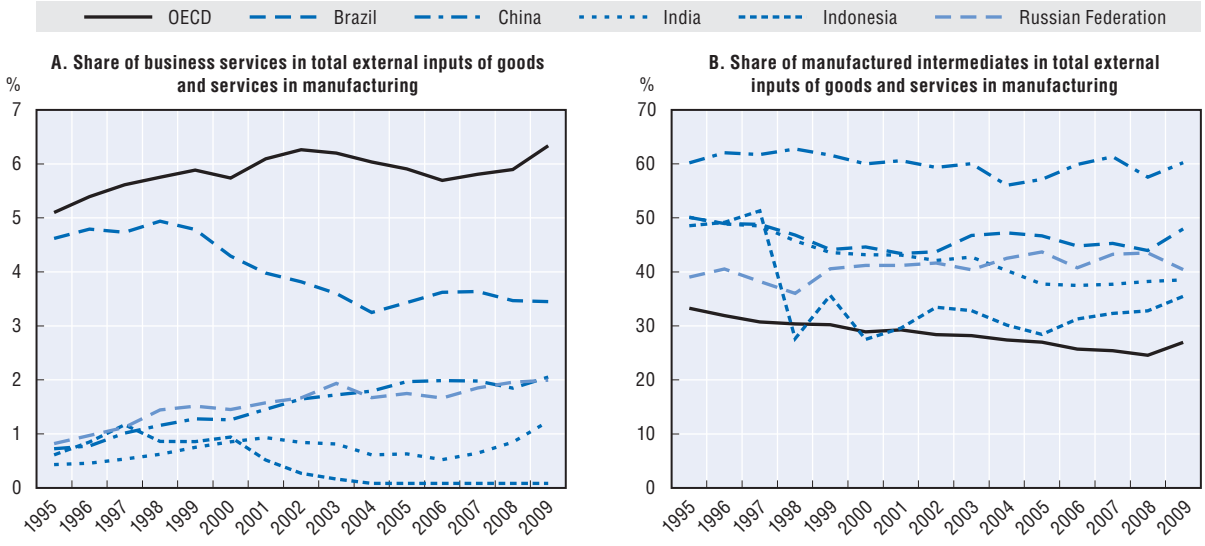
With such a concept, the group shows how retailing can better account for current and future purchasing behaviour of Chinese consumers. More generally, to remain competitive in a given consumer service sector (here retailing), the example illustrates that service providers need to adapt their existing business practice, innovate particularly towards Internet-based solutions, and tailor their concepts to consumers in a given market. A flexible regulatory business environment including low administrative entry and exit barriers for start-ups, generally low administrative burdens to change the structure of business and particularly low restrictions to start online businesses will facilitate adaptation in the consumer service markets.

Replicating the outsourcing practices of developed countries in emerging economies – if the necessary preconditions were met – would help to move up the value chain in manufacturing. (See below for a discussion of how to foster business services to support higher value-added manufacturing). Middle-income countries with slowing growth in their manufacturing sectors, due (among other things) to higher labour costs and competition from low-income economies, must rise to the challenge of improving their competitiveness through productivity gains and innovation. Consequently, the more sophisticated manufactured goods become, the greater the input from services is likely to be. In other words, as the cost advantage of low-tech products fades, countries increasingly have to switch to more specialised products (Cattaneo et al., 2013).

Linkages between some services and manufacturing may increase the competitiveness of manufacturing, as illustrated by advanced economies' greater use of outsourced business support services in manufacturing. In the OECD area, business service inputs accounted for some 6% on average of all inputs into manufacturing between 1995 and 2009 (Figure 4.5, Panel A). The BRIICS economies (excluding South Africa, for which data are not available) drew on outsourced business services far less intensively than OECD countries. In 2009, Brazil came closest to OECD levels with around 3.5% of outsourced service input in manufacturing. Chinese and Russian manufacturers stepped up their use of business process outsourcing, although it was still a relatively small 2% of total inputs in 2009. The manufacturing sector in India makes only very little use of outsourced business services – 1% of total inputs in manufacturing – a remarkably low share given that India is a successful exporter of BPO services.

Interestingly, the share of intermediate manufactured goods in total inputs was lower in the OECD and fell from 33% to 27% between 1999 and 2009 (Figure 4.5, Panel B). The sparing use of intermediates is in line with the OECD practice of producing specialised, technology-intensive goods that involve less assembly activities. By contrast, China makes the most intensive use of intermediates in manufacturing: it is inherent to the country's production model of importing intermediates, assembling them, then re-exporting the finished products.

Figure 4.5. **Business process outsourcing in emerging economies is still underdeveloped**



Notes: Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Business services are defined by ISIC sectors 71-74. Comparable data for South Africa was not available.
Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

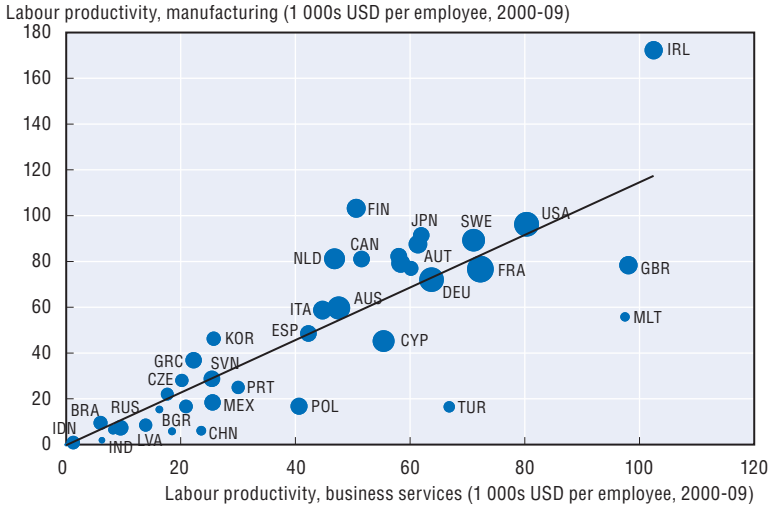
StatLink http://dx.doi.org/10.1787/888933058350

Analysis highlights significant differences between developed and emerging economies in manufacturing structures. They point to the risk that developing countries' efforts to improve their production capacity may grind to a halt because of their below-benchmark use of outsourced business services. Computerisation and R&D, for example, become increasingly critical to competitive, innovative manufacturing as countries grow richer and have to compete on productivity rather than costs. Furthermore,

countries that are productive manufacturers are also productive providers of business services and use them intensively in manufacturing (Figure 4.6). This comparison does not, however, allow any conclusions to be drawn about causation between manufacturing and business services. More intensive use of business services in manufacturing may have a learn-by-doing effect, which boosts productivity in those services. In contrast, business services may be used more intensively because their productivity has reached a high enough level to improve competitiveness in manufacturing too. However, irrespective of the direction of causality, countries that use business services less intensively should investigate how they may make more effective use of them to improve productivity in manufacturing (Evangelista et al., 2013).

Figure 4.6. **Business service productivity and intensity of use are positively associated with manufacturing productivity**

Labour productivity in business services versus labour productivity in manufacturing



Notes: The bubble size denotes the share of business services inputs in the total inputs used in manufacturing. The shares of business service inputs in total inputs used in manufacturing range from 0.2% in Indonesia to 13.3% in France. Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Business services are defined by ISIC sectors 71-74. Country names are abbreviated by 3-digit ISO codes. Comparable data for South Africa was not available.

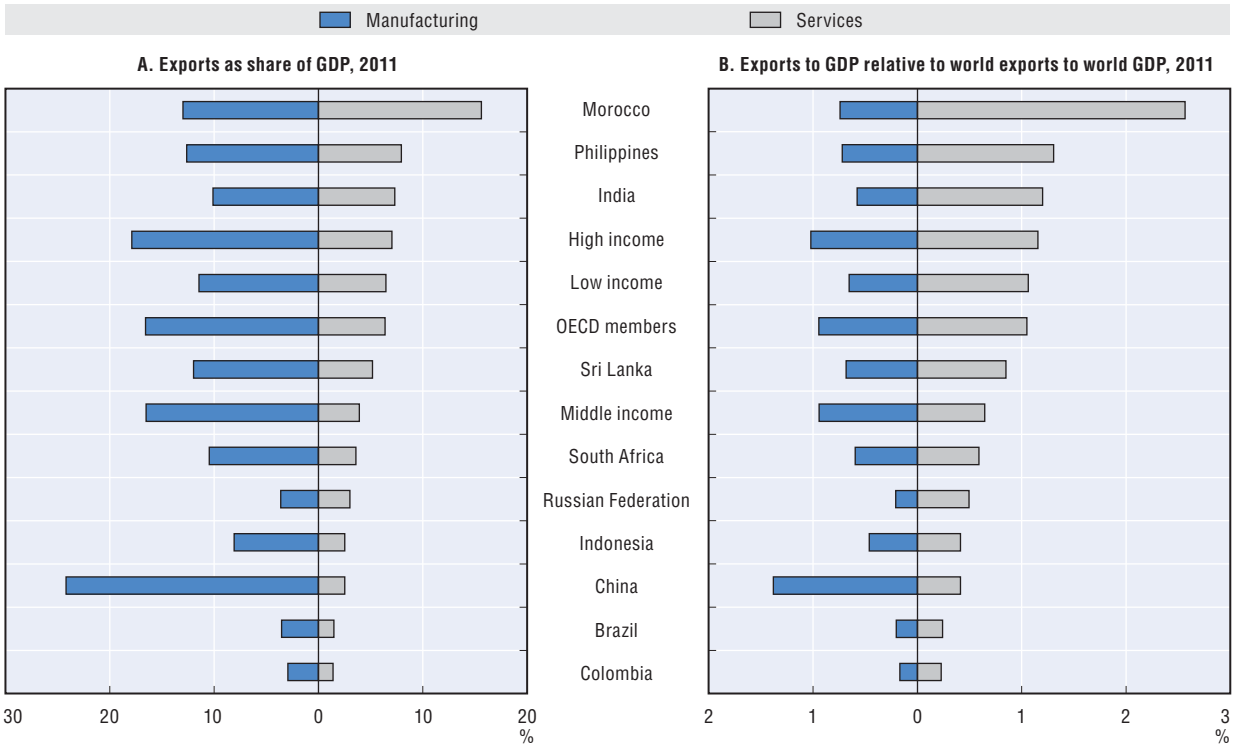
Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933058369

Can exporting services be a sustained growth strategy?

Exports of services may sustainably drive growth in developing countries. For example in India, Morocco and the Philippines, service exports contribute more to GDP than in OECD countries.[3] In 2011, the ratio of service exports to GDP was highest in Morocco at 15%. In the Philippines the ratio was 8% and in India 7%, both slightly higher than the OECD average of 6% (Figure 4.7, Panel A). Other BRIIC countries report considerably smaller shares of service exports in their GDP – the ratios are 1.5% in Brazil, 2.5% in China and Indonesia, and 3% for the Russian Federation.

Figure 4.7. **Morocco, the Philippines and India have the highest service export shares of GDP**



Source: Authors' calculations based on World Bank (2013b), *World Development Indicators 2013*, World Bank, Washington DC, *databank.worldbank.org/data/download/WDI-2013-ebook.pdf* .

StatLink http://dx.doi.org/10.1787/888933058388

With the sole exception of Morocco, where the 13% ratio of manufacturing exports to GDP is slightly below the same ratio for services, manufacturing exports account for a higher share of GDP than service exports in all the countries under scrutiny. The finding is in line with the evidence that no country has evolved into a high- or even middle-income economy without first developing a manufacturing sector.

Relative to their economic size, Morocco, the Philippines, and India over-proportionally supply world demand for service imports. The ratio of service exports to GDP relative to the ratio of world service exports to world GDP stands at 2.6 in Morocco, 1.3 in the Philippines, and 1.2 in India (Figure 4.7, Panel B). Again, the metric clearly reflects service exports' currently small contribution to GDP in Brazil, the Russian Federation, Indonesia, China, and Colombia – the ratios of 0.24 in Brazil and 0.23 in Colombia are particularly low. The ratios for manufacturing exports are well below 1 for the top three service exporters, illustrating the strong comparative advantage secured by trading services rather than manufactured goods. Only China, the second biggest world exporter of goods behind Germany with a ratio of 1.4, supplies more manufacturers on world markets than may be expected from its economic pie.

Countries whose GDP shows a high share of services exports also boast large shares of ICT and business services exports shares in their total services exports. They are highest in the Philippines and India where they make up more than 70% of services exports. In Colombia and South Africa, where services exports contribute less to GDP, the share of ICT and business services is less than 20% of total services exports. By contrast, travel-related

and, increasingly, BPO service exports account for a considerable share of the total services exports of Morocco, the country where they account for the highest proportion of GDP.

High service exports have been among the main drivers of economic growth in Morocco, the Philippines, India, and some other South Asian economies in recent years (Ghani, 2010). As a result, the contribution of services to development is food for thought and has raised the question of whether economic development latecomers that have gained a comparative advantage from exporting services may focus on service-led growth strategies. Although the export of services, particularly BPO, may lift sustained economic growth, economies that are currently services-led should not focus solely on that channel, but diversify their economies (see Box 4.5, Truth and myth in India's services miracle).

Heavy focus on the narrow BPO sector may deliver brisk short- and medium-term growth, but will not lead to a successful development trajectory. Moreover, over-reliance on exports exposes countries to external shocks. An even more ill-advised development strategy is to rely primarily on tourism. Countries like Morocco and the Dominican Republic, where the tourism sector employs 17% and 15% of the workforce and boasts a 19% and 15% share of GDP, respectively, are vulnerable to shocks such as conflict, natural disasters, and long-lasting economic crises in advanced countries which lead to sharp cuts in tourist spending (World Travel and Tourism Council, 2013).

Lagging competitiveness in service sectors of emerging economies

As in manufacturing, sustained competitiveness in the service sector can be achieved only through higher productivity and efficiency. How do the productivity levels and growth of emerging economies' service sectors compare to those of manufacturing and the OECD benchmark? Which emerging economies allocate inputs most efficiently?

Emerging economies need to catch up in service sector productivity

While labour productivity growth in services is higher in emerging than advanced countries, BRIIC productivity levels are still considerably lower than those of the OECD economies. This section compares in detail the productivity levels and growth of emerging countries' service sectors with performances in the OECD area and manufacturing.

Labour productivity in emerging economies lags far behind levels in developed countries

Services like telecommunications, financial and business services, which, on the face of it, have the greatest potential as drivers of sustainable overall growth, account for a share of GDP in low- and middle-income countries that is considerably lower than in advanced countries (see Figure 4.1). Productivity, too, is markedly below the OECD average. However, labour productivity levels in the services sector have to be taken with a pinch of salt as measurement of real output is often based on assumptions and interpretations of labour productivity can be ambiguous (Box 4.3). Furthermore, the analysis does not correct for purchasing power parity (PPP). Making use of a PPP rescaling might reduce the productivity gap between emerging and advanced economies. The non-availability of sectoral PPP figures in the countries under consideration excludes this correction. Despite the caveats of labour productivity measurements, it is helpful to compare these productivity measures across countries and types of services in order to get a first understanding of relative competitive edges. The limitations do however need to be taken into account in all the estimates.

Box 4.3. **Performance measures other than labour productivity may be more appropriate in services, particularly in finance, education, and health and social services**

Labour productivity levels can be used as a measure of competitiveness in services, albeit with caveats, as it is often difficult to measure the appropriate output. To begin with, services are generally less standardised than manufactured goods and show a particularly high degree of product differentiation. Accurately measuring service volumes and prices is therefore difficult, as deflators for service sectors are less likely to be appropriate than those for manufacturing. Furthermore, service output is often measured by the costs of inputs (mainly wages). Comparing different countries or industries by labour productivity level will be biased by national differences in input costs and input mixes (Triplett and Bosworth, 2008; Schreyer, 2001).*

Despite such caveats and the data constraints that impinge on appropriate analysis, it is still useful to compare the labour productivity levels of different services across countries in order to get a feeling of relative competitive stances. In fact, due to increased tradeability, differences in labour productivity are likely to reflect differences in quality – with higher productivity levels reflecting higher quality services. Furthermore, looking at growth as opposed to levels of labour productivity is less problematic, particularly as the input mixes and the structure of input costs can be expected to remain similar over a given period of scrutiny. Finally, as regards policy, it is more meaningful to draw conclusions based on a country's efforts and/or ability to improve productivity rather than on its productivity level alone. For all these reason, the analysis of productivity growth should receive special attention when investigating competitiveness from a policy perspective.

The limitations of labour productivity for measuring the competitiveness of financial, educational, and health and social services are further illustrated below. Some alternative performance indicators that may be more suitable for assessing competitiveness in those sectors are proposed.

In the financial sector, value added – often used to construct labour productivity – can be measured only indirectly and imprecisely. One method that is often applied is the financial intermediation services indirectly measured method (FISIM). It evaluates the gross value added of the sector by taking the total interest income received by financial intermediaries, then subtracting the total interest payable, excluding the value of any other income receivable from the investment of own funds and any other business costs. Obviously, the FISIM has its limitations when it comes to evaluating the performance of the financial sector as a whole – particularly as the generated value of financial services firms that focus more heavily on the investment business would be completely excluded.

Moreover, given the sector's systemic importance for the economy, a higher value added per employee in financial services may not actually be a target. In fact, higher value added per employee could be associated with reduced access to finance for some businesses, i.e. it is granted only to big or risky firms. In the context of economic development, comparisons of financial deepening – measured by the amount of outstanding credit as a percentage of GDP – may be more useful than labour productivity in financial services. However, labour productivity in the financial sector is in fact closely correlated with the amount of outstanding credit as a percentage of GDP. This indicates that economies with deeper financial markets tend to produce more output per employee in the financial sector.

* The analysis in this chapter does not correct for purchasing power parity (PPP) in the different economies. Making use of a PPP rescaling might reduce the productivity gap between emerging and advanced economies. The non-availability of sectoral PPP figures in the countries under consideration excludes this correction.

Box 4.3. **Performance measures other than labour productivity may be more appropriate in services, particularly in finance, education, and health and social services** *(cont.)*

However, more appropriate indicators of the performance of the financial sector are, for instance, cost efficiency measures, which gauge how efficiently inputs to the production of financial services are combined to produce outputs.

In education, healthcare, and social services, labour productivity measured as output per worker may also not be an appropriate measure of competitiveness since those sectors traditionally provide services with public good characteristics. Nevertheless, it would be useful to assess efficiency – by looking at how cost efficient the provision of high outcomes in a particular service is, for instance – not least because output in education, healthcare, and social services sectors is simply quantified by the value of costs in national accounts and does not therefore reflect their performance. Alternative measures of education and health sector competitiveness could be indicators of those services' broad availability, accessibility, and quality. With respect to education, quality may be assessed by PISA scores or similar outcome indicators. Also worth consideration are efficiency analyses where the input may, for example, be public spending on education and the outcome pupil performances (Sutherland et al., 2007).

In the BRIIC countries, the calculations suggest that labour productivity in services never exceeded one-third of the OECD level between 1999 and 2009 (Figure 4.8). The exception in financial services in Brazil, whose productivity was 60% of the OECD average in 2009, may be explained by Brazil's high interest rates compared to other BRIICs. China is about half as productive as the OECD benchmark in business services (which includes accounting, architectural, legal, and engineering services). In telecommunications, the third sector most likely to benefit from ICT, Brazil again leads the emerging economies in these productivity levels estimates.

Within a broader set of non-OECD economies, estimates of productivity levels in financial and business service activities vary greatly. Financial service productivity is particularly low in low-income countries such as Kyrgyzstan (see Figure 4.A1.1, Panel A in the annex). Having emerged as a successful financial centre in recent years, Panama has the highest labour productivity estimates of the non-OECD economies studied in 2007,[4] with employees in the financial sector over 30 times more productive than those in Kyrgyzstan. Argentina and the Dominican Republic ranked second and third in the same comparative study (Box 4.4).

Not surprisingly, productivity in the financial sector is closely tied to overall economic development. The partial correlation between labour productivity in financial service activities and outstanding loans to the private sector as a percentage of GDP (a proxy for financial development or financial deepening) is very high – 0.67. This reaffirms the importance of developing a strong, stable financial sector which will ultimately also strengthen the competitive stance of a country as a whole.

Similarly in business services, labour productivity estimates in developing countries range between very low in Albania, El Salvador, and Paraguay and relatively high in Botswana, Panama, and Turkey (Figure 4.A1.1, Panel B in the annex). Business service workers in those countries are about three-quarters as productive as their counterparts in Germany, a country with well-developed business services.

Box 4.4. **Panama's competitive financial service sector: What are the challenges ahead?**

Panama lies on one of the world's crossroads, connecting trade routes between North and South America, on the one hand, and the Atlantic and Pacific Ocean via the Panama Canal, on the other hand. This privileged geographical position – together with heavy investment in the Canal and telecommunications infrastructure, a successful international integration strategy through free trade agreements with major trading partners (such as the United States, the European Union and Canada), free interest rates, a fully open international banking sector, and generous fiscal incentives – allowed Panama to develop internationally competitive service sectors which include financial services. According to the World Economic Forum's *World Competitiveness Report 2013-14*, Panama ranks among the top 12 countries for the availability and affordability of its financial services, ease of access to loans, venture capital availability and the soundness of its banks (Schwab, 2013).

Panama has also put in place effective mechanisms for exchanging information for tax purposes in line with the OECD Model Tax Convention and Model Tax Information Exchange Agreement (TIEA)*.

Panama should also take advantage of its favourable macroeconomic conditions to accelerate financial sector reform, such as building capacity to monitor systemic risks and upgrading the supervision of non-bank financial institutions (IMF, 2013). Improving transparency in both tax and financial systems would help sustain a competitive financial sector in Panama. Such action would improve Panama's reputation as a trading partner that ensures level playing fields, which would in turn facilitate its further integration through FDI and trade into non-finance sectors, including manufacturing.

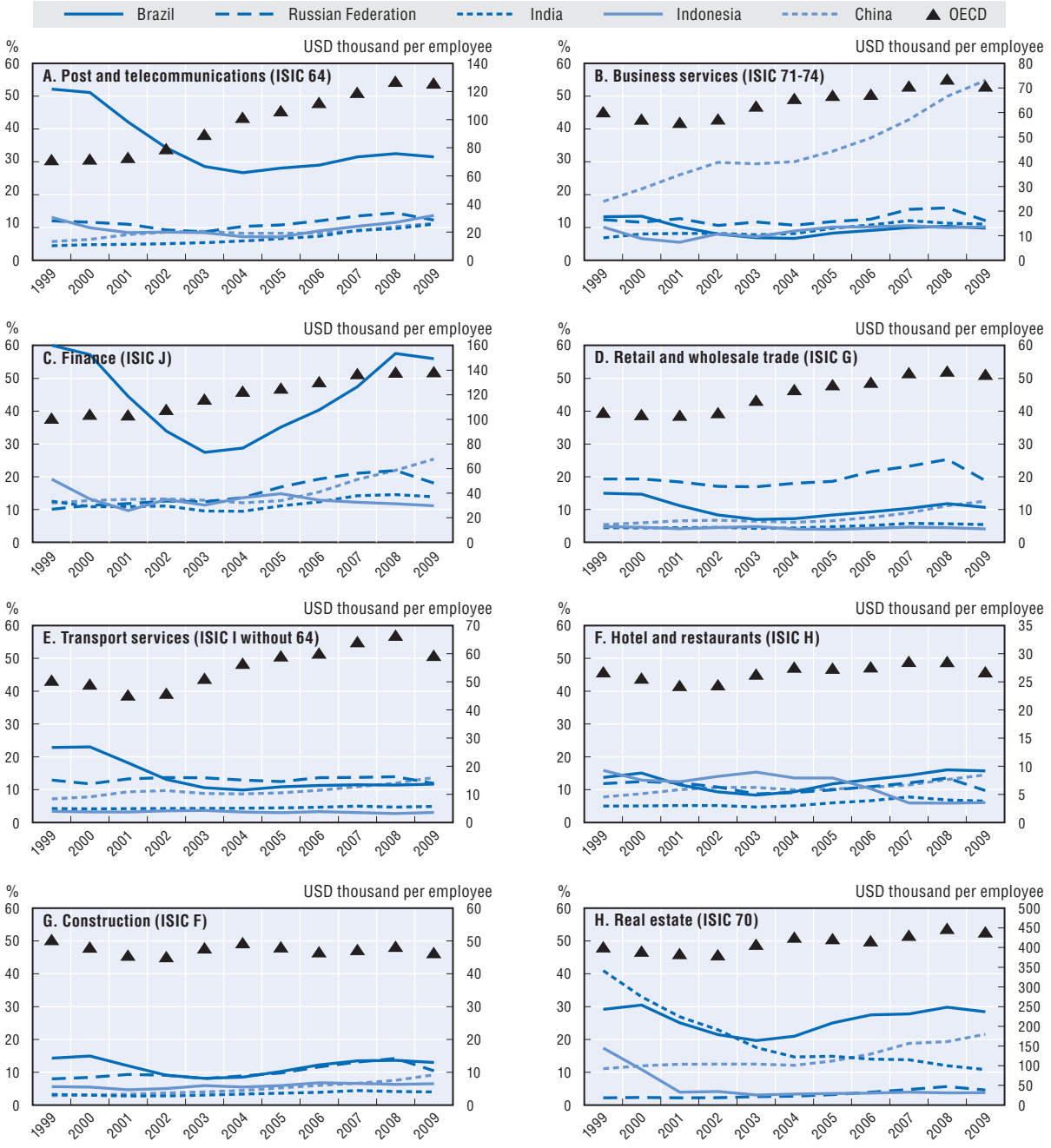
Recent public investment and other economic development policies have produced dynamic economic activities, which include financial services, focused on the Canal and in Panama City. These government initiatives have come at the expense of investment in agriculture, the main employer outside Panama City. Improved access to finance for micro and small (agri-)businesses, particularly in rural regions, is one of many challenges that need to be addressed (Bauza and Nash, 2013). Small-scale businesses often have little or no access to formal financial services. Public institutions could therefore foster the micro-finance sector, currently among the least developed in Central America, through guarantee schemes that lower the risk for private actors.

* For references of international treaties of Panama, visit the official site of the Ministry of Foreign Affairs: *http://mire.gob.pa/tratados*.

In BRIIC countries, productivity level estimates for services (which, on the face of it, are likely to benefit least from ICT) are less than 30% of those in advanced economies (Figure 4.8). Such services are hotels and restaurant services retail and wholesale, transport, construction, and real estate. All are less productive than telecommunications, financial and business services – even in advanced OECD countries. While there is growing trade in traditional services, they are still more personal in nature – i.e. actual people provide the services and usually do so from the same location as their customers. Traditional services' generally lower productivity is not surprising as they do not lend themselves so easily to scale economies. They also show wide productivity gaps between advanced and emerging economies, which may be explained by lower input costs (wages), often used to measure outputs in traditional services (see Box 4.3).

Figure 4.8. **Service productivity in emerging economies lags far behind the OECD average, though some countries are making ground**

Labour productivity in BRIICs relative to the OECD (LHS)
OECD labour productivity in USD thousands per employee (RHS)



Notes: Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Labour productivity relative to the OECD of 1 stands for a productivity level on a par with the OECD. Labour productivity is calculated from real value added in 2002 USD prices using sector-specific deflators. The OECD average labour productivity is weighted by size, i.e. the numbers of employees working in a sector. Corresponding ISIC sectors are in brackets. Comparable data for South Africa was not available. The OECD average does not include Chile, Ireland, Israel, New Zealand, Norway and Switzerland. In Brazil, the apparent drop in productivity in most services may be explained by extraordinary market conditions (which have led to significant demand and exchange rate shocks) rather than structural factors (see endnote 7 for more details).

Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933058407

Despite its relatively high shares of service exports (Figure 4.7), India is – according to the estimates – the least productive BRIIC country in almost all services (including business), which suggests that its success in exporting services may be related to its competitive prices – i.e. its low labour costs. The average wage in business services, for example, still stood at the very low level of USD 1 000 per annum in 2009. In contrast, firms in China paid their employees 17 times more, in Germany 35 times as much, and France 67 times higher. Once it no longer enjoys this price-cum-cost advantage, India may find it difficult to compete in service exports if it does not improve productivity (Box 4.5).

Productivity in financial and business services is often higher than in manufacturing

According to estimates, which admittedly have some caveats, in 26 selected low- and middle-income countries, it emerges that workers in the financial services sectors are at least as productive as those in manufacturing (Figure 4.A1.1, Panel A, right-hand y axis, in the annex and Box 4.3 for a discussion of caveats). In 11 of the countries, the ratio of financial services to manufacturing productivity is between 1 and 2. In 9 countries workers in the financial sector are more than twice as productive as those in manufacturing, most strikingly in Panama where the ratio is 4.5. In Argentina and Costa Rica financial sector productivity is slightly lower than in manufacturing, while in Azerbaijan, which has low financial depth (the loans-to-GDP ratio is just 16% compared to Panama's 96%), employees in the financial sector appear to be only half as productive as in manufacturing.

Business services show a similar pattern – productivity is at least twice as high as in manufacturing in 19 out of 26 countries (Figure 4.A1.1, Panel B, right-hand y axis, in the annex). With ratios of around 1-to-5, the difference is widest in countries as diverse as Panama, Brazil, Bolivia, and Ethiopia.[5] As for the productivity of more traditional service sectors – such as retail and wholesale and construction services – they are lower than in manufacturing both in OECD and developing countries.

Some emerging countries are catching up with productivity in developed economies

The most dynamic emerging countries at the beginning of the 21st century – the BRIIC countries – generally had higher labour productivity growth than the OECD benchmark between 1999 and 2009 according to available calculations (Figure 4.8).[6] However, OECD members also managed to increase productivity in most service sectors in the period 1999-2009, particularly in telecommunications, where it rose by 75%. Of the BRIICs, China's productivity in business services has made up the most ground, climbing from 20% of the OECD average in 1999 to above 50% in 2009 (Figure 4.8, Panel B). This improvement was surprising in that the regulatory environment in business services in China did not considerably improve during the period concerned and was still far more restrictive than in the OECD area in 2008 (Conway and Nicoletti, 2006). India's business service regulatory environment was less restrictive than China's, too, yet it has been unable to narrow the labour productivity gap in recent years and remains at around 10% of the OECD average. China may, therefore, have achieved productivity growth in business services thanks to its booming manufacturing sector, which has allowed business-support services to benefit from spillover and scale effects despite its still restrictive regulatory conditions.

Brazil reported the highest labour productivity levels of the four BRIIC countries in financial and telecommunications services over the period 1999 to 2009 (see Figure 4.8, Panels A and C). However, they underwent a sharp productivity loss at the beginning of the millennium: the productivity gap with the OECD widened by more than 30 percentage

Box 4.5. **Truth and myth in India's services miracle**

India has been commended in recent years for its growth in the services sectors. It implemented extensive regulatory reforms in both the manufacturing and service industries in the 1990s, easing trade protection and abolishing licensing and capacity rules for its manufacturing industries. It also opened up service sectors (like telecommunications, banking, and transport) to private competition and widely deregulated – freeing up prices in the financial services, for instance. Big shifts in the economy ensued: between 1980 and 2010, the share of manufacturing value added in GDP increased from 24% to almost 28%, while the services' share rose from 40% to 54%. Growth in India had two faces: first, productivity improvements kicked in during the 1980s and, second, the reforms of the 1990s spawned new private service enterprises.

Services, however, are characterised by a fundamental divide between types of activities. The contribution of traditional services (such as retail and wholesale) to total services has declined since the 1980s and contributes only moderately to growth. In contrast, finance, business and IT-related services, which constituted only 20% of all services in the 1960s, accounted for 40% in the 2000s. Some service-related activities started from very low levels and have experienced exceptionally high two-digit growth rates in the past two decades (Eichengreen and Gupta, 2011).

Although growth in the service industry has outpaced that of manufacturing in most years, it has not been matched by equivalent increases in shares of employment: non-traditional services (such as finance, telecommunications and business services) rely heavily on highly skilled labour and offer only limited employment opportunities. Their joint share in total employment was only 2.5%. Closely related to this particular development was India's unique education policy, which focused on tertiary education in the 1970s and 1980s (and expanded broad-based primary and secondary education only much later). Indian firms have consequently long been able to draw on a pool of educated workers at moderate wage levels. In the future, skilled labour may become scarce and the cost advantage may fade.

Taken together, these findings suggest that the services still offer the Indian economy considerable growth potential. Services' productivity in India is, however, still lower than in many comparable countries. The services industry will have to contend with the dwindling supply of moderately paid skilled labour and its consequent loss of competitive advantage. This reinforces the need for improvements in service productivity (Bosworth et al., 2007).

Growth in the services is nearly jobless and lacks inclusiveness, given that agriculture still accounts for 50% of employment. In the last ten years, the industrial sector has exhibited better employment absorption capacities than services, which suggests that India should not neglect developing its manufacturing base. In this respect, inter-industry linkages and multiplier effects can be important: possibly due to the very low initial quality and availability of services, there is some evidence that improvements in services during the 1990s had considerable effects on manufacturing, pointing to the importance of ties between the two sectors (Arnold et al., 2010).

points in finance and 20 in telecommunications between 1999 and 2003. While productivity recovered in finance, regaining its 1999 level by 2009, it stayed low in post and telecommunications services at around 30% of the OECD level. The apparent drop in productivity in these services in Brazil may be explained by extraordinary market conditions (which have led to significant demand and exchange rate shocks that may not

be properly accounted for by the deflators) rather than structural factors.[7] Moreover, steeply rising wage costs that again may not be accounted for by the deflators could explain significant productivity changes in Brazil.

Similarly, India's productivity in real estate services, which was higher than in other BRIIC countries, shrank significantly between 1999 and 2009 according to the available estimates (Figure 4.8, Panel H). The fall was probably driven by sharp price adjustments that may have not been fully captured by the price deflators used. Furthermore, measuring output in the real estate sector is not straightforward and makes the interpretation of labour productivity estimates difficult (see Box 4.4 on caveats to labour productivity as a performance measure in the financial sector). Output in real estate is generally measured partly by turnover of property management firms and partly by real estate developers' earnings on investment.

In retail and wholesale services, OECD members managed to increase productivity by an average of 30% between 1999 and 2009 (Figure 4.8, Panel D). Similarly, the 17% productivity growth in the transport services since 1999 has been as dynamic as in business-related services in the OECD (Figure 4.8, Panel B and E). No productivity improvements in the OECD were observed in hotel and restaurant services during the same period, labour productivity in the sector has been highly cyclical though (Figure 4.8, Panel F). In construction, a slight dip in productivity was actually observed in the OECD during the same period (Figure 4.8, Panel G).

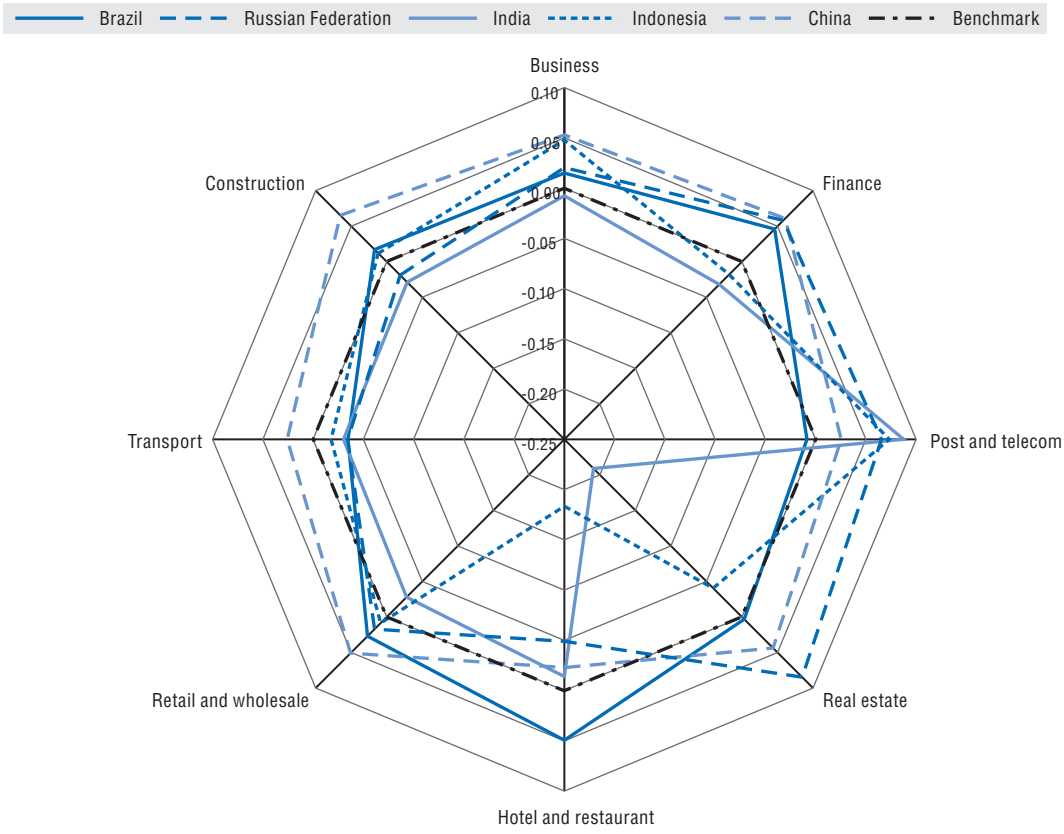
Emerging countries' productivity in many services grows faster than in manufacturing

In the years before the global economic crisis, BRIIC countries' labour productivity in business, financial, and post and telecommunications services grew often faster than in manufacturing according to available estimates. The compound annual growth rate of labour productivity in manufacturing in the BRIICs was very high during the period 2002-07[8] – around 5% in Indonesia, 7% in Brazil and China, 10% in the Russian Federation, and 13% in India. Along with relatively high productivity growth rates in manufacturing, BRIIC countries often reported even higher productivity improvements in the three service sectors (Figure 4.9). In China, for example, labour productivity growth in business and financial services was 5 and 6 percentage points higher than in manufacturing. Outperforming their manufacturing counterparts by 7 percentage points in all services where new ICTs play a particular role, Russian employees reported the most significant productivity growth rates in post and telecommunications. Brazilian workers engaged in the same services improved their productivity on a par with those in the manufacturing industry. As expected, the telecommunications sector in India is the most dynamic, with an average productivity growth rate of almost 9 percentage points above manufacturing. In India, all other services activities where productivity growth may be expected to benefit from ICTs were in fact less dynamic than manufacturing. Productivity growth in Indonesia was twice as high in post and telecommunications and business services compared to manufacturing.

The more traditional service activities (in the hotel and restaurant, retail and wholesale, transport, construction and real estate sectors) mostly appear less dynamic than manufacturing. A clear exception is the retail and wholesale sector where Brazilian, Russian, Indonesian and Chinese workers improved productivity at faster rates than in

Figure 4.9. **Productivity growth in financial, telecommunications and business services on par with or higher than in manufacturing**

Labour productivity growth in service sectors in BRIIC countries
compared to manufacturing, in percentage points
Productivity growth measured by compound annual growth rate between 2002 and 2007



Notes: Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Benchmark (in black) denote a productivity growth difference of zero with respect to manufacturing. Labour productivity is calculated from real value added in 2002 USD prices using sector-specific deflators. Comparable data for South Africa was not available.

Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink *http://dx.doi.org/10.1787/888933058426*

manufacturing. Chinese workers also turn out to be more dynamic in the transport and construction services than those in manufacturing, while construction service employees in Brazil outperform those who work in manufacturing according to the available estimates.

The results for total factor productivity (TFP) improvements are largely in line with labour productivity growth figures (see Figure 4.A1.3 in the annex).[9] Productivity improvements in OECD countries tend to be smaller than those in the BRIICs and the service sectors most likely to benefit most from new ICTs (i.e. telecommunications, financial and business services) have shown higher TFP growth than manufacturing in recent years. China is an exception – its TFP growth in the manufacturing sector is considerably higher than in most services (only utilities report higher productivity improvements than manufacturing).

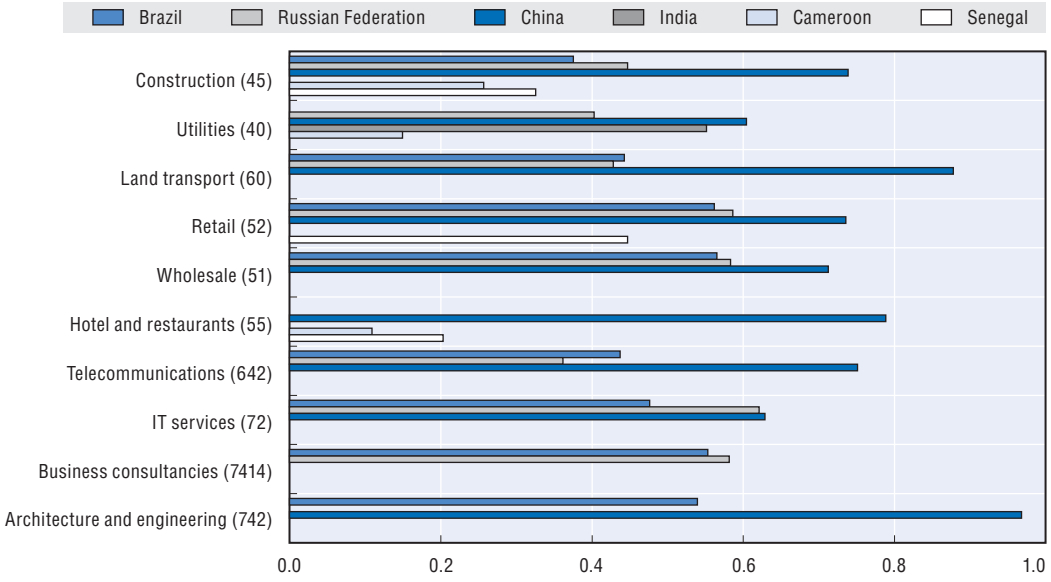
China's service providers allocate inputs more efficiently than their peers

Average sector technical efficiency scores obtained from data envelopment analysis (DEA) based on firm-level data for 2008 suggest that China's service providers use their input more efficiently than their peers in the BRIICs (Figure 4.10).[10] Technical efficiency scores can be used to qualify industry-level labour productivity and TFP results and to draw general inferences as to the quality of the production factors used. The analysis reveals that higher labour productivity levels are not necessarily correlated with higher technical efficiency scores. For example, China ranks mid-table among the BRIIC countries for labour productivity in different service sectors (see Figure 4.8), but outdoes them in DEA efficiency. In other words, service firms in China perform well, given the available input mix (which might be at the lower end of what would be an optimal mix of labour, capital, and intermediate inputs). Moreover, unlike in the case of manufacturing where efficiency in China may be reduced due to significant underutilisation of capital in some sectors, service sectors are still underdeveloped and thus not subject to inefficient capital use.

In telecommunications, land transport, construction, hotel and restaurant, as well as architecture and engineering services, Chinese firms stand out sharply from those of their BRIIC peers. As Figure 4.10 shows, China's average efficiency score in telecommunications

Figure 4.10. **China's service sector firms allocate inputs efficiently**

Average technical efficiency scores based on 2008 firm-level data in various services industries



Notes: Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Recognising that firms are interested in increasing their market shares and profits, technical efficiency is defined here as the relative efficiency of firms in maximising those outputs subject to labour, intermediate input and capital costs. The underlying method of solving this maximisation problem is data envelopment analysis (DEA), a non-parametric estimation method to calculate technical efficiency scores. While a score of 1 corresponds to the efficiency frontier or benchmark being aligned to one or a few firms independently of their origin, average sectoral DEA scores of below 1 denote below benchmark efficiency levels. Efficiency scores are not comparable across sectors. See Table 3.A2.4 in Chapter 3 for details on the methodology. Missing country-specific bars for some sectors mean that firm-level data were not or not sufficiently available to include the country in the DEA analysis of the sector concerned. Due to data limitations, DEA analysis could not be performed for some service sectors at all, e.g. financial services. Corresponding ISIC sectors are in brackets. Comparable data for Indonesia and South Africa was not available.

Source: Authors' calculations based firm-level data from ORBIS data and national sources. ORBIS is a database containing comprehensive information on companies worldwide, with an emphasis on private company information, and is managed by Bureau van Dijk (*https://www.bvdinfo.com*).

StatLink http://dx.doi.org/10.1787/888933058445

in 2009 was 0.75, nearly twice those of Brazil and the Russian Federation (the only two other countries for which sufficient data were available). The very low score in the Russian Federation is surprising in that it broke up the state telephone monopoly in 1990, since when several private communications firms have accessed the Russian market. Similarly in Brazil, given the fully liberalised telecom market (without restrictions on foreign capital), firms may be expected to be more efficient than in China where foreign entry and local competition is still limited. Despite the relatively liberal telecom markets in the Russian Federation and Brazil, competitive pressure (measured by mark-ups) remains relatively low, however (see Figure 4.13 below).

In the construction, utilities, retail, and hotel and restaurant services, Figure 4.10 includes data for Senegal and/or Cameroon. In those services, Senegalese and Cameroonian firms were, on average, found to be less efficient than firms in BRIIC countries for which data were available.

Building competitiveness-enhancing environment for services

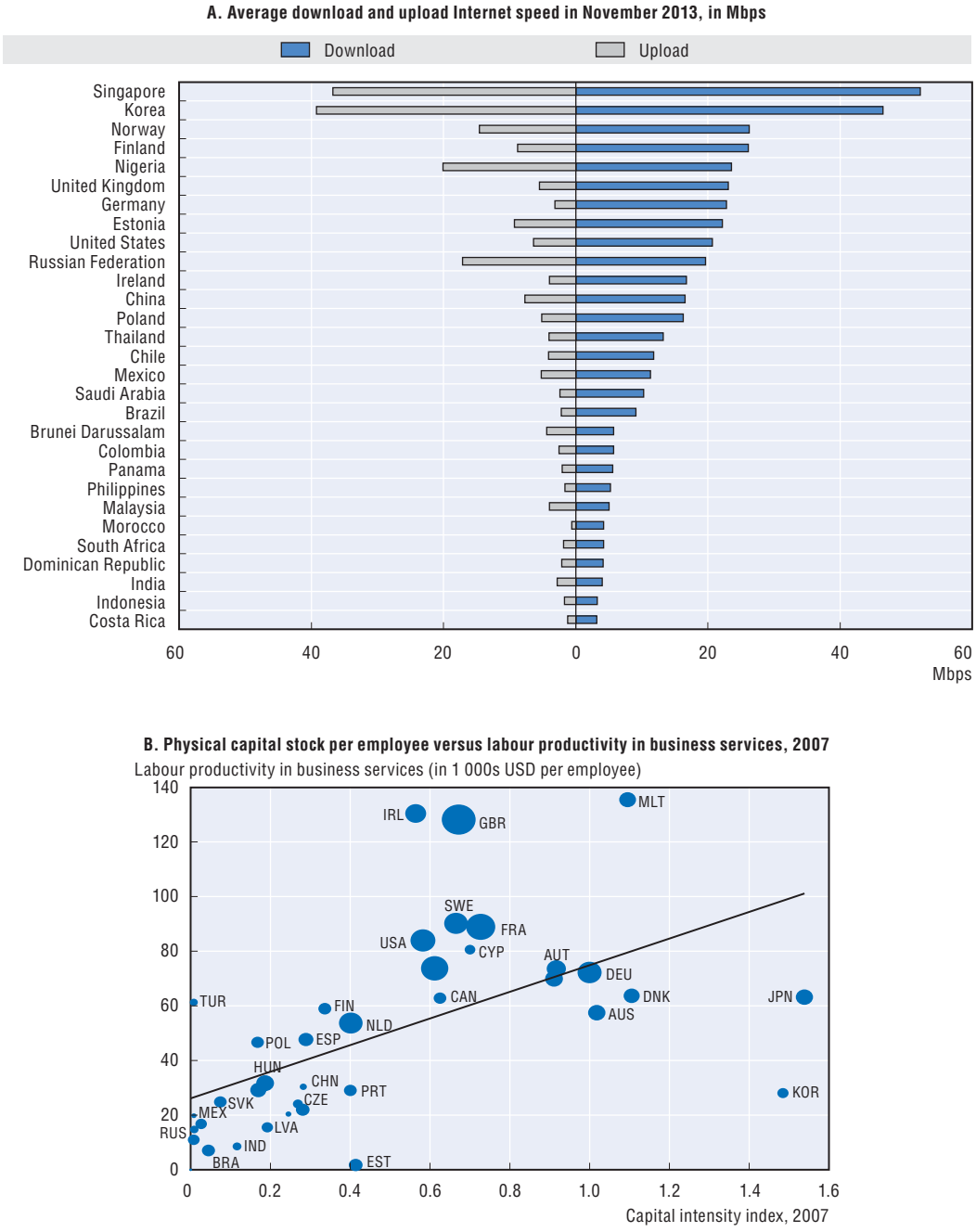
Countries are at different stages of development and therefore require different sets of policies for improving the competitiveness of their economies in general and their service sectors in particular. In lower-income countries, underdeveloped infrastructure is probably one of the most important constraints on development. Building an adequate infrastructure will consequently facilitate productivity gains in all sectors, including services. In contrast, emerging economies may have developed the infrastructure needed, but have regulatory burdens that make the market rigid and access difficult for potentially efficient, highly productive new firms. Such countries should focus on policies which create business-friendly market conditions and on incentives in sectors where a country is most likely to reap the benefits of its comparative advantage. This section spotlights and elaborates on some of the factors that may determine competitiveness in services and suggests policy options to facilitate and boost the development and improvement of services.

Stable and modern ICT infrastructure is critical

A prerequisite for competitiveness in services is a stable, high-quality ICT infrastructure that incorporates fixed and mobile phone networks and high-speed Internet connections, particularly in business services where continuous use of modern ICT lies at the heart of operations. Many low- and middle-income countries may not deliver this requirement. Average download speeds of below 6 Mbps in Colombia, the Philippines, Morocco, and India in contrast to over 40 Mbps in Singapore and Korea point to a significant backlog in ICT infrastructure (Figure 4.11, Panel A). Countries that are increasingly exporting BPO services therefore need to improve their ICT infrastructure so as to improve productivity in business services in the medium term. However, ICT infrastructure may already be relatively well developed in ICT clusters in these countries (e.g. in Hyderabad in India). Geographically targeted development of ICT infrastructure can thus be a successful strategy to develop a comparative advantage in BPO services.

The need for ICT infrastructure is further confirmed by the close positive association in business services between labour productivity and capital intensity (where capital includes fixed assets in general and ICT equipment in particular). Indeed, countries with higher capital intensity in business services have a greater share of total value added in that sector. For example, emerging economies such as Brazil, India and the Russian Federation had very

Figure 4.11. **In emerging economies, internet speed and capital intensity in the ICT-dependent business service sector lag behind levels in advanced countries**



Notes: In Panel A, the average download and upload speeds are based on millions of recent test results from the Ookla speedtest, an online index that compares and ranks consumer broadband speeds around the globe (*www.speedtest.net*). The value is the rolling mean throughput in Mbps per day in November 2013 where the mean distance between the client and the server is less than 300 miles. The estimate provides an average for the country as a whole. Internet speed may be considerably higher in some cities or regions in these countries (e.g. in Hyderabad in India). In Panel B, the size of the bubble denotes the value-added share of business services in total value added. Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Business services are defined by ISIC sectors 71-74. The capital intensity index is based on capital stock per employee, where the value for Germany is set at one.

Sources: Authors' calculations based on Net Index (2013), *Net Index* (database), *http://netindex.com* for Panel A and Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf* for Panel B.

StatLink http://dx.doi.org/10.1787/888933058464

low capital intensity scores of less than one-fifth of the level in Germany in 2009 (Figure 4.11, Panel B). In the three countries, the business service sector's productivity and share of total value added were significantly below levels in advanced economies.

In countries like India, Morocco, and the Philippines, which have relatively high shares of simple BPO service exports of GDP, the development of high-quality, modern ICT infrastructure should be an immediate priority, particularly for their business service clusters. Infrastructure will help the sector to grow further and to branch out into more sophisticated ICT-enabled services. However, the three countries cited (and many other emerging countries, such as Colombia) still face huge challenges in the provision of other network services, particularly in transport and energy. Given that governments of developing countries enjoy only limited financial and management resources, they should give country-wide transport and energy infrastructure development priority over modern ICT in order to facilitate diversification and higher-value-added production beyond services. However, as the case of India shows, it is still possible to setup ICT clusters in these countries where ICT infrastructure is well developed.

Because of the natural monopoly characteristic of infrastructure, governmental institutions are well placed to co-ordinate the building of network infrastructure. However, another option could be public-private partnership contracts through open tendering processes, which the Philippines and India (among other countries) used for their transport and energy infrastructure (OECD, 2012).

The operating business of telecommunications, which includes the provision of Internet services, may be separated from network development. Multiple service providers should be able to compete for the provision of market operation services on payment of an appropriate network user fee. Not charging for network use could lead to disincentives to invest, as Korea's experience exemplifies (OECD, 2011).

In practical terms, opening up the telecommunications market is often a difficult process for political reasons and state monopolies – or former state monopolies – still dominate the provision of telecommunications in many developing, emerging, and even developed, economies. Among many other requirements, a well-functioning market for telecommunications operators needs an effective competition law – like the recently adopted 2011 Competition Law in Mexico, which incorporates fines for abuse of market power. Another critical requirement is a competition authority that combines the analytical ability to understand competition in a given market with appropriate powers of enforcement. Ultimately, breaking longstanding monopolies in network industries is, however, possible only if the rule of law and political will for structural reform are strong.

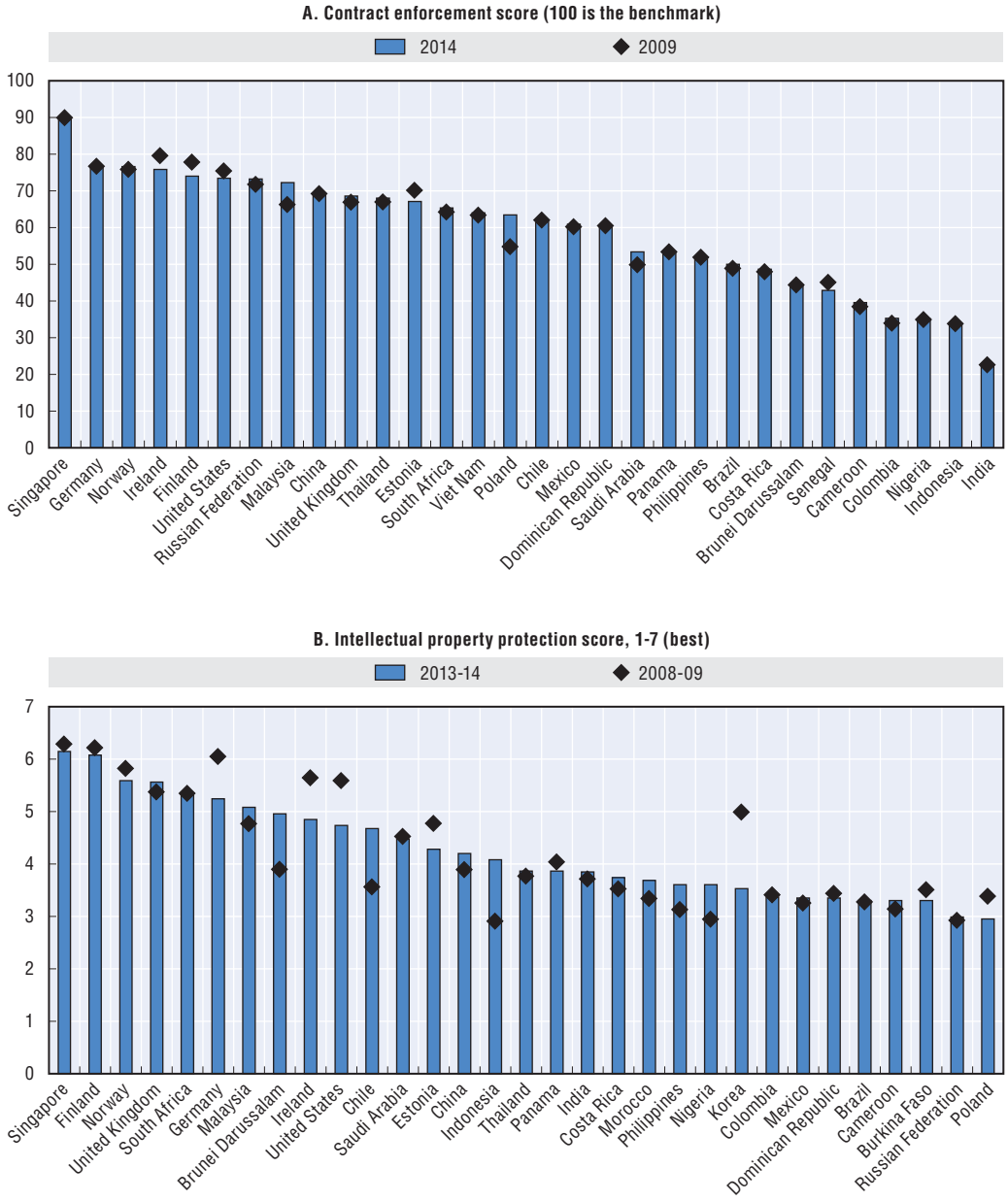
Enforcing contracts and intellectual property rights serve as anchors for competitive service sectors

Developing competitive service sectors is facilitated when a contract enforcement system is in place. The intangible nature of services makes the need for contract enforcement particularly important as counterparties are difficult to sanction in the event of a contract being breached. The absence of contract enforcement may prevent new service firms from starting up and deter foreign ones from entering.

Contract enforcement requires that a legal system incorporates effective mechanisms of law enforcement – in other words, an impartial judicial system. In many emerging and developing economies, courts are subordinated to the government and their decisions are likely to be arbitrary, inefficient and influenced by a political party. India, Indonesia,

Nigeria and Colombia, for instance, all have relatively inefficient procedures for settling commercial disputes – to judge by the time, cost, and number of procedures involved from the moment a plaintiff company files a lawsuit to the time it finally receives payment (Figure 4.12, Panel A). According to this multiple metric, India, Indonesia, Nigeria and

Figure 4.12. **Limited improvements in contract enforcement and intellectual property protection in developing countries**



Notes: In Panel A, the contract enforcement score is defined as the efficiency score (relative to 100) for settling commercial sale disputes measured by the time, cost and number of procedures involved from the moment the plaintiff files the lawsuit to when it receives payment. The benchmark is 100 and is constructed from the best performance across all economies and years. In Panel B, the score is based on the views of firm executives interviewed in WEF's Executive Opinion Survey 2013-14.

Sources: Authors' calculations based on World Bank (2013c), *Doing Business* (database), *www.doingbusiness.org/* for Panel A and Schwab, K. (2013), *World Competitiveness Report 2012-13*, World Economic Forum, Geneva for Panel B.

StatLink http://dx.doi.org/10.1787/888933058483

Colombia scored less than 40 on average in 2013, where 0 denotes the worst performance and 100 the best across all economies and years. Of the four countries, only Colombia has improved contract enforcement since 2009.

A further important requirement is that frameworks for intellectual property protection should be in place to safeguard incentives for developing services and introducing innovations. Creative, innovative solutions in service sectors as different as architecture and education come increasingly in the form of electronic content and are thus vulnerable to piracy attacks. The enforcement of intellectual property rights (which encompasses electronic content) is thus critical to a prosperous, competition-enhancing environment for modern services. According to the World Economic Forum's Executive Opinion Survey 2013-14 (Schwab, 2013), the protection of intellectual property in South Africa and Malaysia is viewed as relatively strong, while Brunei, too, has considerably improved its score since 2008-9 (see Figure 4.12, Panel B). China, for its part, receives a lower score. Yet, there are indications that when the injured party seeks legal recourse over possible intellectual property rights infringements, matters are often settled adequately, according to the American Chamber of Commerce in the People's Republic of China (AmCham China, 2012). However, local businesses in Brazil, Colombia, Mexico, and the Russian Federation routinely rate their countries' intellectual property provisions as relatively weak. Countries with inadequate intellectual property protection should raise awareness of laws and institute penalties for infringements as a deterrent.

Market-friendly business environments for services foster productivity gains

A competitive business environment should also be fostered in non-network services. Competitive pressure (estimated by mark-ups based on firm-level data in Brazil, China, the Russian Federation, Cameroon and Senegal) tends to be higher in computer-related activities, construction, and retail and wholesale services than in transport, hotel and restaurant, and telecommunications services (Figure 4.13). This finding is consistent with mark-up estimations of service sectors in OECD countries (Bottini and Molnar, 2010). Competitive pressure may stem from the rules of conduct imposed by the regulator or from openness to trade and FDI, or it may be specific to particular sectors and markets.

In retail and wholesale services, mark-ups are particularly low in Brazil, the Russian Federation, and China. Similarly, in construction, they are below 10% in all countries for which valid estimates are available. Firms in computer-related activities reach mark-ups of above 10% in Brazil, the Russian Federation and Senegal, but they remain almost as low as in retail and wholesale services in China.

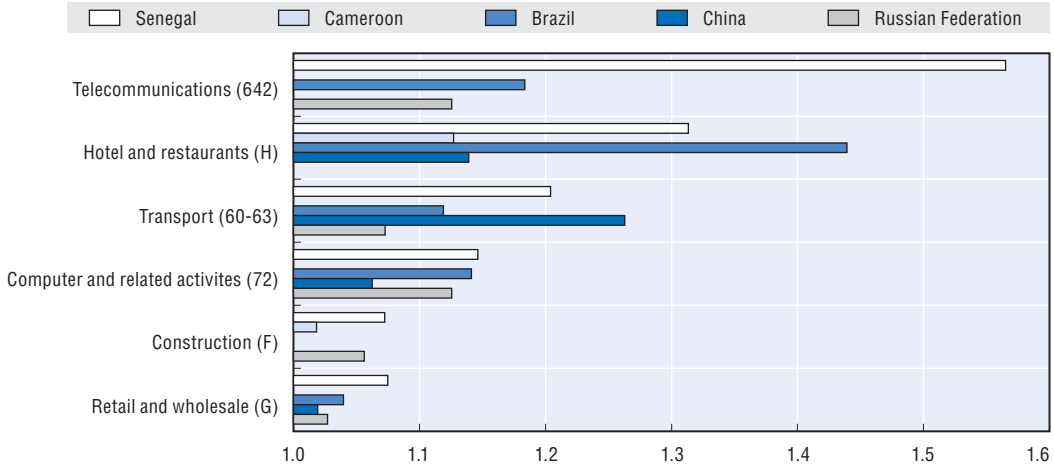
In transport services, competitive pressure is strong in Brazil and the Russian Federation, while particularly high mark-ups in air transport services account for the high average mark-up figures of China and Senegal, which denotes relatively low competitive pressure.

While Brazilian and Senegalese firms seem to wield greater market power in the hotel and restaurant services and telecommunications services relative to its peers, competitive pressure is on par with other countries in other services for which estimates are available. As for Brazil, although it has widely liberalised its telecommunications market and allowed foreign entry, mark-ups are still relatively high (World Bank, 2013a).

Overall, the estimated mark-ups point to intense competition in the investigated services sectors, particularly in the three BRIIC economies of Brazil, China and the Russian Federation. This finding is consistent with the argument that less segmented

Figure 4.13. **Mark-ups are particularly low in computer-related activities, construction, and retail and wholesale services**

Mark-ups drawn from firm-level data between 2002 and 2008



Notes: The method proposed by Roeger (1995) is used to estimate mark-ups (see Annex 3.A1 in Chapter 3 for details on the methodology). The closer a mark-up is to 1, the higher is the competitive pressure in the service sector concerned. ISIC codes are indicated in brackets. Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3).

Sources: Authors' calculations based on firm-level data from ORBIS for China and the Russian Federation and national statistics for Brazil, Cameroon and Senegal. ORBIS is a database containing comprehensive information on companies worldwide, with an emphasis on private company information, and is managed by Bureau van Dijk (*https://www.bvdinfo.com*).

StatLink http://dx.doi.org/10.1787/888933058502

markets, which offer fewer customer-specific services, have generally lower mark-ups – and all the sectors do provide relatively standardised services. Accordingly, businesses in highly segmented consultancy activities (with mark-ups of above 50% in Brazil, for example) face less competitive pressure,[11] while generally liberal regulation in retail and wholesale and computer-related activities has lowered market entry barriers and thus heightened competitive pressure (World Bank, 2013a).

Relatively high competitive pressure has probably supported the strong productivity growth of recent years in the BRIICs. In all sectors – including the more traditional retail-wholesale and transport services – all three BRIICs report average annual compound growth in labour productivity of around 10% and above between 2002 and 2007 (for productivity growth see Figure 4.8). Growth in telecommunications, which started from a higher level, is lowest (5%) in Brazil where incumbent firms face lower competitive pressure than in the Russian Federation, for example. Higher competitive pressure due to market-friendly, liberal business environments thus seems to be associated with stronger incentives for firms to increase productivity and efficiency as part of their bid to remain competitive.

International openness can make services more competitive

Import restrictions in service sectors are often less transparent than tariffs or remedial action in goods trade. Countries introduce restrictions behind the border and may incorporate regulations that limit the access of foreign firms to open subsidiaries and/or branches or to the supply of services without even a physical presence. Some restrictions also limit foreign ownership or even prohibit FDI in services. Mexico, for example, still does

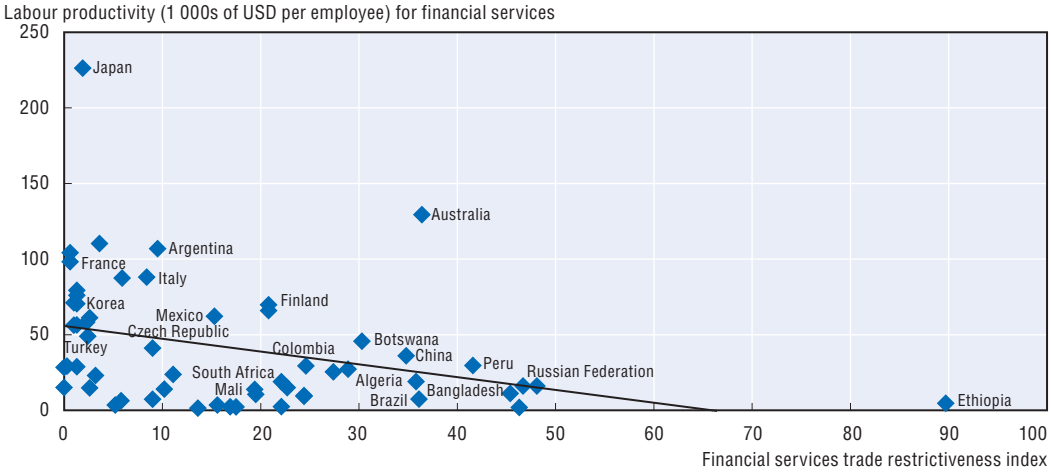
not allow foreign ownership of telecommunications firms, although a new bill that is pending final approval by the two State Congresses intends to liberalise FDI in the sector, while keeping a 49% foreign ownership ceiling (Global Trade Alert, 2013).

Restrictions of service imports are usually greater in developing countries, where long-standing monopolies – particularly in utilities, which include telecommunications and financial services – are protected from foreign and domestic competitors. According to recent measures of overall service trade restrictiveness, India and the Philippines curb imports the most, while other emerging economies, such as China and South Africa, also rank among the world's 30 most restrictive countries (World Bank, 2013a).[12]

The example of the financial services sector illustrates how higher cross-border trade restrictions are associated with lower labour productivity in the domestic market. Shielding firms from foreign competitive pressure limits incentive to improve productivity, which stagnates at low levels as a result (Figure 4.14). While low-income countries generally report high import restrictions coupled with lower productivity (e.g. Bangladesh and Ethiopia), some middle-income ones like Argentina, Mexico, and Turkey which have relatively low barriers protecting their financial services market boast more productive workforces than higher income countries with more restrictive regulations. Accordingly, regulatory reform can be an effective way to enhance firms' competitiveness in world markets.

Figure 4.14. **Higher restrictions of financial services imports are associated with lower productivity**

Financial services trade restrictiveness index versus labour productivity in financial services, 2010



Sources: Authors' calculations based on World Bank (2013a), *Services Trade Restrictions Database (STRI)* (database), *http://iresearch.worldbank.org/servicestrade/* and Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933058521

Local capabilities should be preserved and strengthened

Opening up to international trade requires a balancing process that seeks to foster competition while preserving and, most importantly, further developing home-grown capabilities. What is the right regulatory environment to that end? Can China's successful manufacturing sector strategy be replicated in the services – in other words, can competitive services be developed locally before being opened up to international trade? If so, is the strategy advisable for other developing countries?

Given that modern services are highly knowledge-intensive (in contrast to assembly manufacturing in which China has become very competitive), a certain degree of international openness may be desirable from the beginning so as to glean spillover knowledge. However, in order to smooth the adaptation process, countries should follow a step-by-step, trial-and-error approach towards opening up their service sectors. Liberalising too fast may irreversibly damage the domestic sector, as exemplified by Hungary's liberalisation of the retail sector (Sass and Kalotay, 2012). The country allowed its former state-owned retailers to be taken over by foreign firms, which sourced their goods chiefly from foreign suppliers. As a result, local upstream capabilities in the retail sector have all but died out.

Should SMEs receive special attention in service policy design?

Industrialisation has been associated with large-scale factory production since the early days of the Industrial Revolution and a country's income levels was positively correlated with the scale of the establishments. Often informal SMEs were initially a dominant source of employment, but as income per capita rose, the predominance of small businesses declined (Taymaz, 2002). With the severe economic crises of the 1970s, however, SMEs proved to be successful in competing against larger firms. SMEs' increased share of employment and the rise in their output in developed countries in the 1980s reaffirmed that they were central to the industrial fabric as a whole and among the main drivers of innovation. As a consequence, SME support programmes have been adopted all around the world, although wide-ranging evidence shows that productivity differences between small and large enterprises persist – regardless of country-specific factors and whether firms operate in the manufacturing or services sectors (see Chapter 3).

Productivity differences between smaller and larger companies in the services have not been widely studied. One reason may be that scale effects in some services sectors have become relevant only with the recent ICT revolution. In principle, however, even if scale effects can now more easily be achieved, it is by no means clear that larger companies necessarily yield higher productivity levels. Their ease of adjustment and innovative capacity may actually allow smaller firms to yield higher productivity levels, especially if starting a business entails few fixed effects.

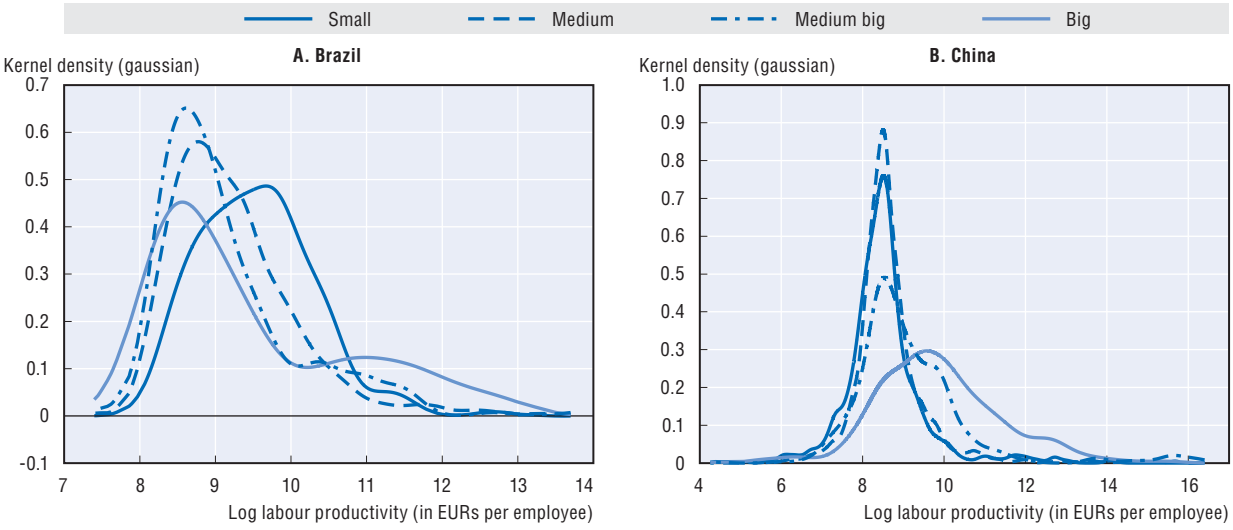
In Brazil, for example, the labour productivity of small firms of between 20 and 49 employees in the telecommunications, financial and business services is, on average, considerably higher than those of larger companies (Figure 4.15). The distribution of productivity levels within size categories show, however, large overlaps between categories, which points to additional factors accounting for productivity differences. Furthermore, some big facilities (more than 1 000 employees) seem to be very productive, adding a second peak to the density distribution function for the labour productivity of Brazilian firms in the telecommunications, financial, and business services.

By contrast, large-scale services providers in the same field in China are, on average, more productive than smaller counterparts. Size does not, however, seem to be determinant in competitiveness among firms with less than 1 000 employees: average productivity levels are about the same and the distributions have relatively thin tails.

Similar patterns of labour productivity levels by size are observed for manufacturing sectors in both Brazil and China, which raises the question as to whether economy-wide, as opposed to sector-specific, factors may be responsible for this outcome (see Chapter 3).

Figure 4.15. **Smaller firms in telecommunications, financial and business services are more productive in Brazil, but less productive in China**

Kernel density functions for labour productivity of firms in telecommunications, financial and business service activities, by firm size



Notes: Estimations of Gaussian kernel density functions are based on log value-added labour productivity in EUR per employee at the firm level. For Brazil, firm-level data between 2005 and 2009 was used for the following services: 641, 642, 65, 66, 67, 70, 71, 72, 73, 7411, 7411, 7412, 7414, 742, 743. The density functions for Brazil are based on 184, 369, 256, 170 observations for small, medium, medium-big and big firms, respectively. For China, firm-level data between 2003 and 2010 was used for the following services: 641, 642, 65, 66, 67, 70, 71, 73, 7411, 7413, 7414, 742 (sector codes correspond to the ISIC rev. 3 classification). The density functions for China included 1005, 2420, 664, 695 observation for small, medium, medium-big and big firms, respectively.

Source: Authors' calculations based on ORBIS database. ORBIS is a database containing comprehensive information on companies worldwide, with an emphasis on private company information, and is managed by Bureau van Dijk (*https://www.bvdinfo.com*).

StatLink http://dx.doi.org/10.1787/888933058540

Recent estimates ranking the business environment in Brazil and China show that the barriers to entrepreneurship and administrative burdens on start-ups in Brazil are almost as low as in OECD countries, but still considerably higher in China (OECD, 2010b). Such impediments may be partly responsible for the fact that the productivity levels of China's small manufacturers and service providers are lower than in Brazil, where small companies are emerging as the most productive size category.

Given that the size of the firms most likely to deliver efficient outcomes is not immediately obvious in any given service market, policies that promote only smaller firms (defined by some arbitrary threshold) may have a negative impact on productivity and distort firm growth (Bartelsman et al., 2013 and Garicano et al., 2012). Therefore, generic policies that stimulate competition and lower market entry barriers are probably the best choice for obtaining an efficient, competitive services industry. Nevertheless, governments should nurture smaller service firms with potential for driving productivity by supplying the conditions necessary for their expansion, such as information centres, networks, consultancy services, and some financial assistance.

With respect to finance, as service firms (particular small start-ups) are generally short on collateral and consequently face credit constraints. Government should therefore consider schemes to lend financial support to businesses with innovative new service concepts so that they can establish themselves. Where the lack of collateral is a constraint, carefully designed government guarantees may facilitate access to funds. And when all else fails, informal financing in accordance with basic regulations may also be a way to

channel much-needed funds to firms that lack collateral (Tanaka and Molnar, 2008). Another idea might be for government bodies to collaborate with educational institutions in business-case contests where the winners are awarded grants to help them establish their venture (Box 4.6).

Box 4.6. **The Russian Skolkovo Innovation Centre uses competitive mechanisms, such as business case contests, to select innovative start-ups**

The Skolkovo Innovation Centre is a high-technology business area, which has been developing near Moscow since 2010. The Centre seeks to concentrate international intellectual capital and thereby stimulate the development of breakthrough business projects and technologies in five clusters, which include information and energy-efficient technologies. Companies and individuals that are engaged in innovative solutions are discovered through competitive tendering processes. Selected companies receive all the support they need to develop their business ideas. Support may take the form of grants, marketing guidance, information centres, networks, and/or logistical assistance.

One particular way in which the Centre identifies and fosters innovation is to collaborate with local and international educational institutions that organise business case contests for their students. For example, the INSEAD Centre for Entrepreneurship in France and Singapore organises an annual venture competition among its MBA students. The competition consists of three stages: screening, semi-finals, and finals. Ventures are in domains like mobile phone applications, business-support services, and media and healthcare service solutions. The winners receive a grant, sponsored by the Skolkovo Innovation Centre, which can be used to start the venture. Winners may also be awarded additional grants to start their venture directly on the Skolkovo Innovation Centre site.

Such competitive schemes can be effective governments tools for fostering innovation in the services and high-technology sectors. Such schemes should explicitly state, however, that official funding is for the development of an innovative (service) solution only. Financial support should be one-off or at least incorporate a sunset clause.

Note: For more information see Skolkovo Innovation Centre website, *www.skolkovo.ru/public/en/press/news/item/3440-2013-04-02-15/* or *http://centres.insead.edu/venturecompetiton/archives/25th_bvc/documents/20122Oct_CallforEntry_25thIVC.pdf*.

Service-specific advanced skills should be promoted

New services that increasingly use modern ICTs are particularly knowledge-intensive. Average skill intensity in advanced and emerging countries is highest in business services, where the share of hours worked by highly skilled employees (the "high-skill score") is 38%.[13] The score is similarly high in financial services, which also require highly skilled employees with in-depth specialisations. More traditional services activities, such as retail and wholesale or transport services, make less intensive use of high-end skills – their high-skill score is below 14%. Manufacturing's score is 12%, lower than in any other sector, except construction and hotel and restaurant services.

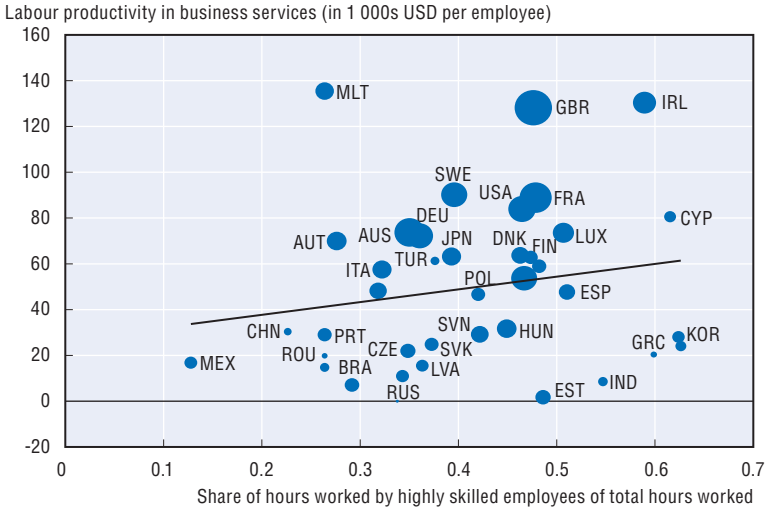
Average skill-intensity differences across countries could well point to their comparative advantages in certain sectors. Less developed countries may experience greater difficulty in staying competitive as the skills or quality of human capital demanded by particular services may be in shorter supply than in more developed countries. While accumulating human capital should be part of each country's development strategy, a successful restructuring policy

package should factor in the availability of skills. China, for example, became very competitive in manufacturing sectors like the garment industry where highly skilled workers were not needed, while at the same time providing its young people with higher education and training. With this newly formed human capital, it has consequently been able to move up the value chain in manufacturing and, to some extent, in services.

Employee skill intensity also varies considerably across countries within the same sectors. In business services, where specific skills are fundamental, the high-skill score ranges between 13% in Mexico and 62% in Korea (Figure 4.16). Countries that make more intensive use of higher skills turn out to be more productive and business services' share of total value added is higher.[14] If the skill intensity of production in a country is associated with its skill availability, then the sectors which make intensive use of higher skills can emerge as competitive and strategic sectors only if the required skills are indeed sufficiently available. Structural development policies are thus very much conditioned by the availability of human capital.

Figure 4.16. **Higher skill-intensity in business services is associated with higher productivity**

Share of hours worked by highly skilled employees versus labour productivity in business services, 2007



Notes: The size of the bubble size denotes business services' value added as a share of total value added. Sectors are classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Business services are defined by ISIC sectors 71-74.

Source: Authors' calculations based on Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933058559

However, growing a pool of highly skilled people may not be enough to subsequently develop in services. Strategies for appropriately matching available skills with those demanded by the market should be part of every country's development plan – be it to improve competitiveness in manufacturing or services. With respect to services, policy makers should consult and co-operate with firms to foster the development of advanced skills tailored to specific services, of which computer literacy and foreign languages (particularly English) are often among the most important. Co-operation between public and private institutions could take the form of apprenticeship programmes, where students spend part of the week in a private firm doing on-the-job training and the rest of

the week in the classroom. Such arrangements should also allow private institutions to contribute to educational curricula in their particular fields of expertise. Furthermore, policy schemes could include financial incentives for service firms to provide in-house training for their staff.

Key considerations for greater competitiveness and growth in services

Services could be a major engine of growth in emerging and developing countries: they boost consumption, complement manufacturing, and are increasingly tradeable. The service industry in emerging economies does in fact show high productivity growth. However, actual productivity levels still lag far behind those of advanced countries. To improve them, the following policy recommendations could be of help:

- A prerequisite for competitiveness in services is a stable, high-quality ICT infrastructure that incorporates fixed and mobile phone networks and high-speed Internet connections – not a given, even in the most dynamic emerging economies. The development of effective ICT infrastructure should be co-ordinated by government bodies, although public-private partnership contracts through open tendering processes may reduce the burden on public finances while increasing efficiency. Another boost to efficiency would be vertical separation in telecommunications, in particular with the network being made accessible to multiple service providers on condition they pay an appropriate network user fee.
- Effective contract enforcement and a framework for intellectual property protection are indispensable for developing competitive service industries. In particular, countries whose intellectual property protection is inadequate should raise awareness of laws, develop legislation that secures intellectual property rights from the outset, and put in place deterrent penalties for infringements.
- Service sector regulations that allow domestic firms to provide services abroad and foreign firms to establish subsidiaries in the country are likely to increase the incentive for domestic firms to improve productivity. However, when governments open up to foreign competition, they should ensure that local capabilities can be preserved and, most importantly, further developed. Because modern services are highly knowledge-intensive, a degree of international openness may be desirable from the outset so as to glean spillover knowledge. But in order to smooth the adaptation process, countries should follow an incremental, trial-and-error approach towards opening up their service sectors.
- Given that the size of firms most likely to deliver efficient outcomes is not immediately obvious in a given service market, growth policies that are restricted only to small firms defined by an arbitrary threshold may negatively affect productivity and distort firm growth. Therefore, policies that stimulate competition and lower market entry barriers are probably the best choice for building an efficient, competitive service industry. Nevertheless, governments should nurture smaller service firms with potential for driving productivity growth by providing the resources necessary for their expansion, e.g. information centres, networks, consultancy services, and financial assistance.
- Service firms, and in particular small start-ups, generally lack collateral and face credit constraints. Carefully designed government guarantees may facilitate access to funds. Also, informal financing extended in accordance with basic regulations may channel much-needed funds to firms that lack collateral. Innovative new ventures can also be helped into being through schemes where government bodies and educational institutions jointly organise business case contests that awards grants to the winners to help them start up.

Key considerations for greater competitiveness and growth in services *(cont.)*

- New services that increasingly use modern ICTs are particularly knowledge-intensive and can only emerge as competitive, strategic sectors in a country where the required skills are sufficiently available. Creating a pool of highly skilled people may not be enough to subsequently develop services. Strategies to appropriately match available skills with those demanded by the market should be part of every country's development plan, be it to move up the value chain in manufacturing or services. With respect to services, policy makers should consult and co-operate with firms to foster the development of advanced skills tailored to specific services, of which computer literacy and foreign languages (particularly English) are frequently among the most important. Such co-operation could take the form of apprenticeship programmes where students spend part of the week in a private firm doing on-the-job training and the rest in a classroom. Such arrangements should also allow private institutions to contribute to curricula in their fields of expertise.
- Despite the boost that exports of some services can lend to economic growth, currently services-led countries should not solely focus on that channel, but diversify their economies. A focus on BPO services and reliance on exports may bring strong short- or medium-term growth, however if the focus is too narrow and the reliance on exports causes exposure to external demand shocks there will be no successful development trajectory. An even more ill-advised development strategy is to rely primarily on tourism.

Notes

1. The BRIIC includes Brazil, the Russian Federation, India, Indonesia and China. Due to data limitations, this chapter mostly refers to the BRIIC rather than to the BRIICS (including South Africa in addition), which is used in other chapters of this volume.
2. Traditional services in this analysis include the following International Standard Industrial Classification (ISIC) activities: Electricity, gas and water supply (E), construction (F), wholesale and retail trade (G), hotels and restaurants (H), transport (60-63), public administration (L), education, health and social services (M, N, and O). Activities of private households as employers of domestic staff and extraterritorial organisations and bodies (P and Q) are not considered in the analysis.
3. The measurement of service exports is not as simple as the measurement of goods exports given that services do not go through customs. For statistical offices, it is, for instance, hard to measure how many back-office services are imported by domestic firms, as this information is usually kept by individual firms and not directly collected by public institutions.
4. In this comparison, 2007 rather than 2008 or 2009 is taken as the reference year, because labour productivity figures in 2007 are not expected to be influenced by the global economic crisis. Labour productivity figures for the same comparison in more recent years (i.e. 2010-12) are not available.
5. The distribution of productivity levels in non-OECD compared to OECD countries confirms that manufacturing productivity is on average lower than levels in financial and business services in both country groups and that average OECD productivity levels in those categories are always higher than in non-OECD low- and middle-income countries (see Annex Figure 4.A1.2). While all categories span a very wide set of productivity levels, figures for the non-OECD group show that a large majority of countries have productivity levels in a relatively narrow range. The productivity levels in financial and business services of non-OECD countries are considerably more heterogeneous. In the OECD area, density distribution functions are clearly flatter in all sector categories – in other words, productivity levels are more unevenly distributed than in non-OECD countries.
6. A snapshot of total factor productivity improvements in the BRIICs and the OECD between 2002 and 2007 leads to the same conclusion (see Annex Figure 4.A1.3).

7. Brazil had large current account deficits financed by capital account surpluses at the end of the 1990s, which became problematic as investors grew more risk-averse to emerging market exposure after the 1994 economic crisis in Mexico, the Asian financial crisis of 1997, and the Russian bond default in 1998. Furthermore, the debt default in Argentina in 2001 triggered a renewed deceleration of the Brazilian economy at the beginning of the 2000s. These extraordinary market conditions may have triggered the "seeming" drop in productivity in real estate, financial, and telecommunications services.
8. Productivity growth is calculated for the period 2002-07 rather than 2002-09 in order to avoid crisis-related biases.
9. Total factor productivity (TFP) growth is based on the three inputs: labour, capital and intermediates. The estimate is based on sectoral data, which include interaction terms between the three input variables (in logs) and sector dummies to account for differences in the production function of different sectors.
10. Recognising that firms are interested in increasing their market shares and profits, technical efficiency is defined here as the relative efficiency of firms in maximising these outputs subject to labour, intermediate input and capital costs.
11. Due to limited or no observations, mark-up figures in the advertising sector are not available for other countries.
12. Services trade restrictiveness is based on the World Bank's Services Trade Restrictiveness Index (STRI), which measures the overall restrictiveness of the services trade as it effects market entry, operations, and regulations. The OECD has also developed a STRI, but it is currently only available for OECD member countries and therefore not used in this chapter.
13. Highly skilled is defined as having attained at least a first stage of tertiary education (Erumban et al., 2012).
14. An exception is India, where intensity of high skills is high and productivity is low. According to reports by the National Association of Software and Services Companies in India (NASSCOM, 2013), an average employee at an Indian IT company spends not all of the actually reported working time on productive activities, which could partly explain this pattern.

References

AmCham China (2012), "2012 American Business in China White Paper", AmCham China, Beijing.

Andersson, A. and A. Groenlund (2009), "A conceptual framework for e-learning in developing countries: a critical review of research challenges", *Electronic Journal of Information Systems in Developing Countries* (EJISDC), Vol. 38, No. 8, pp. 1-16.

Arnold, J., B. Javorcik and M. Lipscomb (2010), "Services Reform and Manufacturing Performance: Evidence from India", *Policy Research Working Papers*, World Bank, Washington, DC.

Baumol, W. (1985), "Productivity policy and the service sector", in R. Inman (ed.), *Managing the service economy: prospects and problems*, Cambridge University Press.

Baumol, W. (1967), "Macroeconomics of unbalanced growth: the anatomy of urban crisis", *American Economic Review, Vol. 57, No. 3*, pp. 415-426.

Bartelsman, E., J. Haltiwanger and S. Scarpetta (2013), "Cross-country differences in productivity: the role of allocation and selection", *American Economic Review*, *Vol. 103, No. 1*, pp. 305-334.

Bauza, V. and M.C. Nash (2013), "IFC provides $6 million for Banco Delta S.A to expand access to finance for Panama's micro and small business entrepreneurs", International Finance Corporation, World Bank Group, Washington, DC.

Bhagwati, J.N. (1984), "The Splintering and Disembodiment of Services and Developing Nations", *World Economy*, Vol. 7, Issue 2, pp. 133-144, June.

Bosker, M. and H. Garretsen (2010), "New economic geography and services", in E. Ghani (ed.), *The Service Revolution in South Asia*, Oxford University Press.

Bosworth, B., S. Collins and A. Virmani (2007), "Sources of Growth in the Indian Economy", *Working Paper*, No. 12901, National Bureau of Economic Research.

Bottini, N. and M. Molnar (2010), "How large are competitive pressures in services markets? Estimation of mark-ups for selected OECD countries", *OECD Journal: Economic Studies*, OECD, Paris.

Cattaneo, O. et al. (2013), "Joining, upgrading and being competitive in global value chains: strategic framework", *World Bank Policy Research Working Paper*, No. 6406, World Bank, Washington, DC.

Conway, P. and G. Nicoletti (2006), "Product market regulation in non-manufacturing sectors: measurement and highlights", *OECD Economics Department Working Paper* No. 530.

Eichengreen, B. and P. Gupta (2011), "The service sector as India's road to economic growth", *Working Paper*, No. 16757, National Bureau of Economic Research.

Erumban, A. et al. (2012), *World Input-Output Database (WIOD), Socio-economic accounts (SEA): Sources and methods*, WIOD and European Commission.

Evangelista, R., M. Lucchese and V. Meliciani (2013). "Business services, innovation and sectoral growth", *Structural Change and Economic Dynamics*, Vol. 25, 119-132.

Flaaen, A., E. Ghani and S. Mishra (2013), "How to avoid middle income traps? Evidence from Malysia", *World Bank Policy Research Working Paper*, No. 6427, World Bank, Washington, DC.

Garicano, L., C. Lelarge and J. Van Reenen, (2012), "Firm size distortions and the productivity distribution: Evidence from France", mimeographed paper, LSE /CEP/CREST, London and Paris.

Ghani, E. (2010), *The Service Revolution in South Asia*, Oxford University Press,

Ghani, E. and H. Kharas (2010), "Service led growth in South Asia: an overview", in E. Ghani (ed.), *The Service Revolution in South Asia*, Oxford University Press, India.

Global Trade Alert (2013), *Global trade alert* (database), *www.globaltradealert.org*.

Hoffmann, S. and B. Lannes (2013), "China's e-commerce prize", Bain & Company.

IDE-JETRO and WTO (2011), "Trade patterns and global value chains in East Asia: From trade in goods to trade in tasks", World Trade Organisation, Geneva.

ILO (2013), *Key Indicators of the Labour Market (KILM)* (database), *www.ilo.org/empelm/what/WCMS_114240/*, International Labour Organisation.

IMF (2013), "Panama, Staff Report for the 2012 Article IV consultation", *IMF Country Report No. 13/88*. International Monetary Fund, Washington, DC.

IMF (2005), "Singapore: Selected Issues", *IMF Country Report No. 05/140*, International Monetary Fund, Washington, DC, April.

Jankowska, A., A. Nagengast, and J. R. Perea (2012), "The product space and the middle-income trap: Comparing Asian and Latin American experiences", *OECD Development Centre Working Paper* No. 311, April.

Kaldor, N. (1967), *Strategic Factors in Economic Development*, New York, Ithaca.

Lee, H. H. and H. B. Tan, (2006), "Technology transfer, FDI and economic growth in the ASEAN Region", *Journal of the Asia Pacific Economy*, Vol. 11, No. 4.

Meng, J. (2013), "Alibaba plots digital revolution", *China Daily*, accessed on 18 November 2013, *http://usa.chinadaily.com.cn/business/2013-10/18/content_17041729.htm*.

Molnar, M. (2008), "Different regulations, different impacts – what regulations affect trade in telecommunications services?", OECD Experts Meeting on Telecommunication Services.

Molnar, M., K. Tanaka, and M. van Duijn (2008), "Direct and indirect channels for regulation to affect trade in services – the case of business services, construction and telecommunications", OECD Technical Workshop on Trade Barrier Assessment Methodology.

NASSCOM (2013), "Better, faster, smarter: upping productivity intelligently: Sapience Analytics", Emerge Forum NASSCOM, *http://emerge.nasscom.in/better-faster-smarter-upping-productivity-intelligently-sapience-analytics/*.

Net Index (2013), *Net Index* (database), *http://netindex.com*.

OECD (2013), Southeast Asian Economic Outlook 2013: With Perspectives on China and India, OECD Publishing, doi: *http://dx.doi.org/10.1787/saeo-2013-en*.

OECD (2012), Southeast Asian Economic Outlook 2011/12, OECD Publishing. doi: *http://dx.doi.org/10.1787/9789264166882-en*.

OECD (2011), "Fibre access – network developments in the OECD area", Working Party on Communication Infrastructures and Services Policy, OECD, Paris.

OECD (2010a), Perspectives on Global Development 2010: Shifting Wealth, OECD Publishing. doi: *http://dx.doi.org/10.1787/9789264084728-en*.

OECD (2010b), SMEs, Entrepreneurship and Innovation, OECD Studies on SMEs and Entrepreneurship, OECD Publishing, doi: *http://dx.doi.org/10.1787/9789264080355-en*.

Roeger, W. (1995), Can imperfect competition explain the differences between primal and dual productivity measures? Estimates for US manufacturing, *The Journal of Industrial Economics, No.* 55-3.

Sass, M. and K. Kalotay (2012), "Inward FDI in Hungary and its policy context", *Columbia FDI Profiles*, Vale Colombia Center on Sustainable International Investment, *www.vcc.columbia.edu/files/vale/documents/Profiles-_Hungary_IFDI_19_Oct_2012_-_FINAL_0.pdf*.

Schreyer, P. (2001), "The OECD productivity manual: A guide to the measurement of industry-level and aggregate productivity", *International Productivity Monitor*, No. 2, pp. 37-51.

Schwab, K. (2013), *World Competitiveness Report 2012-13*, World Economic Forum, Geneva.

Skolkovo Innovation Centre website, *www.skolkovo.ru/public/en/press/news/item/3440-2013-04-02-15/* or *http://centres.insead.edu/venturecompetiton/archives/25th_bvc/documents/20122Oct_CallforEntry_25thIVC.pdf*.

Sutherland, D. et al. (2007), "Performance Indicators for Public Spending Efficiency in Primary and Secondary Education", *OECD Economics Department Working Papers*, No. 546, OECD Publishing, Paris.

Tanaka, K. and Molnar, M. (2008), "What is different about informal finance? Financing of private firms in China", *Revue économique*, Presses de Sciences-Po, Vol. 59, No. 6, p. 1131-1143.

Taymaz, E. (2002), "Are small firms really less productive? An analysis of productivity differentials and firm dynamics", mimeo, Middle East Technical University, Ankara, Turkey.

Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper* Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

Triplett, J. and L. Bosworth (2008), "The state of data for services productivity measurement in the United States", *International Productivity Monitor*, No. 16, pp. 53-70.

UN (2013), *UN data* (database), United Nations, *http://data.un.org/*.

World Bank (2013a), *Services Trade Restrictions Database (STRI)* (database), *http://iresearch.worldbank.org/servicestrade/*.

World Bank (2013b), *World Development Indicators* (database), World Bank, Washington, DC, *databank.worldbank.org/*.

World Bank (2013c), *Doing Business* (database), *www.doingbusiness.org/*.

World Travel and Tourism Council (2013), *World Travel and Tourism Council* (database), *www.wttc.org/research/economic-data-search-tool/*.

ANNEX 4.A1

Additional figures

Figure 4.A1.1. **Wide variety of service productivity levels across low- and middle-income countries**

StatLink http://dx.doi.org/10.1787/888933058578

Figure 4.A1.2. **Financial and business services are more productive than manufacturing in both OECD and non-OECD countries**

StatLink http://dx.doi.org/10.1787/888933058597

Figure 4.A1.3. **Emerging economies improved total factor productivity in many services at a higher pace than in manufacturing**

StatLink http://dx.doi.org/10.1787/888933058616

Perspectives on Global Development 2014
Boosting Productivity to Meet the Middle-Income Challenge

Chapter 5

Regional policies to enhance competitiveness

This chapter first discusses regional disparities in economic development across some BRIICS countries and other emerging economies, before exploring the drivers of regional competitive advantages and the policy options and strategies for activating them. Economic development tends to be accompanied by uneven growth between regions, as early drivers of growth may be geographically concentrated and connections within a country may be underdeveloped. Widespread convergence in regional income is not seen in many emerging economies, but there is some evidence that convergence in productivity is underway. Regional disparities are widely considered to lock developing countries in relative income stagnation. In addition to nation-wide policies, regional policies to support overall national objectives of stronger, more equitable and greener economic growth are needed.

Amid inequalities across regions that tend to be relatively high and often persistent in developing countries, a *status quo* of unchanged national and/or regional policies is widely considered to lock such countries in relative income stagnation. Therefore, in addition to nation-wide policies, a redesign of regional policies to support overall national objectives of stronger, fairer and greener economic growth are needed. Among the objectives of a good policy mix at different government levels, the provision of basic services (including, for example, water, electricity and health services) in all regions is crucial. More targeted regional policies, additionally, can aim at enhancing each region's competitive edge.

The policy environment at the sub-national level may be as, if not more, important than that established by central government. The wrong choice of regional policies may frustrate efforts to boost competitiveness at national level, particularly in countries with decentralised public finance systems and civil services. If service delivery is delegated to a government level that cannot cope with externalities, let alone capacity constraints, productivity and efficiency growth are likely to suffer. Well-designed regional policies that encourage the development of local strengths can, on the other hand, lead to enhanced growth.

This chapter addresses the issue of the appropriate regional policies that developing countries could adopt to avoid sustained slowdowns in their convergence process. Is there an efficient policy blend for enhancing regional competitiveness? Will it be sufficient for developing countries where convergence has slowed down to strengthen blanket regional policies or should they place stronger emphasis on policies that target particular places in pursuit of enhanced regional competiveness? The 2011 OECD framework on regional policies provides a platform for addressing these issues in developing countries. A number of valuable policy conclusions flow from the debate and are of direct interest to developing countries. Following OECD's new regional policy approach (Box 5.1), this chapter first discusses regional disparities in economic development across some BRIICS countries and other emerging economies, before exploring the drivers of regional competitive advantages and the policy options and strategies for activating them.

Box 5.1. **Towards a place-based (rather than place-blind) regional policy approach**

The global financial crisis has set in train a keen search for a new development model which might serve the three-fold goal of increased efficiency, reduced inequality, and environmental sustainability. In this context, the OECD developed an agenda for stronger, cleaner, and fairer economic growth. While past discussions centred on trade-offs between different objectives, the new policy debate has focused on pursuing the three policy objectives in a more balanced and complementary way. For example, social policies should not address social cohesion only, but could also seek to increase economic efficiency through trust and greater security. Similarly, well-designed economic policies may not only lead to sustained growth, but also contribute to a greener economy (OECD, 2011a).

Box 5.1. **Towards a place-based (rather than place-blind) regional policy approach** *(cont.)*

Addressing environment- and equity-related concerns in parity with growth targets as distinct from viewing them as secondary goals has led policy makers to also envisage a new place-based policy approach for regions. This approach takes into account the specific conditions of each type of region, so revealing potential complementarities among the three principal objectives. It seeks to identify and harness local strengths and assets as main instruments for stimulating regional development – in sharp contrast to conventional types of policies, which were compensatory, sectoral and spatially blind (i.e. the same across all regions).

OECD governments started to apply the new regional policy paradigm at the beginning of the last decade. Retreating from the traditional sector-specific approach, which focused on subsidies for lagging regions, they began to place regional economic performance in a holistic, multi-dimensional perspective. One illustration was the decision in 2009 by United States President Barack Obama to initiate an inter-agency process focused on evaluating existing place-based policies and identifying areas for inter-agency co-ordination. The European Commission's 5th Cohesion Report in 2010 announced a similar shift towards the new paradigm.*

Adopting such a differentiated approach, though, is not easy, as the three dimensions of societal progress (efficiency, environmental quality, and social equity) are disconnected in space (OECD, 2011a). In the past, people would leave low-income areas attracted by higher incomes, job opportunities, and better public goods (healthcare and education) in large cities. Very often, however, the benefits of such moves were weakened or even reversed by negative, non-market effects in metropolitan areas. Moving to large cities often involves "costs" related to congestion, reduced environment quality, high criminality, and looser contacts with the local community.

Such spatial trade-offs were once widely accepted as people voted with their feet when choosing different spatial locations. The current OECD debate about a new development model, though, suggests that rising numbers of people are now demanding greener, more liveable cities and a minimum standard of employment opportunities and public goods in rural and intermediate areas. This points to a structural weakening of acceptance of trade-offs.

The closer attention being paid to the regional dimension of economic policy has also been associated with recent cyclical downturns which, in many countries, have been highly concentrated geographically. Given the disproportionate impact of the economic crisis, policy makers began to consider that policies more attuned to the specific needs of regions could accelerate economic recovery in the short run and yield sustained output growth in the longer run. Struggling to reignite growth amid severe fiscal restraint, governments have explored new avenues for maximising the growth-enhancing potential of public expenditure.

* The policy conclusion in support of place-differentiated, or place-based, policies is not universally accepted. Some participants in the on-going OECD policy debate still take issue with it. In their view, a place-blind development model works best for achieving growth results in regions. The advocates of place-blind policies recognise that spatial structure interacts with industrial structure to determine the location of firms as the new economic geography argues. Nevertheless, they consider that such spontaneous interactions still create no rationale for place-based policies. In line with this reasoning, World Bank's World Development Report 2009, *Reshaping Economic Geography*, contends that such policies are fundamentally "misguided" and that prosperity will not come to every place at once and may not come at all to some places.

Diverging regional performance in the BRIICS and other emerging economies

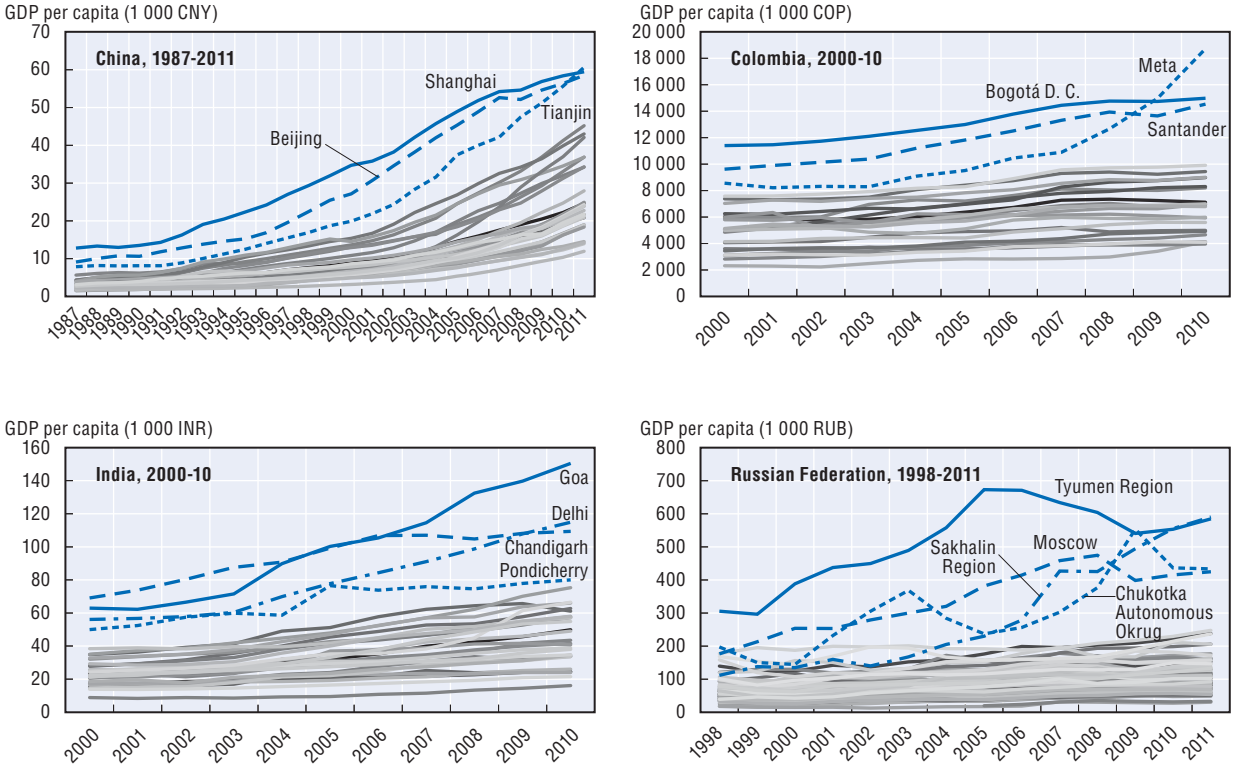
Economic development tends to be accompanied by uneven growth between regions, as early drivers of growth may be geographically concentrated and connections within a country may be underdeveloped. Although differing rates of capacity utilisation and structural transformation contribute to income gaps, sustained convergence needs to be driven by improved competitiveness both in all regions and at national level. Importantly, while widespread convergence in regional income is not seen in the emerging economies studied here, there is more evidence of convergence in productivity.

Regional income disparities remain high and sometimes increase with growth

Country-wide growth in GDP per capita in the People's Republic of China, Colombia, India, and the Russian Federation has been accompanied by growing incomes at the regional level (Figure 5.1). A particular trend is that in those countries income disparities between a small number of wealthier regions and the rest widened. In China, the three wealthiest regions in 1987 (Shanghai, Beijing and Tianjin) also had the highest incomes in 2011, above those of a group of another seven high-income regions. Although income rankings remained largely unchanged over these 24 years, with some poorer regions growing more slowly than the national average, other lagging regions, like Sichuan, had among the highest growth rates. In Colombia, there was a noticeable gap in per capita GDP

Figure 5.1. **Regional income levels are diverging in some emerging economies**

GDP per capita by region over various periods in 2005 local prices



Note: GDP adjusted to 2005 local prices using national deflators.

Sources: National Bureau of Statistics (China), National Statistics Office (Colombia), Directorate of Economics Statistics of respective State Governments (India), Russian Federation Federal State Statistics Service.

StatLink http://dx.doi.org/10.1787/888933058635

from 2000-10 – which widened sharply from 2007 – between Bogota, Santander, and Meta and the rest of the country, where growth remained sluggish over the same period. Goa, Delhi, and Chandigarh remained the highest-income regions in India from 2000-10 and poorer regions showed little sign of converging – a scenario that also applied to the Russian Federation, where growth was highest in the wealthy Sakhalin region. Although country-wide convergence has not been apparent in these four countries, a number of previously lagging regions in each did grow considerably.

Some regional disparities are driven by the economic expansion of small regions. Further considerably contributing to apparently widening inter-regional gaps are relatively wealthy, fast-growing major urban centres, such as Tianjin, Shanghai and Beijing in China, Bogota in Colombia, Delhi in India, and Moscow in the Russian Federation. Similarly, regions like Goa in India, which have small populations and specialise in particular industries, e.g. tourism or extraction, may have much higher GDP per capita than the national average.

In the literature on economic geography, the absence of regional convergence dynamics is mainly ascribed to the dividends from large urban agglomerations (Krugman, 1991). They flow from various factors: economies of scale, labour-market pooling, forward and backward linkages, network effects, knowledge spillovers, and other internal and external economies that firms exploit through the geographical concentration of economic activity. Such benefits may, at least initially, make for a widening of regional income differentials.

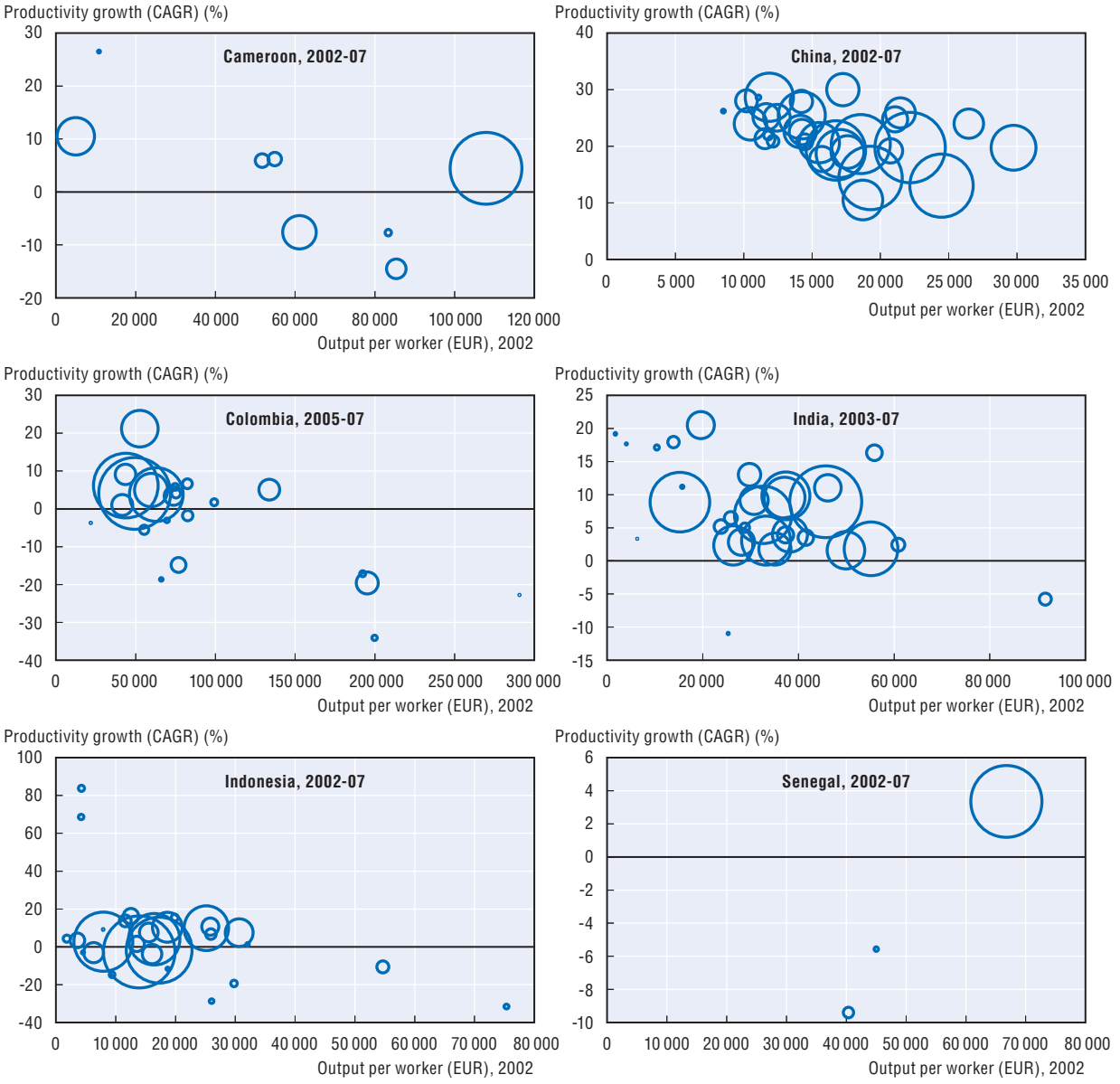
Productivity in lagging regions has recently started to catch up in some countries

Positive agglomeration effects may also be visible in the high (manufacturing) productivity levels in large urban areas compared to those in regions with smaller economy activity. Despite these significant regional productivity inequalities, low-productivity, lagging regions are gradually catching up in several countries (Figure 5.2). This convergence is most clearly seen in China. Among the regions with the highest manufacturing productivity growth in 2002-07 were the low-productivity regions of Henan, Hainan, Gansu and Inner Mongolia, all of which grew by an annual average of over 25% over that period. This may be related to China's Western Development Strategy initiated in 2000 that, among other goals, aims at fostering competitiveness in lagging provinces (see Box 5.5). Similarly, convergence in productivity across regions in Colombia and India was plain to see and could eventually result in poorer regions closing their income gaps with the rest. In Cameroon, Indonesia and Senegal, convergence in productivity was not observed during the periods under study. However, given the small number of regions in the sample (at least in Cameroon and Senegal), a clear convergence picture across regions was in any case less discernible in the three countries.

Improving productivity in regions with lagging incomes will accelerate growth that reduces within-country differences in GDP per capita and fuels rising employment in higher-productivity industries, which will, in turn, further raise incomes. Future policies to support regional competitiveness should be shaped to recognise regional differences in growth opportunities. Designing and implementing such policies requires an *a priori* understanding of all the potentially important factors that give different regions their competitive edge.

Figure 5.2. **Regional productivity levels are converging in some countries**

Output per worker and compound annual growth over various periods, by region



Notes: The size of the bubble represents the share of national manufacturing employment in the region in the first period. Labour productivity was calculated as output per worker, deflated to 2002 local prices and converted to euros using the average of the 2002 to 2007 exchange rate. CAGR stands for compound annual growth rate.

Source: Authors' calculations using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058654

Factors that give regions a competitive edge

Every region has its own competitive advantages and should exploit them to drive productivity growth. They are multi-faceted, however: in other words, there is no single characteristic that is true of any one region and determines its relative competitive stance.

Market and non-market factors drive regional competitive edges

A region's capacity to be competitive within a country and worldwide is determined by an interplay of factors:

- geographical endowments, e.g. natural resources, coastal proximity, culture, ethnicity;
- outcomes of market dynamics, e.g. downward and upward linkages, spillovers, better connectivity with the outside world, lower transportation costs due to proximity between suppliers and consumers;
- externalities, e.g. congestion and pollution;
- local governance.

Productive firms exploit their region's advantages to gain a competitive edge and reach levels of productivity comparable to their country's top performers, regardless of where they are located.

Although endowments appear to drive competitive advantages, they do not entirely predetermine economic success. Competitiveness is, however, path dependent; previous market and non-market dynamics are endogenous to a region's short- and medium-run competitive advantage, which is where its growth potential lies (Storper, 1997). An urban region, for example, in which a strong high-tech industry has emerged, is likely to sustain and expand its high-tech competitive advantage when market mechanisms are at play (e.g. increasingly important spillover effects) and negative non-market externalities (e.g. pollution or political crisis) do not destroy that advantage.

Furthermore, public investment spending on infrastructure, human capital accumulation, and social issues are often biased towards large and capital cities (Kim, 2011). Often, such primacy springs not from the market or trade, but from political and institutional factors that favour specific urban regions (Duranton, 2008; Davis and Henderson, 2003). This non-market dynamic leads to agglomerations enjoying an ever-increasing competitive advantage more rural areas, as firms have better access to specific skills and can benefit from high quality infrastructure.

Excessive agglomeration, however, may give rise not only to negative externalities but to social exclusion in urban areas which could, in turn, weaken their competitive stance relative to less heavily populated regions (Henderson, 2009; 2010). Furthermore, granting certain regions and cities overly favourable fiscal allocations could widen the inequality gap between people in the beneficiary regions and those in the rest of the country. The upshot may be social disquiet. Balancing the benefits and costs from urbanisation, particularly in the long term, is crucial to the competitive advantages of urban areas themselves and to those of countries as a whole.

Economic development processes are highly localised. Every region in a country has its own competitive advantage to contribute to the wider economy. However, path dependency may be the reason for unequal growth dynamics across regions. A less developed rural region, for example, may today be well-equipped to produce agricultural products. Yet, it can only evolve into a more industrialised or service-providing region once it has accumulated the necessary physical and human capital. And, as agriculturally based economies or regions typically grow more slowly than newly industrialised ones, it may achieve higher growth only in the medium to long term. For example, Thailand's south-eastern provinces today enjoy a competitive advantage through the production of agricultural products such as rice and fruits. But they can secure higher growth – like that

of the metropolitan region of Bangkok which has become a hub of the global supply chain in the automotive and other high-tech industries – only once they have the necessary infrastructure and human capital (and other requirements) in place.

Large-scale investment in infrastructure and generous incentives to enterprises to move to lagging or less dynamic regions do not alone necessarily make such places more prosperous. Such effects were expected by place-blind regional development models – in eastern Germany after unification, for example, or in south Italy between 1955 and 1993. However, they failed to take competitive advantages into consideration in their attempts to develop certain sectors in lagging regions (Gill, 2011).

Rather than trying to spread economic activity blindly without basing it on relative competitive advantages, countries should seek to foster interaction between prosperous and laggard regions. In particular, migration between regions should not be curbed. Labour mobility can be an important source of productivity growth in low- and middle-income countries, but is often restricted by registration systems or the non-portability of social security benefits, as under China's *hukou* system of household registration.

The absence of a single domestic market and the segmentation of labour markets can also inhibit the efforts of lagging regions to converge. Protectionist barriers to the free movement of goods across regions, for instance, whether anchored in central or sub-central government regulations or erected in an ad hoc manner, may hinder the exploitation of regional competitive advantages in various ways. It may push up prices since it precludes any exploitation of cost advantages. And it may curb investment in heavily regulated activities and thus further reduce regional competitiveness.

Finally, closer interaction between wealthy and less wealthy regions also requires that access to high-quality basic education and healthcare services as well as the development of basic infrastructure should be independent of place.

As discussed in further detail below, programmes for specific skill and infrastructure development as well as for other public goods and services should be determined according to existing competitive advantages. Since these may vary and be path-dependent under the place-based regional policy approach, countries should seek to provide different bundles of public goods and services to localities with different needs at a specific point in time.

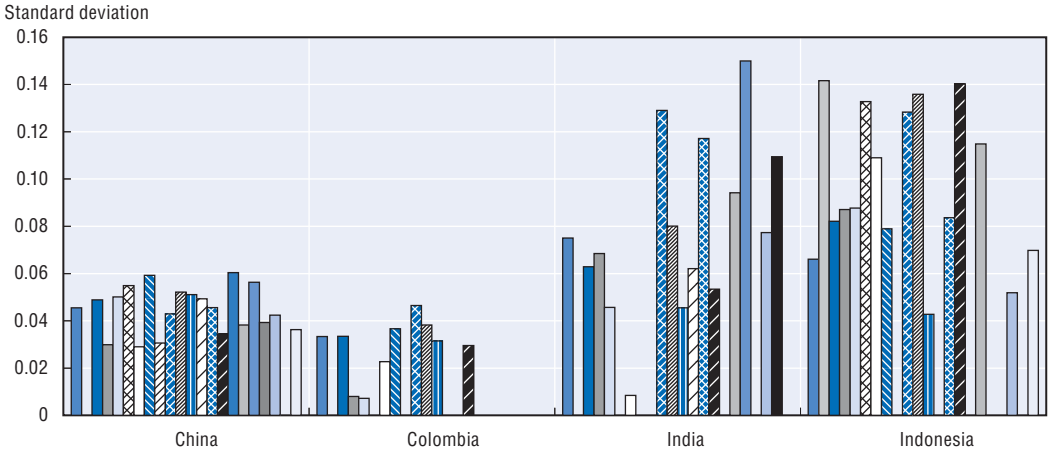
Competitive firms can emerge in any region

Productivity convergence may be slowed by factors like an inappropriate regulatory environment, poor infrastructure, and insufficient skill levels in lagging regions. Yet, even disadvantageous regional conditions can be surmounted by successful firms that go on to reach high levels of productivity. There does not have to be a high degree of region-wide industry specialisation for companies to gain a competitive edge, as single industries or even small groups of high-productivity firms can specialise to a level which gives that edge.

Technical efficiency varies considerably across industries within regions as well as across regions (Tables 5.A1.1-5.A1.4). Regional differences in firms' performances relative to the frontier defined by the most efficient producers are narrowest among Chinese and Colombian regions. Most of the relative differences in efficiency appear to happen within, rather than across, regions (Figure 5.3). At the other extreme, there is great mix of technical efficiency levels among Indian and Indonesian regions.

Figure 5.3. **Regional variance in efficiency is relatively low in China and Colombia**

Standard deviation of average regional technical efficiency in manufacturing industries, 2007



Notes: Theta measures one minus the distance of each firm to the efficiency frontier, estimated within each country and industry (2-digit ISIC Rev.3). Regional averages were calculated by weighting firm-specific thetas by firm shares of regional output to create region and industry averages. The figure presents the standard deviation of these results across regions, by industry. Each bar represents one industry in the respective country.

Source: Authors' calculations using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058673

Regional factors contribute relatively little to productivity differences across manufacturing firms in China, Colombia, India and Indonesia (Figure 5.A1.1). They account for less than 20% of labour productivity differences (with some exceptions for firms in particular age groups). Most of the productivity inequality in the four countries seems attributable to factors within regions (which includes factors specific to the firms themselves).

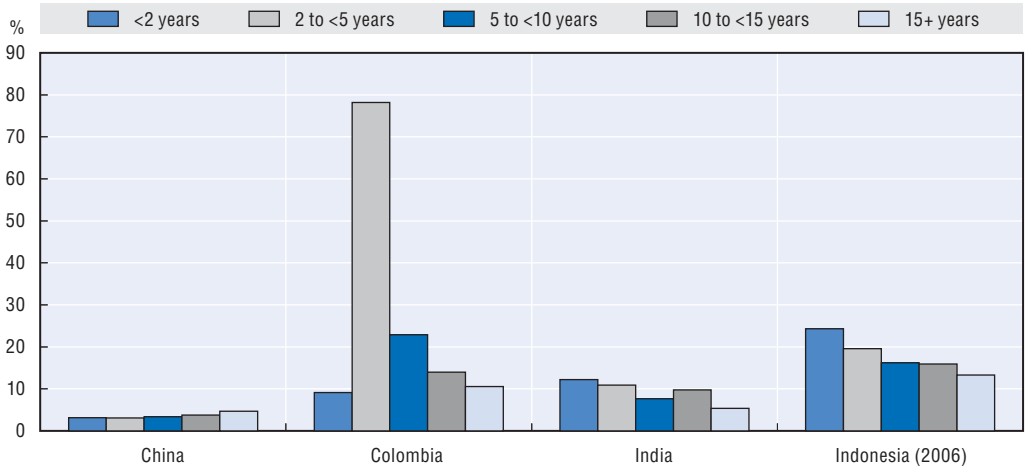
Location is often more relevant for younger firms

When region-specific factors do determine productivity, however, they seem to be connected to the age of companies in some countries. On average, regional differences impinge on younger firms after their first two years of business (Figure 5.4 and Tables 5.A1.5-5.A1.10). The trend is not observed in all countries, however. Although regional factors are generally less decisive in China, they have the greatest impact in firms that have been operating for 15 years or more. In fact, it may not only be for young firms but for new firms, too, that location affects productivity. New firms that are less than two years old are very heterogeneous: there are those that will grow quickly and those that will soon fail, which produces high overall productivity disparities that may obscure regional differences. In all countries studied, productivity inequalities were highest among firms under two years old. After young firms develop past this point, the region in which they do business may become a more important component of productivity differences as policy environments, agglomeration effects, or local demand affect them in different ways according to their age.

Differences in policy, agglomeration effects, and local demand can all affect the productivity of a firm differently according to its age. China, Colombia, India, and Indonesia all have region-specific policies that are likely to drive some of the productivity differences observed. For example, policies to encourage entrepreneurship and offer financial and information-based support to new and younger firms are likely to produce significant productivity differences between regions. Policies that foster competition, entrepreneurship, and appropriate skills are therefore important in all regions.

Figure 5.4. **Regional factors may be more important among younger firms in driving productivity**

Between-region component as a share of the overall Theil index of manufacturing labour productivity by firm age, 2007



Source: Authors' calculations, using national firm-level datasets.

StatLink http://dx.doi.org/10.1787/888933058692

The benefits of network and agglomeration effects at the regional and local levels in reducing production costs may also have a greater effect on younger firms. Knowledge spillovers from nearby firms can be a particularly influential factor among younger businesses as they develop their internal capacities for innovation, particularly in high-tech industries. Similarly, new companies may prefer to position themselves near those sources of knowledge to reduce risk (Audretsch, 1998). Demand effects may also play a role as younger firms are more likely to focus on local markets, which may depress the earnings of firms in lower-income regions. The possible influence of these various regional factors highlights the benefits of creating policy environments conducive to entrepreneurship and ensuring that there are no barriers to interregional flows of output or labour and other factors of production.

Specialisation and agglomeration are important factors in regional performance

Regions with large manufacturing sectors and those that are more specialised in particular industries may be more productive. Although the former may be expected to be more productive due to external economies of scale in the provision of infrastructure or the benefits of access to large pools of experienced labour, the evidence as to the advantages of sector-wide economies of scale is mixed. The relationship between the scale of the manufacturing sector by region and the productivity of particular industries varies by country (Figures 5.A1.3-5.A1.8). In China and India, manufacturing productivity tends to be higher in regions with large manufacturing sectors such as Maharashtra. It had the largest workforce and the third most productive manufacturing sector in India in 2007. A similar trend is seen between Chinese cities, as Box 5.2 illustrates. In Cameroon and Senegal, too, productivity is highest regions with the most manufacturing workers. The relationship is negative in Indonesia and Colombia: Bogota is home to more manufacturing workers than any other region, but only had the 15th-highest productivity out of 22 regions.

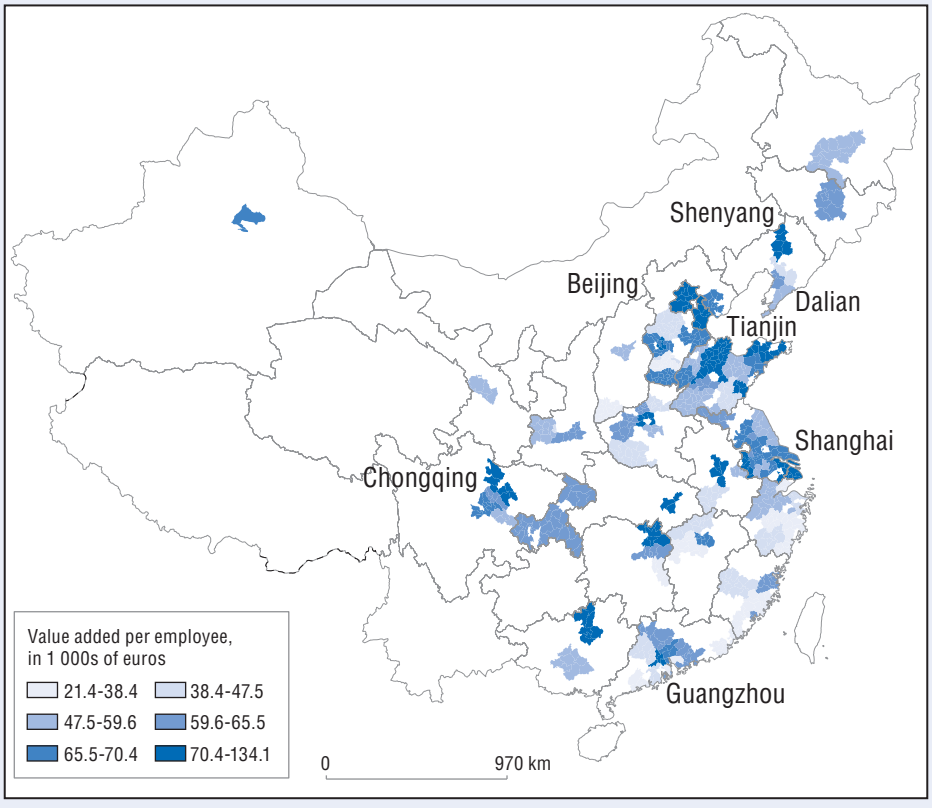
Box 5.2. **Productivity varies by region among China's manufacturing clusters**

Trends in the clustering of manufacturing activity and productivity are clearer when studied at the local level in China, where firm data categorised by city were available. The bulk of manufacturing activity in 2009 (80% of manufacturing employment) was in cities that have been selected as Special Economic Zones at an early stage of economic development based on their geographic location, i.e. coastal proximity (also see Box 5.5). Groups of high-productivity cities are most apparent around Shanghai, as well as in Beijing and Tianjin and in the surrounding provinces. Although a considerable share of manufacturing employment is concentrated around Guangzhou in the south-east of the country, there appears to be less concentration of high-productivity cities in these regions. Accordingly, concentrated manufacturing is not the only factor determining productivity.

So far, only a few Chinese cities in western provinces remerged as important employers in the manufacturing sector. Three exceptions may be clusters in Chongqing, Gansu and Xinjiang provinces. Among other western provinces, these three benefited from extensive fiscal support through the Western Development Strategy initiated in 2000 (see Box 5.5). Chongqing and Xinjiang provinces now have cities where average manufacturers are among the most productive in China (figure).

Productivity is highest in clusters around Shanghai, Beijing and Tianjin

Value added per worker in manufacturing in China's 100 largest manufacturing cities, 2009



Note: The 100 largest manufacturing cities, by employment, together account for more than 80% of all manufacturing employment in China.
Source: Map created with C & D – © Artique. Authors' calculations using national firm-level dataset.

The benefits of regional specialisation and industry scale can also exist within particular manufacturing industries. In 6 of Colombia's 22 regions and in 6 of the 25 regions in Indonesia for which data were available, the largest sector by employment is also the most productive. These sectors – most commonly food and beverage – account for an average manufacturing employment share of 80% in Colombia and 48% in Indonesia (Table 5.A1.10). The largest sector is not the most productive in the vast majority of Chinese and Indian regions, though some high-productivity industries employ very high shares of the manufacturing workforce. Motor vehicle manufacturing in Jilin province in China, for example, employs 22% of manufacturing workers. The largest industry contributions to manufacturing output growth come from both high-productivity and high-employment industries in these dynamic economies.

Top-performing firms can be found in most regions

While regional factors appear to affect the performance of highly productive firms, just as they do the rest of the economy, there do not appear to be significant location-based barriers to the development of high productivity firms in some countries (Tables 5.A1.11-5.A1.16). This is most obvious in China where, in every region, at least 0.15% of firms are in the top percentile of country-wide labour productivity. Regional equity among high-productivity firms is less pronounced in the other countries studied here, though firms in the top 5% nationally come from 32 of 33 Indonesian, 31 of 33 Indian, and 21 of 23 Colombian regions. Many companies are able to thrive regardless of their location, presumably due to internal factors, such as good management, suitable equipment, and skilled workers.

Activating regions' competitive edges

A main feature of the place-based regional development model is how policies target the competitive advantages of a country's different regions. This is in sharp contrast to the place-blind model that treats all regions homogenously and disregards comparative regional advantages. This section investigates the appropriate channels for revealing competitive regional advantages so as to leverage their growth potential. It considers not only aspects of economic competitiveness, but also the social and environmental factors which may support a region's medium- and long-term advantages and lead to a sustained development path. Also discussed is how countries may use selected policy areas to activate regions' competitive edges.

Multi-level governance can improve efficiency and equity in service delivery

A region's competitive advantage and growth potential should be assessed through a collaborative, intangible infrastructure (such as a forum), which allows all local development stakeholders (including the private sector) and regional and central government bodies to work together in pursuit of the best local development programmes. Such assessment goes beyond the traditional distinction between top-down and bottom-up approaches. Based on a region's competitive edge, regional policies to target public investment in both physical and soft infrastructure should depend on clear multi-level governance in which each level and each actor contributes to the vision, the design and, ultimately, the implementation of policies (OECD, 2009a).

Vertical and horizontal consultations transcend habitual lines of demarcation

For place-based policies to be successful, local and regional actors need to be mobilised as an essential part of policy design. Principal-agent problems and rent seeking by policy beneficiaries can be broadly avoided in this way. What is more, lower tiers of government are better placed to know where the investment priorities lie within their territories and to involve private-sector actors in regional development. They should also be empowered with the capacity to design and implement strategies that recognise the local cultural and socio-institutional underpinnings of regional economic interactions and behaviour. Central governments are best placed to decide on national development strategies and should also be involved in co-ordinating policies and ensuring that local actors' room for manoeuvre is restricted to the boundaries drawn up by national principles and the development strategy.

Multi-level governance should address the full range of potential areas of public investment: the provision of infrastructure and public goods, human capital formation and mobility, and the business environment and innovation. In each policy area, one or more different constructs of multi-level governance co-ordination may turn out to be optimal. In other words, the place-based approach entails multi-level policy governance that performs the following three tasks:

- **It commits local elites to tailor-made institutional changes and public investments which are coherent with the general principles as stated by a central government body.** Through consultation local elites represent the views of such stakeholders as local government, the private sector, and civil society. The central government body can define the scope of the provision of a public good like electricity or water. With respect to electricity, for example, it may define the scope of access in terms of prices that are affordable by all groups of society. The local elites would then debate on how to put in place that scope in their region, be it through the construction of renewable or non-renewable energy plants or electricity imports.
- **It creates room for an in-depth public debate, where individuals and groups inside and outside established elites have a chance to voice ideas and dissent and promote innovation.** While such debates may slow down the political process, they make decision-making more inclusive, avert social exclusion, and are likely to result in development that is more sustainable and takes social considerations into account. For example, if the local elites of a metropolitan area identify computer-related activities such as software development as a strategic sector (as has happened in Hyderabad in India) and agree that city-centre clusters could enhance competitiveness, some residents may have to be moved. In such an event, the multi-level governance process could avert social disquiet and exclusion by giving those affected the chance to voice their viewpoint and stand up for their own interests.
- **It introduces a system of monitoring and evaluation based on generally agreed-upon outcome indicators** (Barca, 2011). Such a system sustains and sharpens the focus of public debate. Outcome indicators are needed to measure both socio-economic progress and the difference between *ex ante* aims and policy results. Outcome indicators may be specific to local circumstances or represent national interests by benchmarking regions against each other. With respect to human capital development, some countries' public investment in vocational and technical training may be specific to a region's needs. In that event, a regional government body should set the outcome indicators for evaluating the success of such investments, with a possible indicator being productivity growth in sectors that benefit from the skills taught. By contrast, public investment in basic education should be allocated as

part of an effort to attain national standards. Although local bodies could finance, design, and implement such investment, outcomes should be assessed on nationally agreed principles. For that purpose, the Programme for International Student Assessment (PISA) would be one option for regional comparisons of the quality of basic education and the underlying public expenditure. Independent of the tier of government at which outcome indicators are set, the monitoring work and post-evaluation investigations (in the event of outcome targets not being met) should be conducted by lower-level government bodies, with the target-setting institution possibly playing only a co-ordinating role.

Identifying and implementing an appropriate design for regional development plans based on regions' competitive advantages requires a set of horizontal and vertical tailor-made arrangements that transcend habitual lines of demarcation between local, regional, and national government.

An additional requirement for successful place-differentiated polices is conditionality (ibid.). Conditionality should be understood as binding agreements that govern the relationships between the different levels of governance, policy makers, and other stakeholders. Assigning transparent, explicit roles to each tier of government in a specific policy area averts conflict and efficiency loss during the political process. Good multi-level governance in identifying and fostering regional competitive advantages is crucial to all regions realising their economic potential (Storper, 1997).

Equity and efficiency should be balanced when designing and implementing multi-level governance

The design of a multi-level governance structure should take subsidiarity as its organising principle, stating that a matter ought to be handled by the lowest, or least centralised, tier of government capable of addressing externalities effectively. Central government should therefore have a subsidiary function, performing only those tasks which cannot be carried out effectively at a more immediate or local level. More practically, any multi-level government design should balance efficiency and equity when identifying regions' economic strengths and account for initial disparities and inefficiencies. Under these circumstances, the implementation of a multi-level governance framework could in fact lead to more or less decentralisation in policy mandates (which include those for public spending and revenue raising).

With respect to efficiency, decentralisation may in fact lead to:

- more efficient allocation of resources to meet regional demands for public goods and services,
- more creatively and innovatively designed development policies to benefit from (sometimes hidden) competitive advantages,
- more accountable and transparent regional decision-making to reduce corruption and increase trust.

Care should be taken, however, to avoid any mismatch between regional resources and authorities. For example, in countries where devolved spending powers are greater than devolved resources, regions are often dependent on external financing such as national transfers or bank loans. The upshot may be a problem of moral hazard, where regions overspend and accumulate huge debts safe in the knowledge that central government will bail them out (Box 5.3). There is also evidence that spending can be more wasteful if the government does not need to bear the marginal social costs of raising revenues to finance

it. Furthermore, national governments may be more efficient in providing certain goods and services since they can make use of economies of scale and scope (Prud'homme, 1995). Decentralisation only increases efficiency, therefore, if regions have sufficiently large economies and populations to provide public goods and services. A final point is that the design of multi-level governance should ensure that the competencies of different tiers of government do not overlap.

Box 5.3. **Decentralisation in Mexico – what can be learnt?**

Although Mexico has always been a constitutionally federal country, central government has long been the core decision-maker. A shift towards greater decentralisation begun in the 1980s as part of an effort to maintain political stability after the debt crisis of 1982. Under President Zedillo (1994-2000), decentralisation gained further importance in the New Federalism agenda that sought to increase the transfer of resources and authority to sub-national levels of government.

Decentralisation in Mexico has made many aspects of the political process more efficient and even led to policy innovations in some regions, which other regions later adopted. For instance, regions such as Chiapas and Jalisco have instituted modern budgetary and payment systems which simplify the registration and control of financial operations and reduce scope for corruption. Chiapas and Sonora have created a very transparent system of teacher selection. In the context of a comprehensive strategy of local sustainable development, Jalisco adopted innovative solutions such as support centres for SMEs and incentives for niche productions. Furthermore, service provision in rural and remote areas is increasingly based on consultation between different levels of government and civil society, so allowing better informed policy designs and avoiding *ex post* discontent among affected groups in society.

Rising debt in most Mexican states is the result of deep-seated imbalances between regional revenues and expenditures combined with generally weak fiscal discipline. Regions are allowed to borrow from banks without major restrictions and have very limited tax-raising powers. In fact, states use taxation to raise less than 10% of their revenues, the bulk of which comes from government transfers, as the figure in this box shows. States' poor fiscal discipline, together with their tacit understanding that they will be supported by federal transfers (an understanding strengthened by the extraordinary 1995 federal bailout of Mexican states after the peso crisis), has created a situation of moral hazard that leads sub-national governments to overborrow. The recently adopted reform limiting excessive borrowing by states and boosting their ability to collect taxes will make fiscal federalism within Mexico's multi-level governance system more efficient and eventually lead to lower debt.

Although the gaps between regions' per capita GDP has widened with increased decentralisation, one of the most important factors in growing regional disparities has probably been the process of trade liberalisation in Mexico. The country switched from an import-substitution strategy to the GATT regime and then to the North American Free Trade Area (NAFTA), which was particularly beneficial for regions on the border with the United States. Nevertheless, the gap between rich and poor states may also have been perpetuated through so-called earmarked grants which have been traditionally biased in favour of richer states. The grants are regulated by central government which then transfers them to sub-national governments – mainly for education and healthcare programmes. This example shows that although central government support for a more equitable education and healthcare system across the regions should be welcomed in a multi-level government system, Mexico's allocation of earmarked grants to richer states is probably driven by economic or political economy factors.

Box 5.3. **Decentralisation in Mexico – what can be learnt?** *(cont.)*

With regard to multi-level governance in place-based approaches to regional development, the Mexican case shows that the overall impact of decentralisation largely depends on how powers and resources are transferred to sub-national governments as well as on the country's specific characteristics. For example, the system of earmarked grants and soft budget constraints are issues directly related to the design and implementation of devolution and to local conditions and not to decentralisation itself. Therefore, designing multi-level governance to identify comparative regional advantages and eventually implement regional policies is fundamental if countries are to gain from the place-based approach.

Locally raised resources are limited in Mexico

Revenue composition at state/regional level by country, 2011

Source: OECD (2013a), *OECD.Stat* (database), *http://dotstat.oecd.org/*.

StatLink http://dx.doi.org/10.1787/888933058711

Sources: Ascani, A., R. Crescenzi and S. Iammarino (2012), "Regional Economic Development: A Review", *SEARCH Working Paper*, WP1/03, January; Hernandez Trillo F., A. Diaz Cayeros, and R. Gamboa Ganzalez, (2002), "Fiscal Decentralization in Mexio: The Bailout Problem", *Research Network Working Paper*, R-447, Latin America Research Network, Inter-American Development Bank; Joumard, I. (2005), "Getting the most out of public sector decentralisation in Mexico", *OECD Economics Department Working Papers*, NO. 453, OECD Publishing, Paris, *http://dx.doi.org/10.1787/881825436538*; Rindebro, U. (2013), "Moody's welcomes reforms aimed at reducing Mexican states' debt burden", *Business New Americas* website, 26 July, *www.bnamericas.com/en/archives/news/26-7-2013*, accessed 5 September 2013.

With respect to equity, a decentralised government structure tends to reduce income inequalities between regions insofar as it allows poorer regions to manage their economic development by identifying and designing their own strategies. Furthermore, a downsized central government lowers concentrations of economic activity around capital cities and spreads it over the whole national territory (Gil Canaleta et al., 2004). Rich regions may always have more bargaining power to attract central government funding, not least as national governments may well find it more beneficial to support the rich in order to secure electoral support and mass media attention. As for efficiency purposes, therefore, and looking at the issue from an equity perspective, strengthening regions' tax collecting powers should go hand in glove with stronger spending and other decision-making powers.

However, although gaps in competitiveness between regions due to scarce physical and human capital and other structural deficiencies should be designed into multi-level governance structures, lagging regions may in fact be too deficient to raise enough revenues to finance even the most basic public goods and services. In that event, multi-level governance should guarantee that investment in basic needs like education and infrastructure are financed by central government bodies.

Multi-level governance is more effective at meeting local infrastructure needs

Infrastructure projects are typical examples of public service where the principle of subsidiarity is applicable and multi-level governance can make a difference. On the one hand, regional governments are more familiar with the local infrastructure problems and potentials. On the other hand, national institutions usually have more administrative capacity for managing and monitoring complex projects. South Africa has made explicit efforts to establish inter-governmental links in many dimensions of planning and development so that provincial and municipal agencies co-operate in determining priority locations and implementing infrastructure. For example, while state and provincial agencies laid out and managed a regional railway line, municipal and local institutions contributed to planning the micro-infrastructure of stations and their precincts (OECD, 2011a).

Multi-level governance also applies to the question of how to fund regional infrastructure projects. Central governments can directly transfer funds to regional governments, sometimes backed by loans from commercial or designated development banks. South Africa has, for example, established Municipal Infrastructure Investment Units specifically dedicated to the task of managing local infrastructure projects (Estache, 2010). The new royalty system in Colombia enables the financing of infrastructure and other public goods and services in resource-scarce regions (Box 5.4). This standard avenue of funding is most relevant to projects that supply public goods but do not directly generate revenues and to those with heavy externalities.

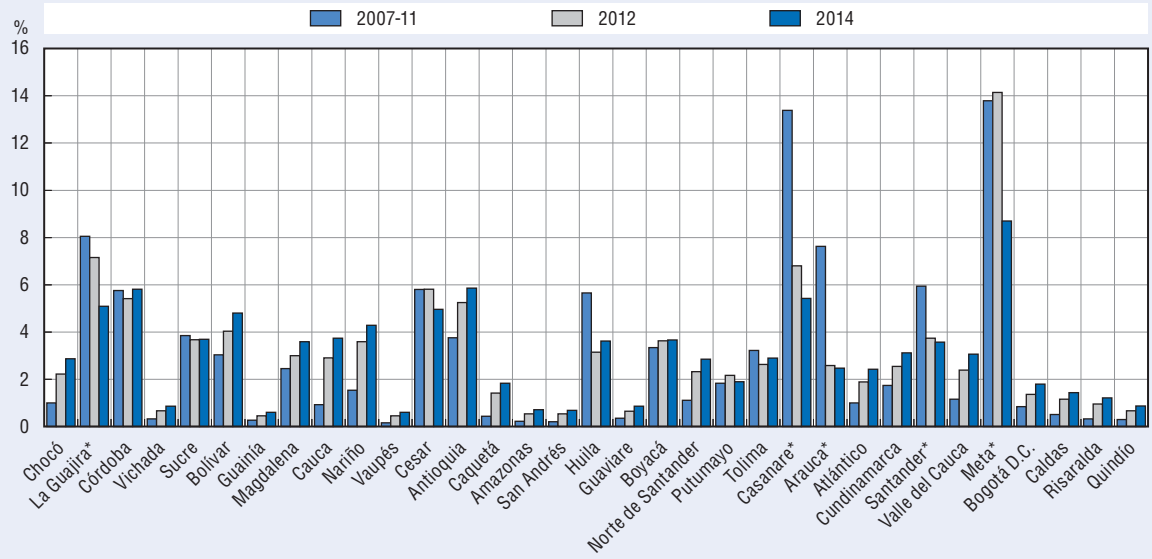
Box 5.4. **Place-based allocations of royalties to develop infrastructure and foster innovation in Colombia**

Colombia is experiencing a boom in the natural-resource industries. Between 2008 and 2011, the sector (chiefly oil, coal, and nickel extraction and processing) accounted for almost 25% of GDP growth, far more than manufacturing's 3.5%. Commodities made up some 65% of total exports in 2011, up from around 50% ten years earlier. The commodity boom provides the country with increasing resources generated from royalties paid by the companies operating in the sector. These royalty revenues accounted for around 1.4% of GDP in 2011.

Recent reforms of the royalty system, effective since 2012, aim at better distributing the resource revenues across regions, or "departments", and promoting productivity growth in the non-commodity economy. Prior to reform (over the period 1994-2010), 17% of Colombia's population benefitted from 80% of the royalty revenues. For different reasons that included widespread corruption, sub-national governments in resource-based regions used to invest those revenues in projects that only insufficiently responded to local needs and did not significantly contribute to growth (Echeverry Garzón et al., 2011). As the figure in this box shows, reforms cut the share of royalty revenues allocated directly to commodity-producing departments to 25% in 2012 and will further reduce it to 10% by 2014.

Box 5.4. **Place-based allocations of royalties to develop infrastructure and foster innovation in Colombia** *(cont.)*

Share of total royalties allocated to individual departments in Colombia before and after the reform



Notes: Departments are classified by an indicator of unmet basic needs (UBN) and population. Chocó has the highest value on this indicator.
The asterisk (*) denotes the departments that received the largest amount of direct royalty payments from commodity production in 2011. They are Meta, Casanare, La Guajira, Santander and Arauca.
Source: OECD (2013b), *OECD Economic Surveys: Colombia Economic Assessment*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_surveys-col-2013-en*.

StatLink http://dx.doi.org/10.1787/888933058730

The royalties not allocated to commodity-producing regions are to be largely spent on infrastructure, innovation and productivity-enhancing projects. For that purpose, three newly created funds – the Regional Compensation Fund, the Regional Development Fund and the Science, Technology and Innovation Fund – will receive at least 50% of all royalties as of 2015. Depending on the increase in expected royalty revenues, up to 30% will go into the Savings and Stabilisation Fund. Royalty funds will be allocated across sub-national governments (departments and municipalities) according to objective criteria such as population size, poverty and UBN (in infrastructure, education and healthcare services, for example). Projects are selected by collegial administrative and policy councils, known by the acronym, OCADs. They bring together senior sub-national officials (mayors and governors) and representatives of national authorities like the Ministries of Finance and Mining and the National Planning Department. The central government has the power to veto OCADs' decisions.

The reform considerably improves the allocation of royalty revenues according to the place-based approach and multi-level governance. However, increased resources for regional authorities need to be matched with greater institutional capacity and more active technical support from central government. Sub-national planning, together with execution and monitoring capacities, should be strengthened to guarantee the appropriate allocation of funds and successfully implemented projects. Central government, for example, could support councils in deciding on which technical assistance projects to perform value for money and social cost-benefit analyses. Furthermore, a share of royalties transferred to regions may be based on regions' improvement over time according to relevant, objective indicators (such as student performance or transport connectivity measures). However, such a mechanism should not discriminate against less developed regions (OECD, 2013c).

Finally, multi-level governance could also help to better co-ordinate the allocation and management of royalty funds and other financial resources, such as regional transfers (which account for nearly 4% of GDP) or locally raised tax revenues.

Shifting infrastructure investment towards higher private-sector participation helps to mitigate the strain on public budgets and can improve transparency and efficiency under certain conditions. Public-private partnerships (PPPs) can also be an efficient way of delivering local infrastructure, though rigorous budgeting systems should be in place to account for the contingent liabilities such projects imply. PPPs are, therefore, more applicable to countries with well-established budgetary systems. Given that PPP contracts are usually highly complex, central institutions should either establish close links with regional agencies or build up local capacity to manage procurement processes while exploiting their local knowledge. In order to streamline processes and improve co-ordination between local and national agents in PPP processes, governments could draft operating manuals or develop standard procurement models, specifically designed for regional infrastructure projects.

A more standardised way of financing infrastructure on a broader scale is through project- or infrastructure-related bonds. Issues such as financial instruments require adequate administrative capacity and domestic financial markets of a certain depth. They can, however, attract both domestic and foreign investors. A specific variant that has recently become popular is the so-called "revenue bond", where investors are users of an infrastructure project and their return is related to the revenue streams generated by the completed project. The success of such projects hinges on close monitoring by the investors and, because the investors are the users, problems related to information asymmetry are less of an issue. Local toll roads and sewerage systems are typical examples of projects funded by revenue bonds as they generate constant cash flows over time and have a clearly circumscribed user group that can finance the investment.

Generally, (regional) governments should make explicit efforts to engage private investors at the local level. In addition to PPPs and bonds, institutional investors are also often interested in stable, long-term revenues, which are typically generated by infrastructure projects. Governments could, for example, try to engage pension or insurance funds as investors, especially if they are locally concentrated, as is often the case in Latin American countries.

Regional policies and tailored public goods should support revealed competitive edges and local needs

Multi-level systems of governance, as discussed above, should be used to develop and implement policies and to provide public goods that have a significant impact on the competitive edges seen in each region. From the design of infrastructure and education systems to labour market regulation, regional factors should direct policy choice and priorities. The development of clusters and the support for innovation in areas of regional competitive advantage are particularly interesting examples of tailored policy approaches.

Basic services should be provided evenly across all regions

Notwithstanding the need for services that meet local needs, access to basic public goods that are not necessarily place dependent should be provided evenly across all regions in fields like education, social services, healthcare, and infrastructure. Such a provision is a valuable way of limiting regional inequalities and providing opportunities for individuals and the development of new competitive edges. In Ireland, for example, education and skills development across the country laid the foundations for the emergence of a large technology sector. Similarly in China, the Western Development

Strategy provides massive support to develop basic services and infrastructure in lagging provinces and shows that some cities in those provinces developed large and productive manufacturing centres (see Boxes 5.3 and 5.5).

Clusters can be effective in exploiting regional competitive edges

Cluster policies can play a particularly useful part in regional competitiveness strategies by leveraging the potential benefits of proximity, agglomeration effects, and externalities between firms (see Box 5.5 on China's clustering strategy in manufacturing through Special Economic Zones). They can also reinforce specialisation linked to local comparative advantages. Such policies are based on the observation that linked industries in a geographical zone often perform better than their more scattered competitors. Within clusters, labour productivity, wages, and employment are often observed to be higher than they are outside them (OECD, 2007). With globalisation, reinforcing clusters may be a way for regions to integrate into global value chains by creating a niche offering, be it based on significant raw material endowments or competitive geographic location.

Box 5.5. **Economic clustering through Special Economic Zones in China and the balancing of inequalities through targeted policies in lagging western provinces**

Successful expansion of Special Economic Zones

The Chinese Special Economic Zones are geographic areas providing certain economic benefits to firms located within the zone. Starting in 1979, their main objective has not only been the attraction of foreign direct investment (FDI), but to serve as experimental poles for the opening process of China (Ge, 1999). SEZ provide foreign investors with an interesting fiscal package, as well as granting property and land rights. Moreover, through the concentration of productive firms and high-skilled labour, they have become important hubs for knowledge and technology transfer.

SEZ are managed by local authorities. China is characterised by highly centralised political and personnel controls at the national level, and a regionally decentralised administrative and economic system (Xu, 2011). In practice, the central government sets key economic objectives and sub-national governments compete among each other to reach them. Thus, sub-national governments are not in only charge of the provision of basic public services such as education and health, but also of the promotion of economic activity in their region, including the administration of SEZ. SEZ are granted by the central government, but their management is responsibility of an administrative committee selected by the local authority (Zeng, 2011). These committees are in charge of authorising certain FDI projects, providing and maintaining local infrastructure, as well as guiding economic activity.

The method for identifying and defining the first SEZ was not random. The central government allowed municipalities to establish SEZ based on their geographic characteristics. During the first years of the implementation of the programme, the position of municipalities with respect to coastal areas and navigable rivers was one of the most important criteria for granting a SEZ; easy access to water transportation was particularly suitable for the production of manufactured exports (Démurger et al. 2002). Following the success of the first wave of SEZ, during 1985-88 additional coastal municipalities were granted this status, and by 1994 all the capital cities of both inland provinces and autonomous regions were opened to foreign investment (Zeng, 2011). The territorial expansion of SEZ, including inland provinces resulted in a multi-level system integrating coastal and inland areas (Wang, 2013).

Box 5.5. **Economic clustering through Special Economic Zones in China and the balancing of inequalities through targeted policies in lagging western provinces** *(cont.)*

The contribution of SEZ to the Chinese economy is not only limited to FDI. Between 2006-07, SEZ approximately accounted not only 47% of utilised FDI, but for 20% of China's GDP, 60% of total exports, and 30 million jobs (Zeng 2011). Moreover, SEZ seem to have induced positive spillovers due to agglomeration economies. According to Wang (2013), based on a counterfactual analysis, the presence of SEZ did not crowd out domestic investment and increased technological progress by 1.6 percentage points. Furthermore, the average wage of workers located in SEZ has increased more than the cost of living, suggesting that the benefits of the program were not arbitraged away by worker mobility.

SEZ have reinforced regional disparities. Coastal provinces have experienced outstanding economic growth during the last three decades. This process has created important socio-economic differences between coastal and inland provinces and overall regional inequality across China (Huang et al., 2003; Kanbur and Zhang, 1999). Starting in the late 1970s, overall regional inequality consistently raised until the last decade. Inequality between inland and coastal provinces has constantly increased, although at faster rate during the 1990s, and a slower rate since 2000. Inequality between inland and coastal provinces is mainly associated to differences in FDI and trade brought by SEZ (Kanbur and Zhang, 2005).

Extensive financial support for economic development in lagging, western regions

Chinese authorities have adopted different policy approaches to reduce inequality across provinces. Probably the most important set of strategies to this end is the one comprised by the Western Development Strategy (WDS). Starting in 2000, this strategy exclusively targets Western Chinese provinces.* Direct policy actions comprised by the WDS include intergovernmental and central fiscal transfers, tax reductions and exemptions, national investment in fixed assets, as well as financial support for credits.

Territorial development strategies have also relied on policies promoting interregional mutual aid. Two examples of these policies are the Hand in Hand Aid (HHA) and the East-West Interaction (EWI) (Lu and Deng, 2011). HHA is a counterpart support policy in which Chinese authorities formulate paring agreements between different regions. These agreements are mainly driven by the central government, and are up to a certain extent compulsory. HHA comprises different economic activities going from construction, to education and technical assistance. The EWI policy also aims at improving the economic interaction between western and eastern regions, although relying on a different strategy. The main objective of EWI is improving the flow of production factors across provinces in order to optimise national production. Contrary to HHA, the EWI policy relies on voluntary actions taken by economic agents in different regions. In this case, the role of the central government is to encourage firms to invest in western regions, and not to allocate economic and financial resources.

Since the implementation of the WDS at the beginning of the last decade, Western provinces have improved their economic performance. The annual growth rate of real GDP per capita in Western China went from 6.6% during the 1990 to 13.2% between 2001-10 (Lu and Deng, 2011). Moreover, mainly drove by the growth of industry, since 2006 Western China's economic growth has surpassed Eastern China and became the fastest growing region. The latter seems to have contributed to reducing overall regional disparities across Chinese provinces (Fan et al., 2011).

* Western provinces include Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang.

There are a number of tools for bringing actors together. One is through formal or informal get-togethers that build networks of common interest and may be initiated by a facilitator visiting firms and building interest in such networks. Regions may also put in place collective services that range from joint purchasing to collective databases and labelling in order to reinforce linkages between participants in clusters. Some programmes also focus on tying research to business: collaborative R&D programmes develop specialised technical education and training, adjusting workers' skills to firms' needs.

Identifying potential sources of competitive advantage and targets to support can be a top-down process, a bottom-up one, or a combination of the two. Using top-down approaches, national governments may identify potential programme recipients non-competitively, e.g. through mapping, or in a competitive way such as, for example, by issuing calls for proposals. Conversely, bottom-up approaches favour consultation at lower levels of governance and are often combined with a horizontal approach that brings local partners into an interactive process.

The design of cluster policies has undergone major changes, from top-down or single-sector approaches to multi-actor and place-based ones. The different tiers of government involved vary considerably across countries, but policies increasingly try to involve local levels of governance as well as local private actors who afford a more realistic view of a region's potential and market opportunities. As the public sector may be less well equipped than the private sector to manage business risks such as changes in competitive product markets, the participation of private funders may also be a factor of success in cluster policies.

The new regional approach can help shape sustainable, well-managed urbanisation

National governments regularly deal with regional disgruntlement on just about every policy issue of significance. There are never-ending debates about managing infrastructure investments equitably across regions. Regional fair-share arguments usually reflect both the urban-rural split and the rich-poor divide. As mentioned above, most policy makers ordinarily live in large cities and, being in close touch with the urban elite and lobbies, they incline naturally to urban primacy, i.e. they favour town over country when it comes to regional development. For that reason, agglomeration is much more than just an economic phenomenon. It is a political and social one, too. Urban primacy, though, is often economically suboptimal because, on balance, agglomeration effects can turn negative as a result of such growing externalities as overpopulation, pollution, and crime.

The best regional policy for developing countries may be one that directly identifies and addresses the negative externalities of agglomeration (Kim, 2011). This involves being aware of both the rising long-term costs of primary city favouritism (excessive agglomeration) and the significant growth potential embodied in intermediate and rural regions. However, it is not immediately clear which, if any, non-primary, non-urban regions – intermediate regions, those close to urban centres, and rural regions remote from cities – should be singled out for place-based strategies in middle-income countries. On purely economic grounds, it can be argued that regions with the highest expected growth returns on policy investments are the ones that are eligible for receiving the bulk of public goods. On purely social grounds, though, it may be contended that population-rich localities with the highest rates of unemployment, under-employment, and poverty should be priority areas for place-based policy intervention.

In all middle-income countries there are population-rich, poverty-ridden localities. Some are located in urban areas, others not. Given the positive correlation between poverty and population growth, localities should prioritise poor, heavily populated areas for policy intervention. Should they ignore them and allow other regions to race ahead in development, convergence to average OECD income levels will become even more difficult. Even worse, widening income inequalities can trigger social unrest and political instability.

As cities in developing regions grow, regional and national governments are faced with multiple challenges to their economic productivity (congestion, housing shortages, and unemployment), to their citizens' well-being (pollution, poor sanitation, social unrest, and environmental degradation), and to safety (natural disasters and crime). While a certain degree of urbanisation and concentration is conducive to economic performance, the problems may eventually outweigh the advantages. This makes it crucial to balance the advantages and trade-offs of urbanisation with regard to the efficiency, sustainability, and equity of economic development.

Proper land use strategies for sustainable urban development

For sustainable urbanisation it is particularly important to develop a proper land use strategy. The uncontrolled conversion of agricultural land into (informal) housing or randomly evolving industrial areas endangers food security, robs local communities of their habitat and subsistence activities, and engenders sprawling cities with inefficient infrastructure networks. Governments should therefore first develop comprehensive land use strategies – in other words, decide where and how to best allocate space for housing, industry, recreation, and infrastructure. Given their close ties to surrounding regions and knowledge of regional characteristics, it is important to fully exploit the knowledge of local government agencies in determining and managing land use strategies. A variety of measures can be used to that end. They include land zoning, titling, readjustment programmes, modern information systems (cadastres), and fiscal instruments such as property taxes to deliberately direct land use and land conversion. In China, for example, conversion of land on city outskirts has proliferated wildly in the last decade despite government controls because many local governments are partially funded through land lease revenues. In this way, fiscal incentives actually counteract city planning, so illustrating the importance of multi-dimensional policy coherence (OECD, 2010).

Regional support for productive development varies across countries

Whereas overall regulatory frameworks are mostly set at national level, incentives to support specific sectors or activities often have a subnational component. Regions' room for manoeuvre in this respect differs significantly across countries. In China, for instance, where sub-national officials are evaluated against a single indicator of economic growth, there are strong incentives to focus on activities that show up immediately in growth figures. Moreover, unfunded spending mandates put pressure on sub-national governments to search for such profitable business opportunities as land development (OECD, 2006).

The level of government responsible for innovation policy varies significantly across countries

In some countries, like India, the bottom-up approach prevails with subnational governments that are competent to manage technological and innovation capabilities. Other countries, like South Africa, follow a more top-down approach with a reduced margin of manoeuvre for subnational authorities.

In China and Brazil, national initiatives coexist with regional actions. In parallel with sector-specific national actions, the two countries implement policies to boost competitiveness and growth in peripheral areas in support of higher, more balanced growth to narrow regional disparities. The policy frameworks used to that end are partly decentralised, so proper co-ordination between levels of governments is important for avoiding overlaps and mismatches.

- In Brazil, the Ministry of Science and Technology supports the proposal and approval of innovation laws in Brazilian states to create the legal basis for state-level action in innovation-related matters. There have been several initiatives to further decentralise the provision of support to innovation, and incentives have been designed to support matching federal, state and private resources for innovation (MCT, 2007; OECD, 2011b). Generally speaking, there was increasingly targeted support to specific regions facing major challenges in production development between 2000 and 2010. Regional development agencies were resurrected after being closed in the 1990s, and the Ministry of Planning, Budgeting and Management refocused on the regional development issue. Since 2011, there has been a move towards more differentiated policies across regions supporting production development and an inter-ministerial body for co-ordination has been proposed (OECD, 2013c).
- China's provinces, while supporting different national five-year plans, have the resources to promote regionally adjusted approaches. National policies also promote balanced regional development in general, with S&T now emerging as a consideration (OECD, 2009b).

Even in countries with no formal decentralisation of competences to the regions, there are cases in which regions still tend to develop regional policies, particularly in science, technology and innovation. Regions in some countries saw their innovation strategy proposals adopted, but a lack of resources prevented their implementation. Irrespective of how decentralised countries' innovation strategies are, appropriate multi-level governance should guarantee that the government or non-government body in charge of designing and implementing them is institutionally capable of delivering and receives the right financial support.

Key considerations to boost competitiveness at the regional level

Regional income disparities may widen as emerging economies develop and all regions need to improve their competitiveness. The competitive advantages that give productive firms an edge and allow them to emerge in any region need to be identified and exploited in order to drive broad-based growth. The following aspects may be considered when developing regional development strategies:

- Regional policies should no longer focus only on redistribution to compensate poorer regions for the higher cost of investment. Countries should identify the comparative advantages – which are dynamic and determined by a mix of market and non-market factors – of individual regions and provide public goods to help exploit untapped resources in line with the multi-level governance model.
- Productive firms can emerge in any region, as analyses of selected developing countries demonstrate. Countries should therefore seek out the competitive edges of their regions. As location appears to have a particular effect on the competitiveness of young firms, every region should nurture environments conducive to entrepreneurship and the creation and survival of new firms.

Key considerations to boost competitiveness at the regional level *(cont.)*

- Identifying competitive regional edges and tailoring public services and goods to local needs requires a certain degree of devolution. Spending powers should better match revenue-raising powers in order to ensure efficient spending at the local level.
- Basic services should, however, be provided across all regions. And to maximise their impact at the national level, countries should prioritise poor, heavily populated regions.
- Governments have important roles to play in supporting the development of clusters and urbanisation so as to further sustainable development and reap the benefits of agglomeration.

References

Ascani, A., R. Crescenzi and S. Iammarino (2012), "Regional Economic Development: A Review", *SEARCH Working Paper*, WP1/03, January.

Audretsch, D. (1998), "Agglomeration and the location of innovative activity", *Oxford Review of Economic Policy,* Vol. 14, No. 2.

Barca, F. (2011). "Alternative approaches to development policy intersections and divergences", in OECD (ed.), *OECD Regional Outlook 2011: Building Resilient Regions for Stronger Economies*, OECD Publishing, Paris, *http://pac-files.oecd.org/acrobatebook/0411081e.pdf*.

Davis, J. and V. Henderson (2003), "Evidence on the Political Economy of the Urbanization Process", *Journal of Urban Economics*, Vol. 53.

Démurger, S., J. Sachs, W. Thye Woo, S.Bao and G. Chang (2002), "The Relative Contributions of Location and Preferential Policies in China's Regional Development: Being in the Right Place and Having the Right Incentives", *China Economic Review* 13 (4), December: 444-465.

Duranton, G. (2008), "From Cities to productivity and growth in developing countries", *Canadian Journal of Economics*, Vol. 41.

Echeverry Garzón, J.C., G.A. Masmela and A.G. Montaña (2011), "Por qué es necesaria la creación de un Sistema General de Regalías", Notas Fiscales, No. 2, Ministerio de Hacienda y Crédito Público, Enero 2011.

Estache, A. (2010), "Infrastructure finance in developing countries: An overview", *EIB Papers*, Vol. 15, No. 2, pp. 60-88.

Fan, S., Kanbur, R., Zhang, X. (2011), "China's regional disparities: Experience and policy", *Review of Development Finance*, Volume 1, Issue 1,

Gil Canaleta, C., P. Pascual Arooz and M. Rapun Garate, (2004), "Regional economic disparities and decentralization", *Urban Studies*, Vol. 41.

Gill, I. (2011), "Improving regional development policies", in OECD (2011), *OECD Regional Outlook 2011: Building resilient regions for stronger economies*, OECD Publishing, Paris, *http://pac-files.oecd.org/acrobatebook/0411081e.pdf*.

Henderson, V. (2010), "Cities and Development", *Journal of Regional Science*, Vol. 50.

Henderson, V. (2009), "Urbanization in China: Policy Issues and Options", unpublished manuscript, China Economic Research and Advisory Programme (CERAP).

Hernandez Trillo F., A. Diaz Cayeros and R. Gamboa Ganzalez, (2002), "Fiscal Decentralization in Mexio: the Bailout Problem", *Research Network Working Paper R-447*, Latin America Research Network, Inter-American Development Bank.

Huang Jr-T., C.-C. Kuo and A.-P. Kao (2003), "The Inequality of Regional Economic Development in China between 1991 and 2001", *Journal of Chinese Economic and Business Studies*, vol. 1(3), pages 273-285, Taylor & Francis Journals.

Joumard, I. (2005), "Getting the most out of public sector decentralisation in Mexico", *OECD Economics Department Working Papers*, No. 453, OECD Publishing, Paris.

Kanbur, R. and Zhang, X. (2005), "Fifty Years of Regional Inequality in China: A Journey through Central Planning, Reform, and Openness", *Review of Development Economics*, 9(1): 87-106.

Kanbur, R. and Zhang, X. (1999), "Which regional inequality? The evolution of rural-urban and inland-coastal inequality in China from 1983 to 1995", *Journal of Comparative Economics*, 27, pp. 686-701.

Kim, J. (2011), "Non-market Effects on Agglomeration and their Policy Responses", in OECD (2011) *OECD Regional Outlook 2011: Building resilient regions for stronger economies*, OECD Publishing, Paris, *http://pac-files.oecd.org/acrobatebook/0411081e.pdf*.

Krugman, P. (1991), "Increasing Returns and Economic Geography", *Journal of Political Economy*, Vol. 99.

Lu, Z. & Deng, X. (2011), "China's Western Development Strategy: Policies, Effects and Prospects", *MPRA Paper 35201*, University Library of Munich, Germany.

MCT (Ministry of Science and Technology, Brazil) (2007), *Science and Technology Action Plan 2007-10*, Brasilia, DF, Brazil.

OECD (2013a), *OECD.Stat* (database), *http://dotstat.oecd.org/*.

OECD (2013b), *OECD Economic Surveys: Colombia 2013: Economic Assessment*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_surveys-col-2013-en*.

OECD (2013c), OECD Territorial Reviews: Brazil 2013, OECD Publishing. *http://dx.doi.org/10.1787/9789264123229-en*.

OECD (2011a), *OECD Regional Outlook 2011: Building resilient regions for stronger economies*, OECD Publishing, Paris, *http://pac-files.oecd.org/acrobatebook/0411081e.pdf*.

OECD (2011b), *Regions and Innovation Policy*, OECD Reviews of Regional Innovation, OECD Publishing, *http://dx.doi.org/10.1787/9789264097803-en*.

OECD (2010), "Financing transport infrastructure development" in *Southeast Asian Economic Outlook 2010*, OECD Publishing, *http://dx.doi.org/10.1787/9789264096004-9-en*.

OECD (2009a), "OECD-GOV Survey on the Multi-level Governance of Science, Technology and Innovation Policy", GOV/TDPC/RD(2009)9, OECD, Paris.

OECD (2009b), *Regions matter: Economic recovery, innovation and sustainable growth*, OECD Publishing, Paris, *http://pac-files.oecd.org/acrobatebook/4211241e.pdf*.

OECD (2007), *Competitive Regional Clusters: National Policy Approaches*, OECD Reviews of Regional Innovation, OECD Publications, Paris, *http://dx.doi.org/10.1787/9789264031838-en*.

OECD (2006), Challenges for China's Public Spending: Toward Greater Effectiveness and Equity, China in the Global Economy, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264013728-en*.

Prud'homme, R. (1995), "The dangers of decentralization", *World Bank Research Observer*, No. 10, pp. 201-20.

Rindebro, U. (2013), "Moody's welcomes reforms aimed at reducing Mexican states' debt burden", *Business New Americas* website, 26 July, *www.bnamericas.com/en/archives/news/26-7-2013*, accessed 5 September 2013.

Storper, M. (1997), *The regional world: territorial development in a global economy*, The Guilford Press, New York.

Wang, J. (2013), "The Economic Impact of Special Economic Zones: Evidence from Chinese Municipalities", *Journal of Development Economics* 101 (March): 133-147. doi: *http://dx.doi.org/10.1016/j.jdeveco.2012.10.009*.

Xu, C. (2011), "The Fundamental Institutions of China's Reforms and Development", *Journal of Economic Literature*, American Economic Association, vol. 49(4), pages 1076-1151, December.

Zeng, D. (2011), "How Do Special Economic Zones and Industrial Clusters Drive China's Rapid Development?", *World Bank Policy Research Working Paper*.

ANNEX 5.A1

Additional tables and figures

Manufacturing technical efficiency (average theta), by region

Table 5.A1.1. **Manufacturing technical efficiency, by region – China**

StatLink http://dx.doi.org/10.1787/888933080200

Table 5.A1.2. **Manufacturing technical efficiency, by region – Colombia**

StatLink http://dx.doi.org/10.1787/888933080219

Table 5.A1.3. **Manufacturing technical efficiency, by region – India**

StatLink http://dx.doi.org/10.1787/888933080238

Table 5.A1.4. **Manufacturing technical efficiency, by region – Indonesia**

StatLink http://dx.doi.org/10.1787/888933080257

Decomposition of labour productivity disparities within and between regions – the size and age dimension

Figure 5.A1.1. **Decomposition of labour productivity disparities within and between regions – the size dimension**

StatLink http://dx.doi.org/10.1787/888933058749

Figure 5.A1.2. **Decomposition of labour productivity disparities within and between regions – the age dimension**

StatLink http://dx.doi.org/10.1787/888933058768

Productivity and employment levels, shares and growth by region

Figure 5.A1.3. **Productivity and employment levels, shares and growth by region – Cameroon**

StatLink http://dx.doi.org/10.1787/888933058787

Figure 5.A1.4. **Productivity and employment levels, shares and growth by region – China**

StatLink http://dx.doi.org/10.1787/888933058806

Figure 5.A1.5. **Productivity and employment levels, shares and growth by region – Colombia**

StatLink http://dx.doi.org/10.1787/888933058825

Figure 5.A1.6. **Productivity and employment levels, shares and growth by region – India**

StatLink http://dx.doi.org/10.1787/888933058844

Figure 5.A1.7. **Productivity and employment levels, shares and growth by region – Indonesia**

StatLink http://dx.doi.org/10.1787/888933058863

Figure 5.A1.8. **Productivity and employment levels, shares and growth by region – Senegal**

StatLink http://dx.doi.org/10.1787/888933058882

Major contributing sectors to regional output growth

Table 5.A1.5. **Sectors that contribute most to regional output growth – Cameroon**

StatLink http://dx.doi.org/10.1787/888933080276

Table 5.A1.6. **Sectors that contribute most to regional output growth – China**

StatLink http://dx.doi.org/10.1787/888933080295

Table 5.A1.7. **Sectors that contribute most to regional output growth – Colombia**

StatLink http://dx.doi.org/10.1787/888933080314

Table 5.A1.8. **Sectors that contribute most to regional output growth – India**

StatLink http://dx.doi.org/10.1787/888933080333

Table 5.A1.9. **Sectors that contribute most to regional output growth – Indonesia**

StatLink http://dx.doi.org/10.1787/888933080352

Table 5.A1.10. **Sectors that contribute most to regional output growth – Senegal**

StatLink http://dx.doi.org/10.1787/888933080371

Concentrations of most productive firms

Table 5.A1.11. **Concentrations of most productive firms – Cameroon**

StatLink http://dx.doi.org/10.1787/888933080390

Table 5.A1.12. **Concentrations of most productive firms – China**

StatLink http://dx.doi.org/10.1787/888933080409

Table 5.A1.13. **Concentrations of most productive firms – Colombia**

StatLink http://dx.doi.org/10.1787/888933080428

Table 5.A1.14. **Concentrations of most productive firms – India**

StatLink http://dx.doi.org/10.1787/888933080447

Table 5.A1.15. **Concentrations of most productive firms – Indonesia**

StatLink http://dx.doi.org/10.1787/888933080466

Table 5.A1.16. **Concentrations of most productive firms – Senegal**

StatLink http://dx.doi.org/10.1787/888933080485

Perspectives on Global Development 2014
Boosting Productivity to Meet the Middle-Income Challenge

Chapter 6

Development challenges of the BRIICS

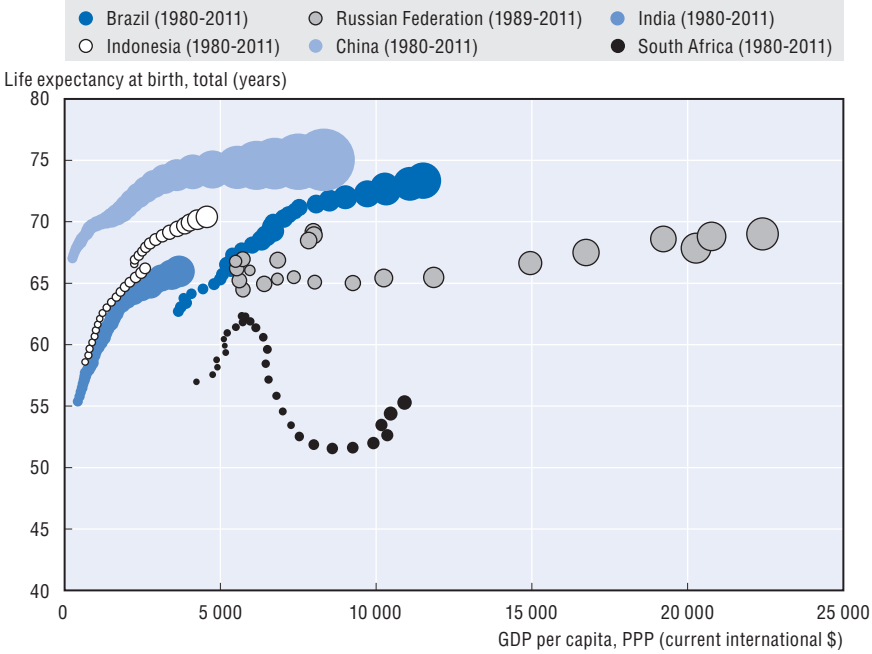
The performance of the BRIICS (Brazil, the Russian Federation, India, Indonesia, China and South Africa) will be essential for continuing the process of shifting the weight of economic activity from OECD to non-OECD countries. Moreover, the diversity of BRIICS' development experiences and the challenges and opportunities they face may be of interest to other developing countries as they craft their own development strategies. This chapter firstly explores the sources of their economic growth and the development of their international integration; highlighting the importance of investment and imports of foreign knowledge for sustained and increasingly productivity-driven growth. Building on this, the chapter also includes individual country notes for each of the BRIICS providing more details on the history of their economic development and the challenges and prospects for them to move beyond the middle-income level; underlining that it requires not only economic policies, but also adjustments to improve equity and environmental sustainability.

The performance of the BRIICS (Brazil, the Russian Federation, India, Indonesia, China and South Africa) will be essential for continuing the process of shifting the weight of economic activity from OECD to non-OECD countries. Together they accounted for more than 20% of world GDP in 2012; only a decade earlier their joint share was below 10%. Almost half of world's population lives in BRIICS countries.

Despite their impressive economic performances, the BRIICS have experienced very diverse development paths, resulting in different income levels and speeds of income convergence with more advanced countries (Figure 6.1). With the exception of the Russian Federation, which has recently reached high-income status (partly due to resource-rents during the ongoing commodity boom), the BRIICS belong to the middle-income group of economies, with Brazil, China and South Africa in the upper tier and India and Indonesia in the lower tier. China, and to a lesser extent India, Indonesia and the Russian Federation have exhibited robust economic growth during the last decade, while Brazil and South Africa need to embark on a more rapid and sustainable growth path.

Figure 6.1. **Life expectancy in the Russian Federation and in South Africa has decreased considerably**

Evolution of GDP per capita (x-axis), life expectancy at birth (y-axis) and the size of the economy in GDP (bubble)



Note: The GDP per capita (in PPP terms) series are based on the old benchmark year, 2005. Using the new PPP data released in May 2014 would scale up the GDP per capita figures for the BRIICS slightly.

Source: Authors' calculations based on World Bank (2013a), *World Development Indicators* (database), *databank.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933058901

The BRIICS have also experienced very diverse paths from a more human and social development perspective during the last three decades or so. All BRIICS have experienced significant improvements in terms of life expectancy at birth during this period; except in the Russian Federation and South Africa (Figure 6.1). In the Russian Federation, life expectancy at birth fell from 69 to 65 during the transition from a centrally-planned to a market economy in the 1990s and only recently recovered to the levels at the end of the USSR. Similarly in South Africa, life expectancy fell from 62 to 52 between 1990 and 2005 as a result of AIDS. Income inequality has risen in all the BRIICS except Brazil and the Russian Federation (see Annex Table 6.A2.2). The rise in inequality has been fastest in China and the Russian Federation; although it has fallen more recently in the Russian Federation. Income inequality is highest in South Africa. Brazil has lowered its inequality from levels similar to South Africa through explicit government policies, but also by an expansion of labour force participation rates and greater employment. Furthermore, most of the BRIICS face social tensions. Brazil has seen major demonstrations from a rising middle class that wants better services from government. The Russian Federation has had demonstrations from a middle class that has benefited from growth but wants greater political voice. India faces the risk of instability from a rapidly growing labour force which its current development strategy is not able to absorb. South Africa also faces instability from very high unemployment and inequality. China faces possible instability from a breakdown of the implicit "social contract" of little voice in government in exchange for economic growth if the economy slows below a threshold level.

BRIICS countries also have challenges of environmental degradation, particularly China and the Russian Federation where rapid industrialisation has had a heavy toll on the environment. Brazil and Indonesia face the challenge of deforestation. India faces the challenge of food security unless agricultural productivity can be increased again. China and India also face serious problems of inefficient use of water and water shortages (see Annex Table 6.A2.3). On the energy side, all but Brazil have high energy use per unit of GDP compared to the OECD average, with the highest in the Russian Federation and South Africa, followed by China (see Annex Table 6.A2.3). China is also facing the downside of rapid industrialisation from air pollution in its major cities which may become a serious health problem and is likely to reduce life expectancy for urban residents.

Given the diversity of BRIICS' experiences some of the challenges and possible ways forward may also be of interest to other developing countries as they craft their own development strategies. Therefore, this chapter firstly explores the commonalities and differences of sources of economic growth in the BRIICS – both from the expenditure and the factor accumulation perspective – and the development of their international integration over the last two decades. It identifies structural vulnerabilities and challenges they may have. Building on the first two sections, the chapter also includes individual country notes for each of the BRIICS providing more details on the history of their economic development, the challenges and prospects for these countries to move beyond the middle-income level in the next few decades and key areas of policy adjustments to address these challenges. These country notes underline that moving towards convergence with developed countries is not limited to economic policies, but also require policy adjustments to improve equity and environmental sustainability in these economies.

Differing drivers of growth across the BRIICS

Among the BRIICS, China and India experienced the most impressive growth during the last two decades or so. With the commodity price boom since the 2000s, the other BRIICS (Brazil, the Russian Federation, Indonesia and South Africa) also accelerated

growth. The drivers of growth from both the expenditure perspective and the factor accumulation perspective vary considerably across the BRIICS and provide some insights about differences in their overall growth performance.

India, Indonesia and China experienced impressive capital accumulation-led growth

The Asian BRIICS (India, Indonesia and China) can be differentiated from the rest of the group in that they accumulated capital at a considerably faster pace than Brazil, the Russian Federation and South Africa. China and India have continuously increased the share of investment in GDP over the last two decades or more. China increased this share from around 35% in 1991 to above 50% in 2013 (Figure 6.2, Panel E). China is the only country among the BRIICS where gross capital formation was the largest expenditure component of GDP in 2013. In India, the investment share increased from below 30% to almost 40% between 1997 and 2013 (Figure 6.2, Panel C). Indonesia invested heavily at the beginning of the 1990s with a GDP share of investment above 30%. With the Asian crisis at the end of the 1990s the investment share in GDP was reduced to 20% and slowly increased again to almost 30% in 2013 (Figure 6.2, Panel D). The other BRIICS (Brazil, the Russian Federation and South Africa) reported lower investment shares at around 20% during the last two decades or so; with exceptions for some years particularly in the Russian Federation. Lower investment shares in those countries are not surprising given their higher capital stocks in per capita terms (including infrastructure, real estate and business capital) compared to the Asian BRIICS. (Capital stock estimates are based on Berlemann and Wesselhoft, 2013.)

The contribution of investment to overall economic growth was particularly important in China and India during the last decades. Investment's contribution to growth was above 50% since the beginning of the 2000s, at 25% in the second half of the 1990s and slightly below 50% at the beginning of the 1990s in China (Figure 6.3, Panel E). In India, the contribution of investment at almost 50% in the 2000s was also clearly higher than in the other BRIICS (Figure 6.3, Panel C). Investment was responsible for around 25% or more of GDP growth in Indonesia, the Russian Federation and South Africa. In Brazil, gross capital formation contributed 35% to growth at the end of the 2000s, with clearly smaller contributions in other periods.

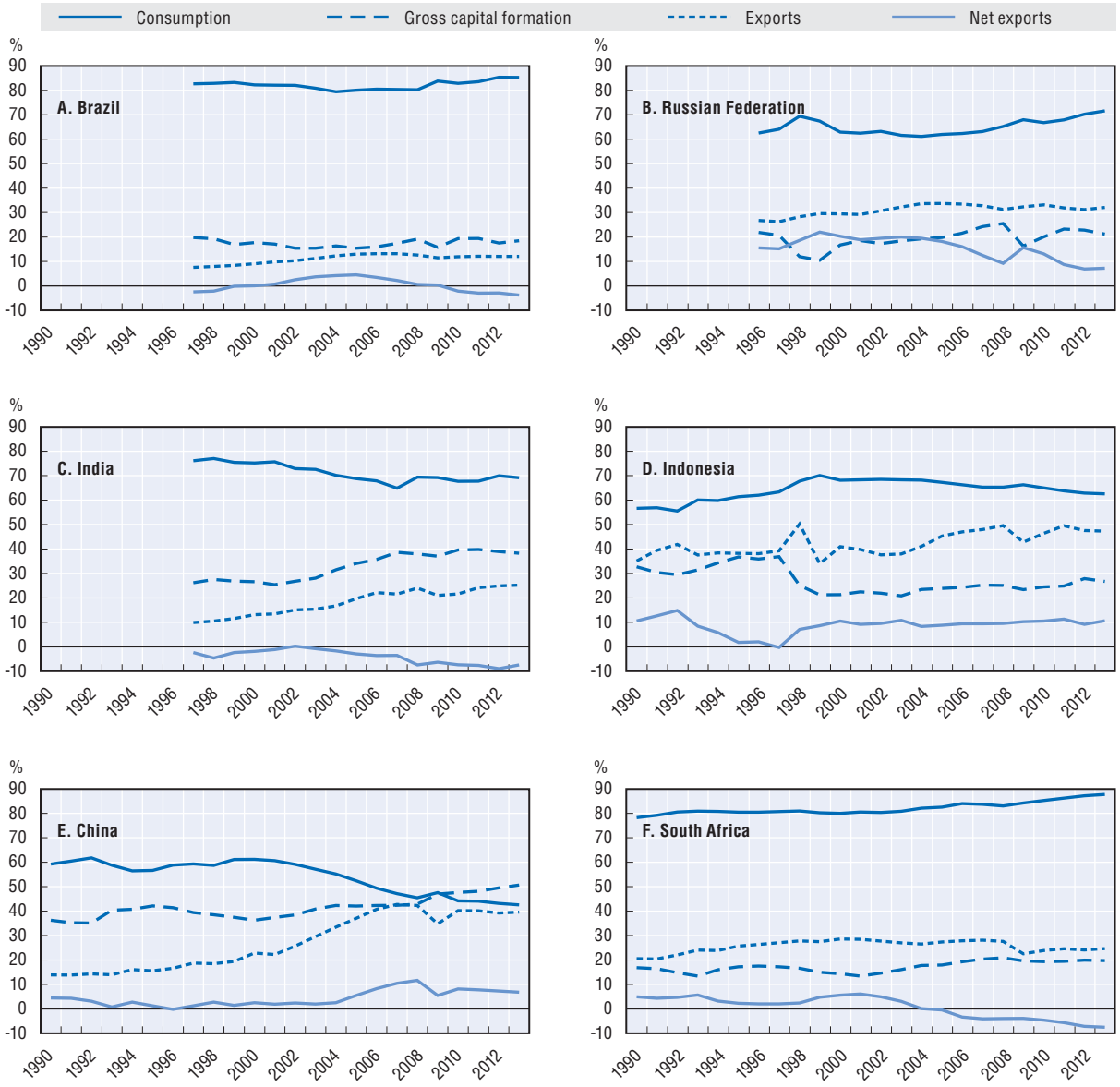
All BRIICS still fall clearly behind the OECD average in capital stock levels and thus capital accumulation-led growth is still possible (Berlemann and Wesselhoft, 2013). A growth accounting decomposition, from the factor accumulation perspective, reveals that the accumulation of capital translated significantly into economic growth over the last two decades in all the BRIICS (Figure 6.4, the contribution of capital stock growth is decomposed into ITC capital and non-ICT capital growth). Its contribution was more than 50% in all BRIICS during the last decade, except in the Russian Federation where this holds only for the second half of the 2000s. The contribution of both ICT and non-ICT capital to growth has been considerable in Brazil and South Africa. In India, Indonesia and China catching up growth through non-ICT capital accumulation was higher than through ICT capital. The Russian Federation has been growing through ICT capital accumulation and not non-ICT capital. Thus, the increase in the capital stock continues to be an important factor to increase production output, where the accumulation of ICT capital seems to become more relevant in richer economies.

South Africa, but also India have room for growth through better utilisation of labour

The contribution of employment growth to output/GDP growth was in general lower compared to the contribution of capital accumulation in all BRIICS during the last two

Figure 6.2. **Investment share in GDP increased in China, India and Indonesia**

GDP shares in %, by expenditure type



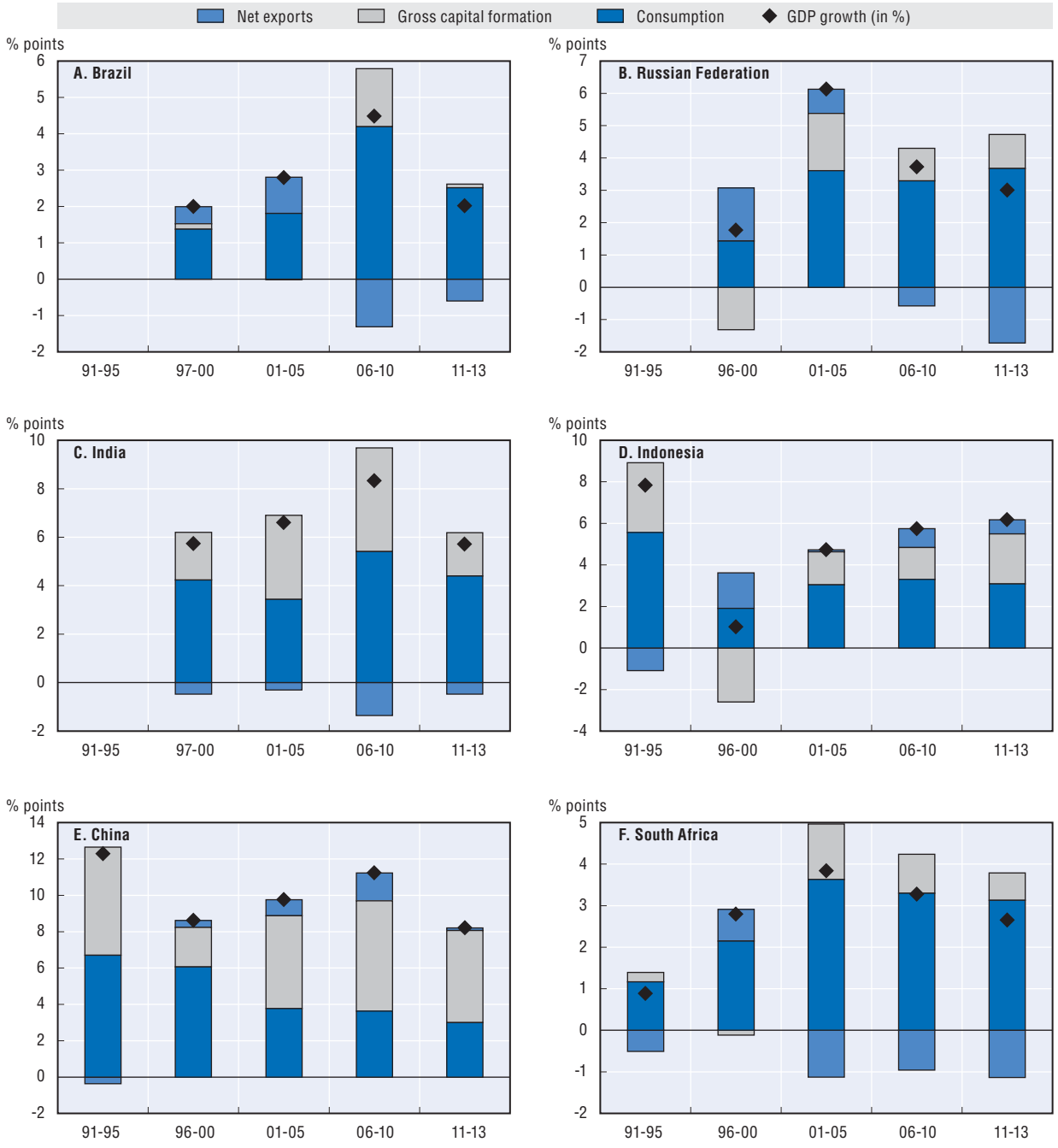
Notes: The GDP shares of different expenditure components are calculated in real terms, i.e. each expenditure component is deflated with a year-on-year component-specific deflator (not a base year deflator). Consumption includes private and government consumption.
Source: OECD (2014), *OECD Economic Outlook* (database), *http://dotstat.oecd.org/*.

StatLink http://dx.doi.org/10.1787/888933058920

decades (Figure 6.4). Nevertheless, in Brazil, India and South Africa employment growth was an important driver of growth. On average, it contributed 30% to overall growth in Brazil, 20% in India and 50% in South Africa; with clearly below average contributions in more recent years, particularly in India and South Africa. Employment growth also contributed positively to overall growth in China and Indonesia during the last two decades; but relative to other factors of output growth, this contribution was smaller. The change in the skills composition of labour has not strongly contributed to growth during the last two decades (Figure 6.4); an exception may be South Africa where the change in the labour composition contributed more than 10%.

Figure 6.3. **Growth in China, India and Indonesia is associated with strong investment growth**

GDP growth contributions (in percentage points), by expenditure type



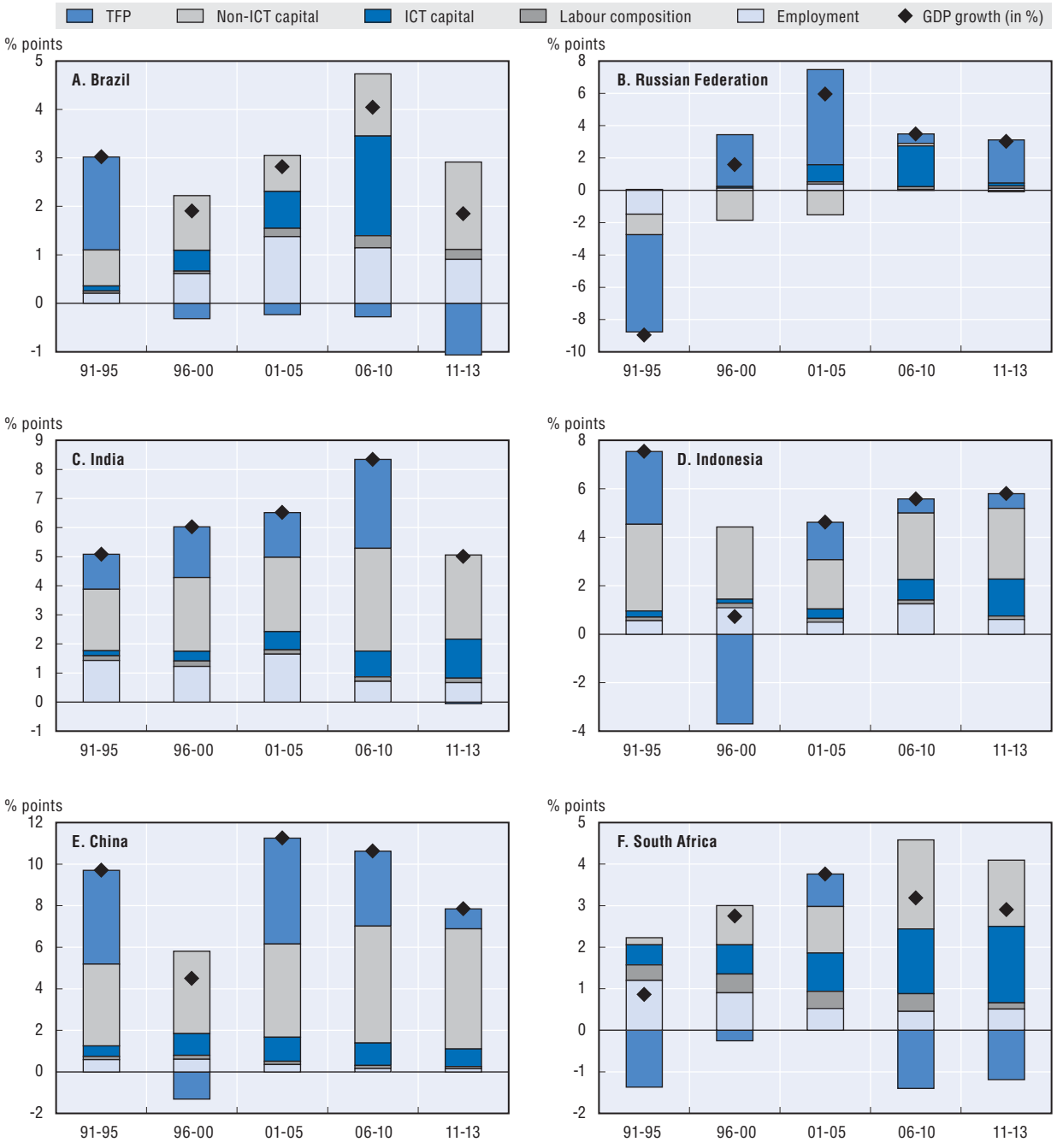
Notes: The contributions of different expenditure components to GDP growth are calculated in real terms, i.e. each expenditure component is deflated with a component-specific deflator using 2010 as the base year.

Source: Authors' calculations based on World Bank (2013a), *World Development Indicators* (database), *databank.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933058939

Figure 6.4. **Capital accumulation has been the most important driver of growth in all BRIICS**

GDP growth contributions (in percentage points), by production factors



Notes: TFP stands for total factor productivity growth. Non-ICT, ICT and employment stand for the contribution of non-ITC capital growth, ICT capital growth and employment growth, respectively. Labour composition stands for the contribution to growth of changes in the skills composition of labour. For methodological details of this growth decomposition see *https://www.conference-board.org/retrievefile.cfm?filename=Methodological-Notes–20141.pdf&type=subsite*

Source: The Conference Board (2014), *The Conference Board Total Economy Database* (database), *https://www.conference-board.org/data/economydatabase/*.

StatLink http://dx.doi.org/10.1787/888933058958

Particularly in South Africa and India, labour is still underutilised with labour utilisation rates 40% and 20% lower than in the OECD on average in 2011, respectively (see Chapter 2, Figure 2.1).[1] Thus, continued employment growth in these countries would most likely lead to significant economic growth and would at the same time allow sharing economic growth among the population more broadly. Employment growth in these two countries is particularly relevant given their still very young populations entering the labour market in the coming years (Table 6.1). Among the BRIICS, India and South Africa have the youngest populations and are projected to have the lowest dependency ratios in 2040.

Table 6.1. **Population ageing raises dependency ratios**

Evolution of median age, total, old-age and child dependency ratios, 1950-2050

	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050
Brazil											
Median age	19	19	19	20	23	25	29	33	37	41	44
Total dependency ratio	80	87	85	73	66	54	48	44	47	52	61
Old-age dependency ratio	5	6	7	7	7	8	10	14	20	27	36
Child dependency ratio	75	81	79	66	59	46	38	30	27	25	25
China											
Median age	24	21	19	22	25	30	35	38	42	46	46
Total dependency ratio	63	77	79	68	54	48	36	43	47	58	63
Old-age dependency ratio	7	7	7	9	9	10	11	17	24	35	39
Child dependency ratio	56	70	72	59	45	38	25	26	23	23	24
India											
Median age	21	20	19	20	21	23	25	28	31	34	37
Total dependency ratio	68	77	80	75	71	63	54	49	47	46	48
Old-age dependency ratio	5	5	6	6	7	7	8	9	12	15	19
Child dependency ratio	63	71	74	69	64	56	47	40	35	31	29
Indonesia											
Median age	20	20	19	19	21	24	27	30	32	35	38
Total dependency ratio	76	77	87	81	67	55	53	47	46	50	53
Old-age dependency ratio	7	6	6	17	6	7	8	9	13	19	24
Child dependency ratio	69	70	81	74	61	47	46	38	33	31	29
Russian Federation											
Median age	24	27	31	31	33	36	38	39	42	43	42
Total dependency ratio	53	58	51	47	50	44	39	48	52	52	60
Old-age dependency ratio	7	10	12	15	15	18	18	22	28	28	33
Child dependency ratio	46	48	40	32	34	26	21	26	25	24	27
South Africa											
Median age	21	20	19	19	20	23	25	28	29	31	34
Total dependency ratio	73	81	84	81	73	57	54	54	49	46	47
Old-age dependency ratio	6	7	6	6	6	5	8	10	11	12	15
Child dependency ratio	67	74	77	75	67	52	46	44	38	34	32

Notes: Median ages estimated for 2010 and projected for 2025 and 2050. Dependency ratios are calculated as the number of dependents per 100 working-age people.

Source: UN-DESA (2013), *World Population Prospects* (database), *http://esa.un.org/unpd/wpp/unpp/panel_population.htm*.

Productivity growth was strongest in the Russian Federation, India and China

Productivity growth is important in all stages of development. However, when factor accumulation-led growth is fading, countries need to make greater efforts to boost productivity to allow their economies to continue growing. Total factor productivity (TFP) growth has contributed significantly to overall economic growth in India and China during

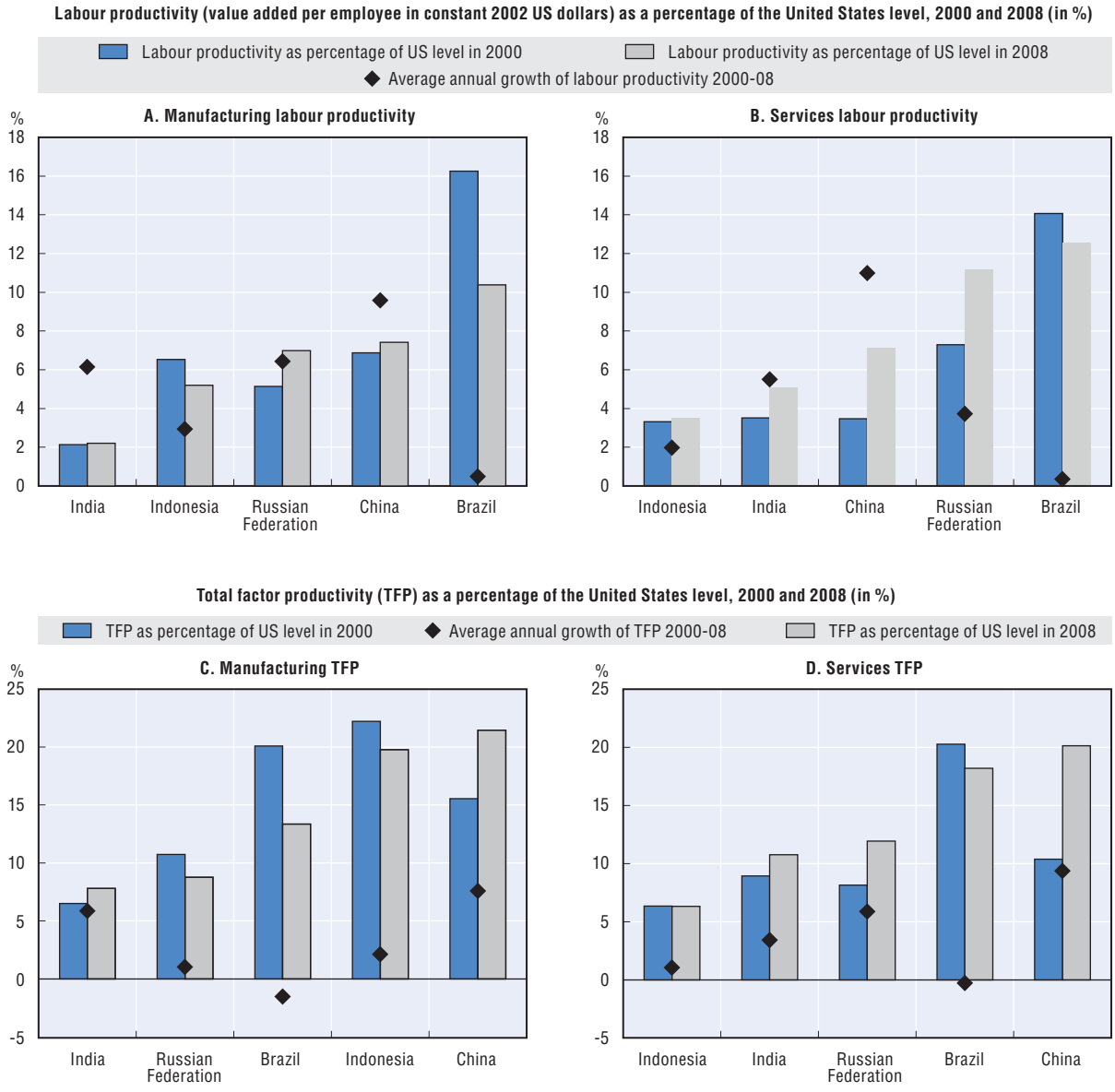
the last two decades (Figure 6.4, Panels C and E) and in the Russian Federation since the mid-1990s (Figure 6.4, Panel B).[2] TFP growth has been fading towards the end of the 2000s in the Russian Federation, before it increased again since 2010. In China, TFP also decreased towards the end of the 2000s and contributed only around 10% to GDP growth since 2010. India has seen increasing TFP until the end of the 2000s, but TFP growth stalled in the last three years. In all other BRIICS, the growth contribution of productivity was either negative or – if positive – relatively small.

A more detailed focus on productivity growth – that is, based on detailed sectoral estimates of labour productivity and TFP growth –also reveals strong productivity growth in China, India and to some extent in the Russian Federation. Among the BRIICS, China recorded the most impressive growth in productivity over the last decade: around 10% annually in terms of labour productivity and above 7% in terms of TFP in both manufacturing and services (Figure 6.5). India has also experienced considerable productivity growth during the same period, though the speed of productivity improvement lagged behind China's. The Russian Federation reported robust labour productivity growth in manufacturing and services. However, the estimates indicate no TFP improvement in manufacturing during the last decade in the Russian Federation. The economy-wide TFP growth in the Russian Federation during the same period (Figure 6.4) is thus most likely associated with improvements in services and high economic rents in the resource sectors. Indonesia is a less productivity-driven economy. Brazil has come to a standstill in labour productivity growth and TFP growth even decreased in both manufacturing and services. Estimates for selected manufacturing sectors in South Africa also indicate low productivity growth compared to other BRIICS (not reported in the figure). Moreover, TFP growth appears to be driven by within-firm productivity growth rather than the reallocation of market shares between firms in most BRIICS (see Figure 3.3 in Chapter 3). An exception is Indonesia, where more productive firms command an increasing share of output.

Productivity levels are lagging behind advanced countries' in all BRIICS

Productivity levels also have an important bearing on the ability of the BRIICS to find new drivers of economic growth. While productivity growth directly translates into economic growth, productivity levels indicate to what extent a country has managed to compete in higher value-added agriculture, industry and service sectors or segments of these sectors. Labour productivity and TFP levels in the BRIICS in manufacturing and services are still considerably lagging behind those in more advanced economies (Figure 6.5). All BRIICS have labour productivity levels around or below one tenth of that of the United States in manufacturing; in services, only Brazil and the Russian Federation exceeded that level but only by one or two percentage points (Figure 6.5, Panels A and B). BRIICS' labour productivity gaps in the manufacturing sector are mainly related to gaps in industry-level productivity rather than to the industry structure (see Figure 3.1 in Chapter 3). BRIICS' TFP gap with the United States is also large and ranges between 6 and 22% (Figure 6.5, Panels C and D). Countries with lower capital-output ratios (such as China in manufacturing and services and Indonesia in manufacturing) tend to have higher TFP levels compared to other BRIICS, even if their labour productivity ranking is lower. Comparable aggregate manufacturing data for South Africa was not available, but comparisons for selected manufacturing sectors suggest productivity levels for South Africa at the lower end among the BRIICS.

Figure 6.5. **Productivity gaps in the BRIICS are large**



Notes: Labour productivity is defined by value added per employee (in 2002 US dollars). Total factor productivity (TFP) is defined as the residual explaining value added after accounting for labour and capital. All variables are in real terms and converted to US dollars at annual average exchange rates. The base year is 2002. TFP is estimated with sector level data for 14 manufacturing and 18 services sectors classified according to the International Standard Industrial Classification Revision 3 (ISIC Rev. 3). Aggregate TFPs for manufacturing and service sectors are weighted by value added. Methodological details can be found in the annex (Annex 6.A1). Comparable data for South Africa was not available, but comparisons for selected manufacturing sectors suggest productivity levels for South Africa at the lower end among the BRIICS.

Source: Authors' estimations using Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper*, Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

StatLink http://dx.doi.org/10.1787/888933058977

Given the considerable remaining productivity gap of the BRIICS, further productivity gains may still be realised by emulating more productive processes elsewhere. This allows the maintenance of lower costs that can support export-led catching up. Once foreign technology adoption possibilities are exhausted, the old engines start to splutter and new sources of productivity gains are needed.

The challenges of international integration in the BRIICS

All BRIICS have impressively increased international integration through exports, imports and FDI during the last two decades; particularly with the rise of China and the accompanied commodity price boom in the 2000s (see Figures 1.3 and 1.4 in Chapter 1). Significant trade and investment reforms also contributed to accelerated international integration in these countries. India, for example, unilaterally reduced tariffs during this period. China and, to a lesser degree, the Russian Federation had to make reforms in order to join the World Trade Oranisation (WTO).

The balance of exports and imports of goods and services was positive – although decreasing – in most of the BRIICS during the 2000s; with the exception of India reporting a negative balance and South Africa reporting a negative balance since the mid-2000s (Figure 6.2).[3] Brazil also reports a trade deficit since 2010. The net exports component of GDP was however the smallest of all expenditure components in the BRIICS. Moreover, in some 5-year spells during the last two decades, exports increased slower than imports in some of the BRIICS, resulting in a negative contribution of net export growth to GDP from an expenditure perspective (Figure 6.3). Net exports contribution to GDP growth was, however, clearly positive in China and Indonesia since the mid-1990s. Other BRIICS had also experienced various periods of a positive net export contribution to growth during the last two decades.

While the direct contribution of net exports to GDP and net export growth to GDP growth is shown to be relatively small in the BRIICS, international integration through exports and imports has many indirect effects on GDP and its growth (Lin and Li, 2002; Zhu and Kotz, 2010). For example, tapping foreign knowledge through imports of capital goods and services reduces net exports, but allows moving up the value chain and boosts domestic production and exports.

Among the BRIICS, Brazil has the lowest export share in GDP

Export shares in GDP vary considerably among the BRIICS. While China's and India's export shares in GDP were at around 5% at the beginning of the 1980s, their shares increased continuously ever since to around 30% in China and above 20% in India in 2010 (Figure 6.2, Panels E and C). Similarly, in the Russian Federation, the share of exports in GDP increased from just above 10% in the 1990s to around 30% in the 2000s. In Indonesia and South Africa, exports have traditionally played a significant role. During the last three decades, export shares in GDP stood at around 30% in the South Africa and at around 20% in Indonesia (Figure 6.2, Panels F and D).

Brazil is the least internationally integrated country of the BRIICS; at least in terms of exports. Export shares increased from 5% in 1981 to a still low share compared to other BRIICS countries at around 10% in 2010 (Figure 6.2, Panel A).

Resource-rich BRIICS diversified into non-resource-based manufacturing exports before the commodity price boom

Although the four resource-rich BRIICS (Brazil, the Russian Federation, Indonesia and South Africa) traditionally exported mainly natural resource-based products, these countries diversified into non-resource manufacturing twenty or more years before the commodity price boom in the 2000s (Figure 6.6, Panels A, B, D, F). Brazil mainly exported food in 1965 (70% of merchandise exports) and then diversified into non-resource manufacturing, which gained a share of 60% in 2000. Indonesia's export structure was dominated by fuels in 1975 (70% of total merchandise exports), but non-resource manufacturing also gained significant share until 2000 (reaching almost 60% in 2000, up from nearly 0% in 1975). South Africa was traditionally strong in food as well as ores and metals exports (accounting together for more than 50% of total merchandise exports in 1975). Compared to Brazil and Indonesia, the country industrialised earlier and non-resource manufacturing was 35% of total merchandise exports in 1975. South Africa also diversified more into manufacturing (also reaching a share of around 60% by 2000). In the Russian Federation, non-resource manufacturing is less important given its significant comparative advantage in the production and exportation of fuels. The share of non-resource manufactures reached only 30% by 2000, while the share of fuels was still at 60%.

Given that India and China are less abundant in natural resources, exports as a share of GDP were small before these economies started to industrialise (Figure 6.2). With the start of their manufactured exports (towards the end of the 1980s), their comparative advantage in non-resource-based manufacturing became apparent. By 2000, India reached a share of 80% of non-resource-based manufacturing exports in total merchandise exports; this share stood at 90% in China (Figure 6.6, Panels C and E).

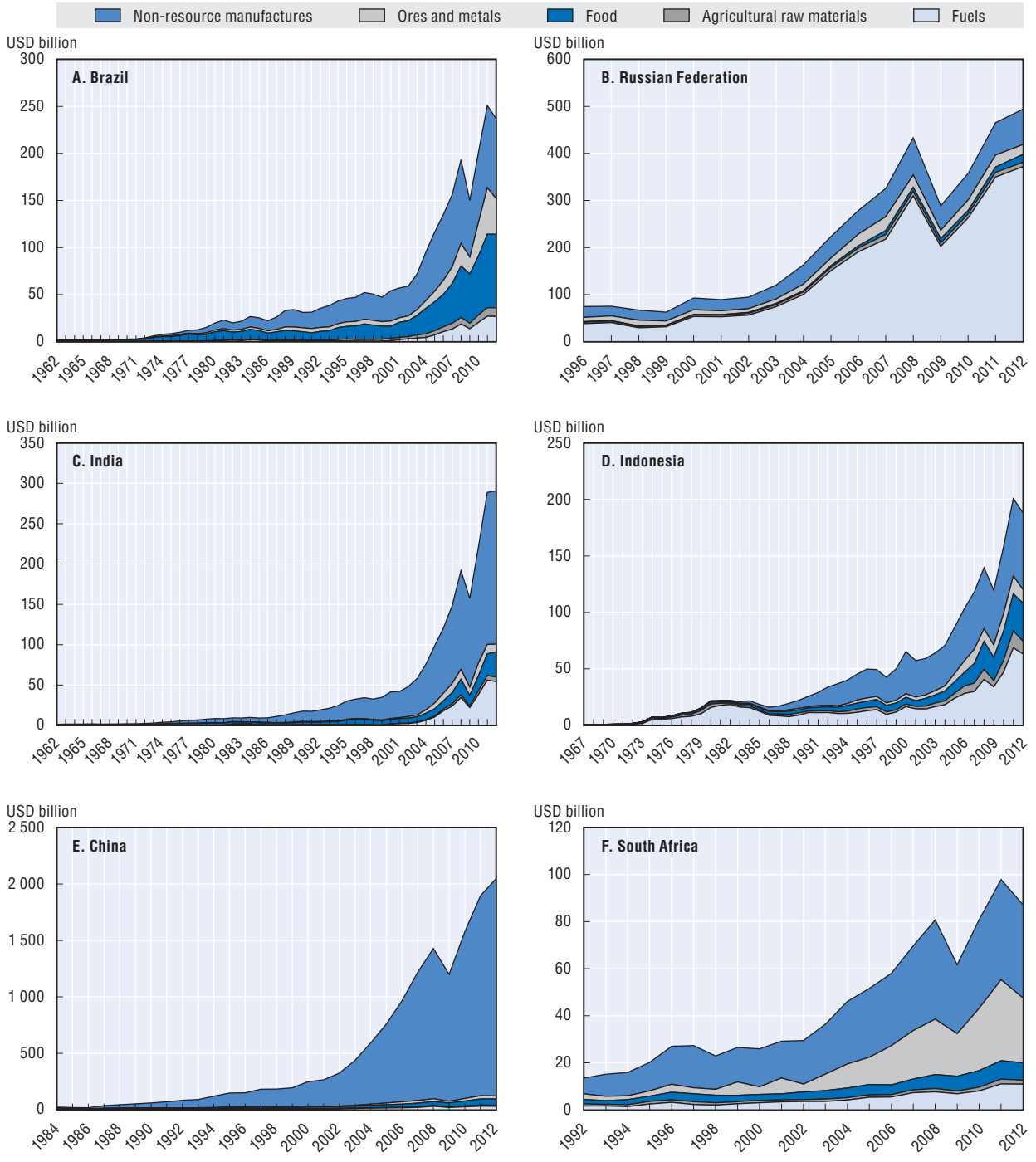
Resource-rich BRIICS have reduced the level of export diversification during the commodity price boom

The commodity price boom since the start of the "shifting wealth" process has led to major changes in the export structure of the BRIICS. Along with a fast expansion of the economy as a whole, China's exports increased eight-fold since 2000, pre-dominantly in the non-resource manufacturing sector. In addition, China has been increasing the technological intensity of its exports. Of total Chinese exports in 2012, almost half fall under capital goods and around 35% can be classified as high technology products (e.g. electrical and computing machinery or communication equipment), up from around 10% in 1995 (see Annex Figures 6.A2.1 and 6.A2.2). The level of diversification in terms of the number of export products in which China has a revealed comparative advantage (RCA) increased at a fast pace since 1995 (Figure 6.7) and China had the most diversified export structure among the BRIICS with an RCA in over 280 products in 2010.[4]

Resource-rich developing economies – including Brazil, the Russian Federation, Indonesia and South Africa, among the BRIICS – benefited from the rise of China by supplying China's increasing demand for raw materials and resource-based products. Brazilian exports increased five-fold between 2000 and 2012, particularly through boosts in food exports, but also in ore, metals and fuels (Figure 6.5, Panel A). The commodity boom also came to the benefit of the resource-rich Russian Federation, which like Brazil increased total exports by a factor of five since 2000 (Figure 6.6, Panel B). Fuel products

Figure 6.6. **All BRIICS expanded exports at a fast pace since 2000**

Exports of merchandise goods in nominal USD billion, by product type



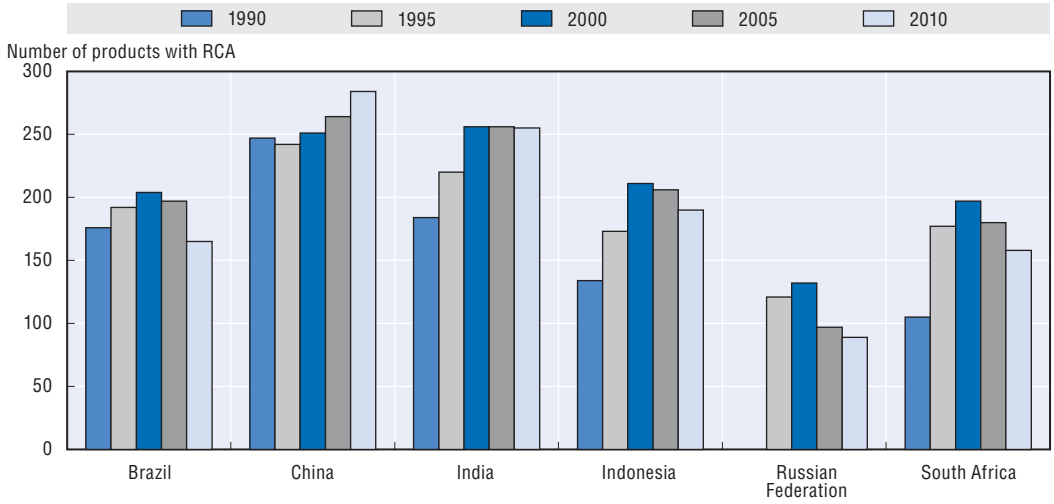
Notes: Manufactures are referring to non-resource-based manufactures and thus exclude food products or the simple processing of raw materials.

Source: Authors' calculations based on World Bank (2013a), *World Development Indicators* (database), *databank.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933058996

Figure 6.7. **China is diversifying its exports at a fast pace**

Number of products with revealed comparative advantage (RCA)



Notes: Products in this figure correspond to 4-digit SITC products. A country has a revealed comparative advantage (RCA) in the production of a product if the export share of that product in total exports of the country is higher than the export share of that product in world's total exports.

Source: Authors' calculations based on UN Comtrade (2013), *United Nations Commodity Trade Statistics* (database), *http://comtrade.un.org/db/default.aspx*.

StatLink http://dx.doi.org/10.1787/888933059015

accounted for 75% of total merchandise exports in 2012, up from less than 60% in 2000. These fuel exports include to a large extent consumer ready products. In Indonesia and South Africa, export performances over the last decade were – with a four-fold increase – the least impressive among the BRIICS. As a resource-rich economy, Indonesia's exports of food, ore and metals and fuels increased at the fastest pace and gained shares in total exports (Figure 6.6, Panel D). In South Africa, ore and metal exports have picked up fastest (Figure 6.6, Panel F). To some extent also India (although not known as a resource-rich country except for coal) benefited from the commodity boom with manufactures of coke among its most important merchandise exports (Figure 6.6, Panel C).

The resource-rich BRIICS also expanded their non-resource-based manufactures exports significantly during the last decade (Figure 6.6). Given the export opportunities driven by the commodity boom, their exports of non-resource-based manufactures increased at a slower pace than those of resource-based products. In contrast to China, the absolute increase in manufactures exports was however not achieved through moving up the value chain, that is, increased specialisation in high technology products (such as electrical and computing machinery or communication equipment). In all of the four resource-rich BRIICS, exports of high technology products remained the smallest component of total merchandise exports throughout the 2000s and actually decreased their share during that period (see Annex Figure 6.A2.2).

Moreover, with the rise of China as one of the largest exporters of manufactures, the four resource-rich BRIICS have lost international comparative advantage in some products. The number of export products (including all merchandise goods) in which they have a revealed comparative advantage (RCA) have decreased (Figure 6.7). Taking more advanced economies – like the United States and Japan but also smaller economies like Switzerland

and Singapore – as benchmarks, the recent reduction of diversification in the resource-rich BRIICS is premature and could be a development constraint if the commodity boom comes to an end (see Figure 2.4 in Chapter 2). The richer economies also started a specialisation process, but at a much higher income and diversification levels than Brazil, the Russian Federation, Indonesia and South Africa.

India emerges as an important exporter of services

India's export development during the commodity boom is an outlier in several respects. Unlike all other BRIICS, India shows a significant and increasing comparative advantage in exporting services; in particular computer- and communication-related services (see Box 4.5 in Chapter 4). The share of India's services exports in total exports was more than 35% in 2010 (not reported in Figure 6.6). In all other BRIICS, this share stood below 10% of total exports, except for South Africa where it was 15%, but consisted mainly of travel services.

In India's export structure, like in other BRIICS except China, the share of non-resource manufactures decreased since 2000, while resource-based exports (mainly coke-based fuels) increased in share (Figure 6.6, Panel C). With a share of around 70% in 2012, non-resource-based exports remained however the most important component of exports, where medium- and high-technology products gained relative shares, making up almost half of this component in 2012 (see Annex Figure 6.A2.2).

Also, unlike the natural resource-rich BRIICS, India did not experience a process of reduced diversification since 2000 (Figure 6.7). In fact, India reported a level of diversification (only in terms of merchandise products) nearly as high as China's in 2010, with a RCA in more than 250 products.

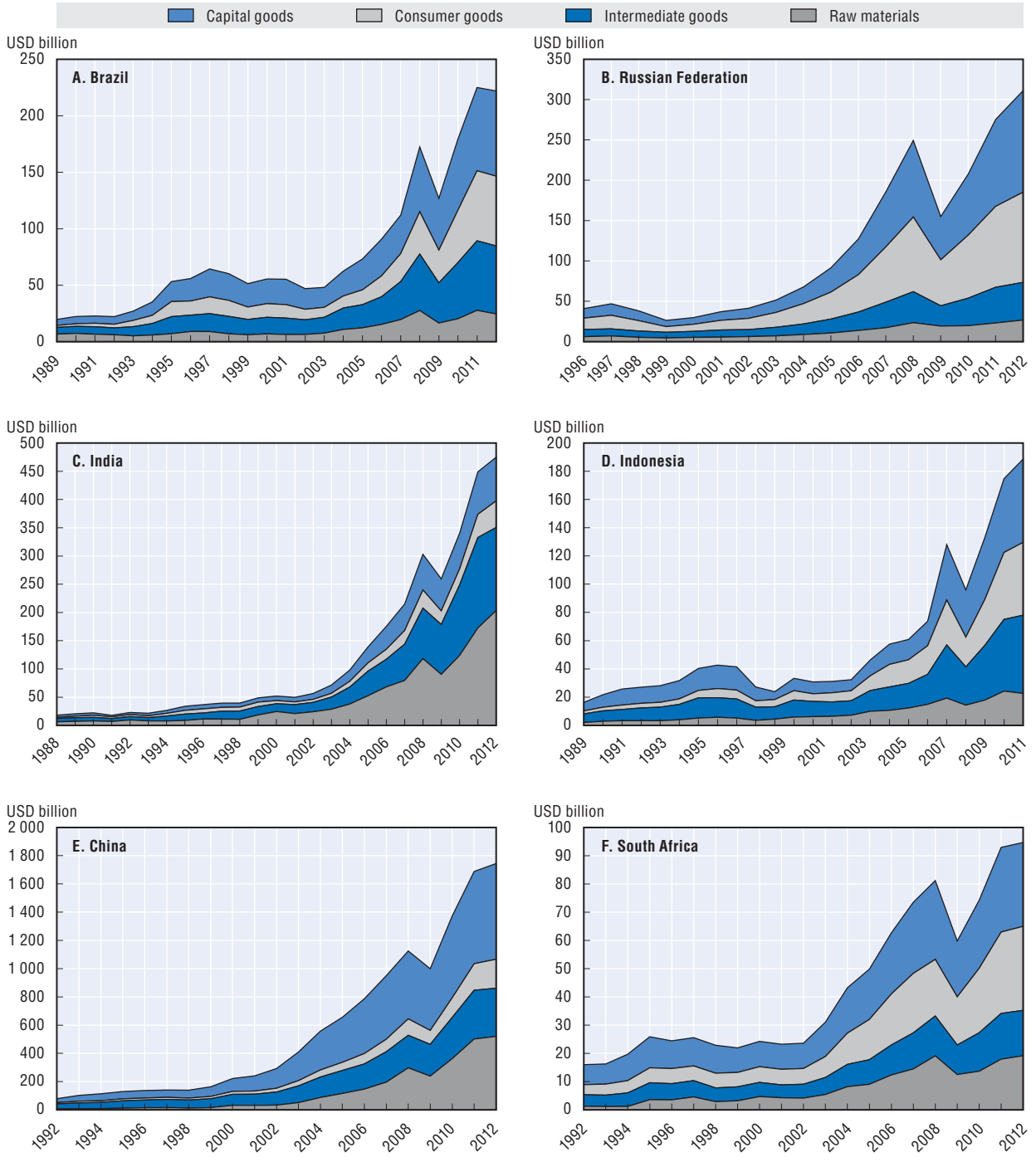
The BRIICS, in particular China, are tapping foreign knowledge through imports

China's transition towards higher value-added exports during the last decade may, among others, be associated with its increasing share of imports embodying foreign technologies in a diverse set of sectors (from electrical and computing machinery to medical and precision instruments and chemicals). The share of capital goods imports has been 40% or more of total merchandise imports between 1995 and 2012 (Figure 6.8, Panel E).

China's example also shows that the development of local capabilities in higher value-added sectors may have been reached by strong integration in global production chains. In fact, China has the lowest average local value-added content in exports (at around 65%) among the BRIICS and is thus considerably integrating foreign knowledge in the production of its exported goods (see Annex Figure 6.A2.3). Part of the lower value-added content of exports in China is also related to the fact that the country is less abundant in resources compared to other BRIICS. Raw materials (including processed fuels) account for almost 30% of imports, up from just above 10% in 2000. At the same time, the share of intermediate imports actually decreased during the last decade, which is consistent with lower shares of exports in low technology assembling activities (see Figure 6.A2.2, Panel E).

Figure 6.8. **India has the smallest share of capital goods imports among the BRIICS**

Imports of merchandise products in USD billion, by product type



Notes: The product type groups are based on UNCTAD's classification (*http://wits.worldbank.org/wits/data_details.html*).
Source: Authors' calculations based on UN Comtrade (2013), *United Nations Commodity Trade Statistics* (database), *http://comtrade.un.org/db/default.aspx*.

StatLink http://dx.doi.org/10.1787/888933059034

Throughout the last decade, imports of capital goods stood at around 30% (sometimes up to 40%) of total merchandise imports in all resource-rich BRIICS (not much below, or similar to, the 40% share in China) (Figure 6.8). In Brazil, the Russian Federation, Indonesia and South Africa, these imports did not translate into a move towards higher-value, non-resource manufactures exports; but were most likely used to develop resource extraction capabilities or capabilities to produce processed, resource-based products (which may also be in the higher value segments). The four countries decreased the share of non-resource high technology exports (see Annex Figure 6.A2.2) and had fewer products in which they have RCA in 2010 compared to 2000 (Figure 6.7). Moreover, the four countries report increasing shares of consumer goods imports (at around 30% of total merchandise imports in 2012) (Figure 6.8), which further illustrates that these countries' economic growth during the last decade has been largely consumption driven (Figure 6.3).

Again, India is a somewhat special case among the BRIICS. Given that it is relatively resource-scarce, the country reported an increasing share of fuels imports since 2000 (at 40% in 2012, above the share of these imports in China) (Figure 6.8). Moreover, the share of intermediate imports was comparatively high (at around 30% of total merchandise imports) since the 1990s. By contrast, India reported the lowest share of capital goods among the BRIICS during the same period. Despite some upgrading towards higher technology products/exports in recent years, the structure of India's imports illustrates their relative specialisation in the lower technology manufactures segments (see Annex Figure 6.A2.2). Finally, almost 30% of total imports were imports of services (mostly computer, communication and transport services) in 2010 (not reported in Figure 6.8). The example of India's success to export services illustrates that the development of comparative advantages in exports often comes together with the international integration through imports. Among the BRIICS, Brazil and the Russian Federation also reported relatively high shares of services imports, again particularly in computer and communication services. In line with the argument above, these two countries also developed some comparative advantage to export these services, although at a much lower scale.

Brazil

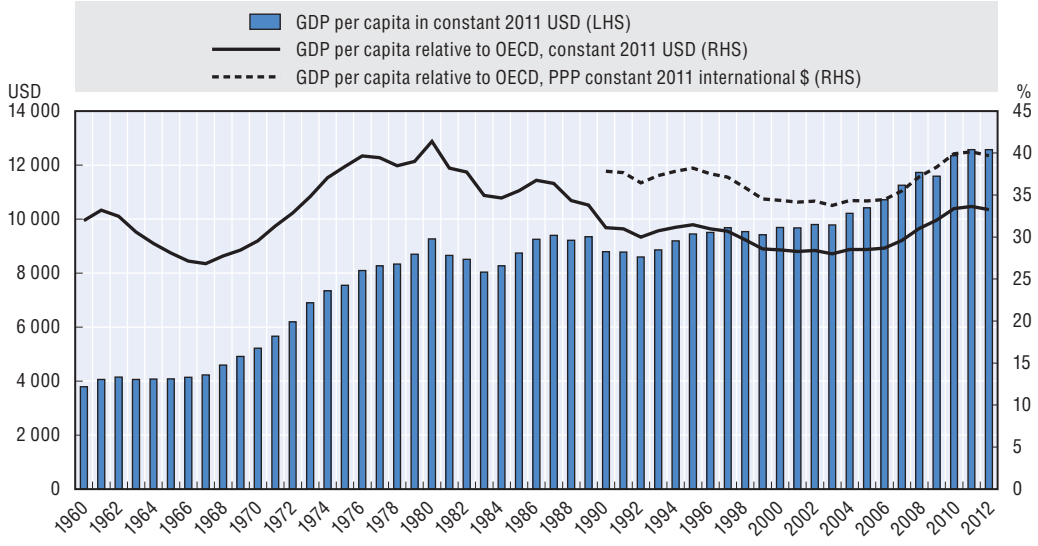
Brazil experienced an impressive development trajectory in the 1960s and 1970s, but growth was stalled for almost two decades following the second oil shock of 1979. Over the last decade, growth has picked up on the back of robust demand for commodities, but for this to be sustainable, stronger productivity growth and faster capital accumulation are needed. Productivity is still lagging well behind levels of advanced countries and so is capital stock in per capita terms.

In the social and environmental dimensions, Brazil has made massive improvements during the last decade. Among others, it has expanded employment opportunities for its population and is now almost at full employment, which has also significantly decreased income inequality. Moreover, the country has almost eliminated deforestation – an important environmental development challenge – in the last couple of years and now generates more than two thirds of its electricity through renewables.

History and development path

Brazil had its high growth period between 1964 and 1980, with an average growth rate of almost 8% and significant convergence of per capita income towards OECD levels. During this period real GDP per capita in Brazil relative to the OECD average increased significantly, reaching above 40% in PPP terms in 1980 (Figure 6.9). After this Brazilian "economic miracle" the GDP per capita gap relative to the OECD economies worsened. The country only recently resumed convergence towards OECD incomes.

Figure 6.9. **After a long period of divergence, income convergence (relative to the OECD average) has recently resumed in Brazil**



Source: Authors' calculation based on World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933059053

Among other things, the "miracle" could have owed its success to an import substitution strategy, characterised by high import tariffs and sector-specific import licences, complemented with a variety of measures: large subsidised credits to manufacturers; access to imports for capital goods at an overvalued exchange rate; incentives to foreign direct investment (FDI) in manufacturing; a rise of investment in transport, energy and telecommunications infrastructure; and the development of state-owned enterprises (De Holanda Barbosa, 1999; Pinheiro et al., 2004).

The underlying weaknesses of Brazil's expansionary and import substitution strategy were revealed after the second oil shock of 1979. In addition to rising energy prices, Brazil was faced with declining terms of trade due to falling export prices, increases in the price of imported capital goods and raw materials and an increase in international interest rates resulting in a deep debt crisis. While Brazil is becoming less dependent on oil imports due to the recent discovery of oil fields, the lack of domestic energy supplies after the second oil shock was responsible for a particularly deep crisis. Since 1980, Brazil has been experiencing a process of deindustrialisation, with the share of manufacturing in GDP decreasing from almost 20% to just above 15% in 2012.

At the beginning of the 1990s, the business environment improved through trade liberalisation, privatisation, an end to price controls, and a reduction in red tape. These structural reforms together with the introduction of a new monetary unit linked to the United States dollar – the Brazilian real – lifted economic growth.

Challenges

Economic growth in Brazil over the last decade was mainly driven by domestic consumption. Exports as share of GDP were relatively small in Brazil compared to other BRIICS. Nevertheless, export growth over the same period was strong due to strong demand for Brazilian commodities from China and other emerging countries (part of the "shifting wealth" process). The export share of ores, metals, fuels and agricultural commodities has increased rapidly, while the share of manufacturing exports decreased from almost 60% to 35% during the last decade. During this process, the country also expanded capabilities and moved up the value chain in the resource sectors, particularly in agriculture.

Brazil has also well-diversified manufacturing sectors (Canuto et al., 2013). However, insufficient international competitiveness prevents these sectors from being engines of growth. Although the productivity level in manufacturing and services in Brazil is still relatively high compared to, for example, India and the Russian Federation, productivity growth is stalling in services and even negative in manufacturing (see Figure 6.5 above). Economy-wide productivity improvements have also been too small to cope with significant wage increases resulting from a tight labour market and continued skills shortages (OECD, 2013a).

In particular, competitiveness – and thus convergence – in Brazil may be constrained by bottlenecks in qualified human resources and infrastructure, high administrative costs and the protection of local industries. Moreover, the fast pace of inequality reductions needs to continue, which will also improve trust in government institutions. In the environmental dimension, recent achievements to almost eliminate deforestation need to be sustained.

Educational attainment improved recently

Educational attainment has been improving in Brazil, especially among the younger generation from low-income backgrounds. This has recently led to higher average PISA scores (OECD, 2013b), although they are still below the OECD average and those in other middle-income countries, such as Argentina, Mexico and Turkey.

The rather limited economy-wide labour productivity improvements during the last decade were driven equally by a shift of labour to more productive sectors and productivity gains within sectors (see Chapter 1, Figure 1.10, for details). To increase the pace of productivity improvements, skills need to be developed and strengthened to meet specific needs in higher productivity sectors. Among others, this may be achieved through further improvements in access to vocational training. The enrolment in vocational training has doubled in the last ten years and the government has recently strengthened its efforts in this area; the enrolment rate in vocational training remains however very low compared to the OECD average (OECD, 2013a).

Additionally, more inclusive access to high quality tertiary education would likely facilitate the upgrading process in all sectors. Quality in public secondary schools tends to be lower than that of private secondary schools. Graduates from public secondary schools may thus have more difficulty to get into high-quality public universities compared to graduates from private schools (OECD, 2013a). Quality shortcomings are partly related to short schools days. Many public secondary schools schedule up to three daily shifts to compensate for a shortage of class rooms.

Investment in infrastructure should be expanded

Improving productivity and efficiency is also constrained by infrastructure bottlenecks in roads, railways, ports and airports. Some estimates put the infrastructure stock in Brazil at 16% of GDP in 2012, much lower than the 55% in India and the 75% in China (Dobbs et al., 2013). Capital stock in per capita terms (including infrastructure, real estate and business capital) is slightly higher in Brazil than in India and China, but falls clearly behind the OECD average (Berlemann and Wesselhoft, 2013).

Despite the apparent need for more infrastructure, investment during recent years was still low (OECD, 2013a). Also more broadly, physical investment including infrastructure, real estate and business capital investment as a share of GDP at around 20% was low compared to the shares in the Asian BRIICS, for example (Figure 6.2). Moreover, efficiency in capital accumulation is falling in Brazil (see Chapter 1, Figure 1.8, for details). This may partly be due to the recent housing boom, which less directly translates into output growth than investment in infrastructure or business capital. However, investment in infrastructure may also be inefficient. While the recent Growth Acceleration Programme has led to a rise in infrastructure investment, particularly in highways, many projects under this programme remain unfinished due to financing problems or are delayed due to planning difficulties (Credit Suisse, 2013).

Administrative burdens, taxes and international trade costs are high

Administrative burdens for businesses in Brazil are high compared to international standards according to OECD's Product Market Regulation Index and World Bank's Ease of Doing Business Index. Among the BRIICS, only India and Indonesia do worse. Within Latin America, Chile, Colombia and Mexico rank ahead of Brazil. For example, starting a business

in Brazil requires 13 procedures and takes almost four months. In Chile, Colombia and Mexico, this can be accomplished in less than two weeks with fewer procedures.

The tax burden for Brazilian firms is similarly high. According to some calculations, almost 70% of commercial profits go to taxes (including all taxes on income and factor usage) (World Bank-PWC, 2013). This is the highest rate among the BRIICS and considerably higher than in developed countries like Germany or the United States, with rates below 50%. Moreover, the Brazilian taxation system is complex. A fragmented system of indirect taxes and a need to comply with various tax codes make compliance costs for firms very high (OECD, 2013a).

In addition, costs of trading internationally are high in Brazil. Trade costs in India, China and developed countries such as Germany and the United States are much lower than in Brazil (ESCAP-World Bank, 2013). Although tariffs are relatively high compared to the other BRIICS and other countries in Latin America, the bulk of trade costs have non-tariff origin (including non-tariff-border and behind-the-border measures as well as transport and logistics costs). As an example for behind-the-border measures, for urban transport projects under the Growth Acceleration Programme in Brazil, 80% of selected manufactured goods and engineering services have to be domestically sourced, even if it increases the cost of the transport investments (OECD, 2013a).

Inequalities were reduced recently

Brazil made significant improvements in the area of social inclusion during the last decades. Employment has increased importantly (Figure 6.4, Panel A and Figure 2.1 in Chapter 2), income inequality was reduced considerably (see Annex Table 6.A2.2) and the middle class has expanded. This process was supported by education and labour market reforms. Moreover, social transfers, such as the conditional cash transfer programme Bolsa Familia, reduced poverty and thus also supported the reduction of inequality (Rasella et al., 2013 and Santos et al., 2011).

However, inequalities of income as well as of access to high-quality public services such as education remain high. The Gini coefficient of income inequality, for example, improved from 61 in 1990 to 53 in 2012, which is still considerably higher compared to most of the BRIICS (South Africa is an exception). Inequalities in Brazil vary considerably by region, with the North and Northeast historically performing worse. Recent improvements in educational attainments in these poorer regions are likely to support reductions in regional inequalities (OECD, 2013b).

Citizens' expectations for further opportunities to move up the social ladder as well as discontent with public institutions may have led to recent demonstrations against the government. According to the Latinóbarometro 2011 more than 60% of the Brazilian public has little or no confidence in the federal government, even more do not trust local governments and about 50% do not trust private enterprises. Building trust in public and private institutions by consolidating support among stakeholders thus also becomes increasingly important.

Deforestation was reduced drastically

Deforestation, especially in the Amazon River Basin, was one of the biggest environmental challenges facing Brazil in the past. The abundance of natural resources brought many migrants to the Basin during the Brazilian "economic miracle" before

the 1980s and this led to significant infrastructure expansions, including the development of extractive industries. Deforestation continued at a significant pace in the 1990s and the beginning of the 2000s; the forest area was reduced from almost 70% of total land area in 1990 to around 63% in 2005 (World Bank, 2013a). From then onwards, deforestation was reduced drastically every year. Since 2009, the forest area remained almost constant. This achievement is significant and important for the environment worldwide given that Brazil makes up for more than half of the world's remaining rainforests (Entrust Global Partners, 2010).

Brazil's energy consumption is largely based on renewable energy resources. Over 70% of its electricity generation originates from renewables – largely hydro. Brazil has been very successful in the production of biofuels (that is, sugarcane-based ethanol) and the commercialisation of it, particularly in the transport sector. Most cars can run on any combination of ethanol and gasoline. This has also resulted in the elimination of lead from gasoline, thus greatly improved air quality in cities.

CO_2 emissions per capita are increasing in Brazil, but levels remain considerably below those in China and more advanced economies (World Bank, 2013a). Moreover, Brazil has the lowest energy use per unit of GDP among the BRIICS (Annex Table 6.A2.3), at par with the OECD average.

Low CO_2 emissions in Brazil may not be sustained in the future due to the exhaustion of hydro energy options outside of the Amazon. If Brazil needs to expand energy generation, the country will be challenged between the expansion of hydro energy in the Amazon, more costly options of renewable energies (such as wind and solar) and less environmental friendly options. Given worldwide interests to preserve Brazilian forests, this challenge is a matter of debate more internationally, not only in Brazil.

Considerations moving forward

The chances for a successful catch-up in competitiveness are high. However, Brazil's population is ageing quickly and by 2050 will have a median age of 44 (see Chapter 1, Figure 1.9, for details). Therefore, getting on the sustained convergence path now requires a faster and more broad-based accumulation of human and physical capital and further improvements in the business environment. Tackling these challenges may become more burdensome once the working population is shrinking. A governance system prepared to make these structural adjustments would also rebuild public trust and satisfy its emerging needs.

Moving-up the value chain in agriculture, manufacturing and service sectors would allow Brazil to reach a more sustainable development trajectory and reduce natural resource dependence. Given Brazil's strong agricultural commodity sectors, the development of agro-related activities (including services) may be one area through which Brazil can reach further growth. Productivity growth in these sectors has already been significant over the last decade.

Brazilian authorities are not short of revenues. General government revenues as a percentage of GDP were around 25% in 2011 (including taxes, social contributions, fees, fines, rents and other revenues, except grants), at par with the OECD average (World Bank, 2013a). However, current allocations of public funds may not allow for a sufficiently rapid accumulation of human and physical capital. Brazil may need to find a better balance of relative allocations of funds between levels of education to ensure future quality human

resources at all levels. Investments into primary and secondary education are important. Despite relatively high overall government spending on education – above the OECD average (OECD, 2013c) – primary and secondary education as compared to tertiary education is underfunded. Furthermore, Brazil may wish to rethink its pension system. Reducing the fiscal burden of the pension system would free up funds for important investments in infrastructure and education directly affecting Brazil's productive capacity.

It is welcome that the government's 2013 oil royalty bill designates all resource royalties from future oil extraction in newly discovered offshore fields – which is likely to be extensive – to education and healthcare. Properly managing these revenues will be key. Brazil's royalty law could benefit from adopting some features of the royalty systems in Colombia (see Chapter 5, Box 5.4, for details) or Chile. Among others, this may include increased allocation of royalties for productivity-enhancing projects in non-resource sectors. Moreover, the experience with stabilisation funds in Norway and the Russian Federation could be helpful.

Red tape could be reduced by a single-window system as it is often used in the area of international trade. This would allow parties involved to lodge standardised information with a single-entry point to transit-related regulatory requirements for domestic and international trade. Such entry points would also be useful for starting businesses and enforcing contracts.

There is scope for reform in corporate taxes. For example, the system of indirect taxes for businesses could be consolidated into a single value-added tax. The recently introduced turnover-based social security contributions may have unintended consequences: taxing turnover reduces the incentives to start businesses where the value of inputs used as compared to value added is particularly high. This applies for example to agro-related processing.

Local content requirements in publicly financed projects and other behind-the-border barriers may support selective industries, which may not have competitive edges in Brazil. The government could consider removing these barriers as the competition with foreign rivals may lead to productivity gains.

Moreover, improving the business environment along these lines could increase private investment – which is currently relatively low in Brazil – and thereby accelerate the accumulation of capital.

Russian Federation

In 2013 the Russian Federation was classified by the World Bank as a "high-income" economy. Nonetheless, the country still faces a number of challenges typical of middle-income countries. While the prospects of future growth allow for a relatively rapid convergence in per capita incomes with advanced economies, it may be vulnerable to shocks as it depends heavily on commodity exports. Furthermore, not everyone has benefited from this rapid growth and production is highly energy intensive. To avoid a sustained growth slowdown, productivity needs to be boosted. Further reforms may be undertaken to improve the business climate and energy efficiency.

History and development path

Since the early 1990s, the Russian Federation has been a transitional economy endowed with natural resources. The 1990s were marked by political and economic turmoil, instability and deindustrialisation, and in 1998 there was a financial crisis. Following this period, growth accelerated significantly. From 1999 to 2008, real GDP expanded at an average of about 7% a year. Coupled with a gradual decline in the population, per capita GDP grew even faster and was converging rapidly towards OECD averages. Absolute poverty levels fell dramatically: absolute poverty calculated according to regional subsistence level decreased from 26% in 2000 to 3% in 2009 (Denisova, 2012), and the poverty headcount ratio (with a threshold at USD 2 a day, PPP) was only 0.1% in 2009 (10.5% in 1999) (Annex Table 6.A2.2).

Beyond the recovery from the low levels of economic performance in the 1990s, the main drivers of the Russian Federation's economic development have been the rise in natural resource prices, stronger macroeconomic fundamentals and the high growth in labour productivity (see for instance Figure 2.1 in Chapter 2) associated with restructuring, reorganisation and foreign direct investment (FDI) in some sectors. These factors contributed to a steady decrease in unemployment and booming private consumption associated with rising terms of trade. In the 2000s, services developed faster than in any OECD country. In 2012, the share of services in total value added was 60%, slightly higher than in India, but lower than in Brazil or South Africa. The share of industry (including mining and quarrying) was 36% higher than the world and OECD averages, but lower than in China or Indonesia.

Challenges

There is a risk that the Russian economy may be too dependent on natural resources and not sufficiently diversified, since a large part of exports in value terms are natural resources. The extent of diversification remains low and is one of the biggest challenges to development. However, despite high oil revenues in the 2000s (until the 2009 shock), associated real appreciation of the ruble and high increases in real wages as well as decreasing employment in manufacturing sectors (in favour of services sectors), the Russian Federation did not suffer from all the Dutch disease patterns. World market shares of manufacturing exports showed slight increases, due to large labour productivity gains: labour productivity in the manufacturing sectors improved, particularly in the manufactures of machinery and equipment, rubber and plastics products, chemicals, food products or tanning and dressing of leather (see Annex in Chapter 3). However, world market shares of manufacturing exports remain relatively low when compared with successful export-led economies in, for example, Asia.

Avoiding a sustained growth slowdown

Although growth recovered quickly after the 2008 shock, there are concerns about a possible sustained slowdown in growth. The high rates of growth in the 2000s were linked to the rise in hydrocarbons revenues – triggered by the "shifting wealth" process – and the rise in domestic consumption, partly linked to large increases in wages, rising terms of trade and recovery from low levels of economic activity in the 1990s. These drivers of growth may progressively run out of steam, as natural resource prices may not continue to increase according to past patterns. For consumption to remain a large sustained driver of growth, it must be accompanied by productivity increases. Indeed, growing consumption can be afforded by raising wages that can be underpinned by continual increases in labour productivity, should competitiveness not be hampered.

There is some room for further factor accumulation (in particular for capital accumulation), and improvement in capacity utilisation and sector shifts. Labour inputs, on the contrary, are unlikely to be a major source of growth. The Russian Federation has an ageing population, despite a recent increase in birth rates. Total dependency ratios are expected to increase from 39 in 2010 to 60 in 2050. Although still more favourable in terms of both elderly- and child-dependency compared to Brazil or China, this will constrain further growth. Furthermore, unemployment is currently low, which gives little room for improvement in employment levels, hence for increased labour utilisation. Conversely, the accumulation of the capital stock may contribute to further catching-up. Although it has risen gradually in the 2000s, investment as a share of GDP has been relatively low compared with other fast-growing converging economies such as China or India, and per capita capital stock is still low compared with the OECD average. To some extent, there is also room to increase capacity utilisation (currently around 65%) – although it is close to its highest level since the beginning of the 2000s – and to benefit from sectoral shifts of labour towards more productive activities. As the urbanisation rate is relatively high (around 74% in 2011, compared with 62% in South Africa, 51% in China and Indonesia, 31% in India, but 85% in Brazil), the gains from the shift of labour from agriculture to manufacturing will be more modest than in other emerging or developing economies which are rapidly urbanising.

The greatest source of further convergence in income levels with the OECD average is expected to be productivity catch-up within sectors. Currently, the gap in GDP per capita with the OECD average is indeed almost entirely due to a gap in productivity, as labour utilisation is very high due to high participation rates and low levels of unemployment (see for instance Figure 2.1 in Chapter 2). Although productivity caught up dramatically in the 2000s, the gap remains large (see Figure 3.1 in Chapter 3 for the productivity gap in manufacturing sectors, and Figure 4.8 for the productivity gap in selected service sectors).

Economic development needs to be driven by diversification and quality upgrading

In recent years Russian decision makers have increasingly emphasised the importance of upgrading the economy through increased productivity and innovation-led activities, stressing the need to reduce the dependence on oil revenues and diversify the economy. The government's long-term strategy "Concept of Long-term Socio-Economic Development of the Russian Federation for the Period up to the Year 2020" sets out a framework for the Russian Federation to become a country of high living standards, innovative and competitive on the global level. It is recognised that this involves consolidating existing comparative advantages and, at the same time, creating new ones. In this context, joining WTO has created opportunities to access new markets while increasing competitive pressures stemming from foreign competition.

How to boost economic diversification and better benefit from natural resource revenues need to be addressed. Current issues for upgrading and diversification of the economy include the possible use of existing industrial conglomerates to foster innovation and diversification, or the reliance on new sectors or activities, in particular through the improvement of the business climate. Creation of innovation-oriented special economic zones (SEZs), innovation clusters and technology platform (see Box 4.6 in Chapter 4 on the Skolkovo Innovation Centre) is being encouraged to improve spill-overs.

There is ample room for increases in productivity and technology absorption as the main drivers of further growth. Some businesses have managed to achieve strong productivity performance, enabling them to provide good wages, working conditions and training to their employees. Others, however, are surviving mainly because of entry barriers and geographical isolation that segment markets by regions and limit competition among firms (OECD, 2011a). There is hence room for productivity improvements in many firms. Absorption of technologies, beyond the high-techs, across firms could also be fostered. For instance, despite high technological potential and good education, the Russian Federation shows an export structure that is more oriented towards medium- and low-tech products, whereas high- and medium-high tech products account for less than one-fifth of total manufacturing exports and manufacturing exports make up a small proportion of total exports. Regarding technology absorption and upgrade, there could be also better incentives for a number of manufacturing sectors to improve energy efficiency. Indeed, in addition to saving energy and improving environmental outcomes, this could also have the side effect of fostering technology development, as more advanced technology tends to be less energy intensive.

Investment levels still need to be boosted, but the allocation of funds has been improving. Increased investment, especially in innovative activities, technology and modern infrastructure would speed up the renewal of the capital stock and potentially boost the technology content of capital goods. Beyond this, a favourable investment climate would strengthen incentives for investment. Growing investments could have significant impacts on the economy. In contrast to many OECD and emerging countries, the efficiency of the allocation of funds is improving. This is exemplified by the decreasing trends in incremental capital output ratios (ICORs) and reflects, in part, an efficiency-driven consolidation drive within the financial sector. There is room for efficiency improvement in the financial sector through on-going consolidation and increased competition through foreign entry.

Competition and entrepreneurship should be strengthened to boost productivity. Most industries in the Russian Federation are still dominated by a few very large players, a legacy of the communist regime. There is, however, a growing population of small- and medium-sized enterprises (SMEs), although the contribution of SMEs to GDP is about half of that observed in the European Union (EBRD, 2012). The government's measures to reduce barriers to market entry and entrepreneurship and improve access to infrastructure may have contributed to this.

Governance mechanisms and capacity need to be improved

Despite improvements in the 2000s, there is still a need to reinforce efforts in governance to improve the business climate, which still lags behind OECD countries. Indeed, the Russian Federation scores poorly on a range of indicators of the business environment, as reflected by low levels of competition, sluggish innovation and low

investment (OECD, 2011a; OECD, 2011b). For instance, property rights and international contracts should be better enforced to raise the Russian Federation's investment profile and boost investment. Regarding large firms, corporate governance and transparency need to be further strengthened. There is also the need to strengthen the overall independence of the judicial system. Law-enforcement agencies could be made more transparent and accountable to limit room for undue influence. Corruption should also be fought more effectively. Despite ratification of the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions and an increased focus on fighting corruption, the issue remains a challenge. On the 2013 Corruption Perceptions Index compiled by Transparency International, the Russian Federation ranked 127 of 177 countries, behind all other BRIICS.

Capacity within the government should also be improved to increase efficiency in public services and enforce the rule of law. A number of recent reforms have been implemented to improve performance of the civil service.

Labour market fragmentation needs to be addressed and skills improved

Labour markets are relatively flexible, levels of unemployment are low and worker turnover is high. Worker turnover is high primarily because workers quit voluntarily to look for better jobs. Real wages (instead of employment) remain the main adjustment mechanism in the labour market, given that up to half of an employee's wages is linked to the performance of their firm, although a significant increase in the minimum wage introduced in January 2009 has probably jeopardised the expected downward flexibility of wages during economic downturns (OECD, 2011c).

The Russian labour market, however, remains segmented and more could be done to bring social protection up to the standards of more advanced countries. For instance, the share of non-standard, mostly temporary contracts rose significantly in the 2000s and, as in OECD countries, workers on these atypical contracts tend to be the first to lose their jobs in downturns. Informal employment remains however much lower than in the other BRIICS.

The population is well educated with very high rates of tertiary attainment. Despite this, there is still a gap in spending on education below the tertiary level and the flexibility of tertiary and vocational education could be improved to provide the skills needed for upgrading the economy. For instance, stronger co-operation involving business may be useful, and internships could be developed. By 2020, government spending on education and research and development is to rise significantly and a new law on education aiming at adapting curricula is being implemented. In addition, lifelong training should be encouraged since transformation in the economy may be rapid and make some jobs obsolete. The government has a key role to play in this, as firms may have few incentives to finance the training of employees who could later be hired by competitors.

Social cohesion issues are diverse, but generally not linked to exclusion as in other BRIICS

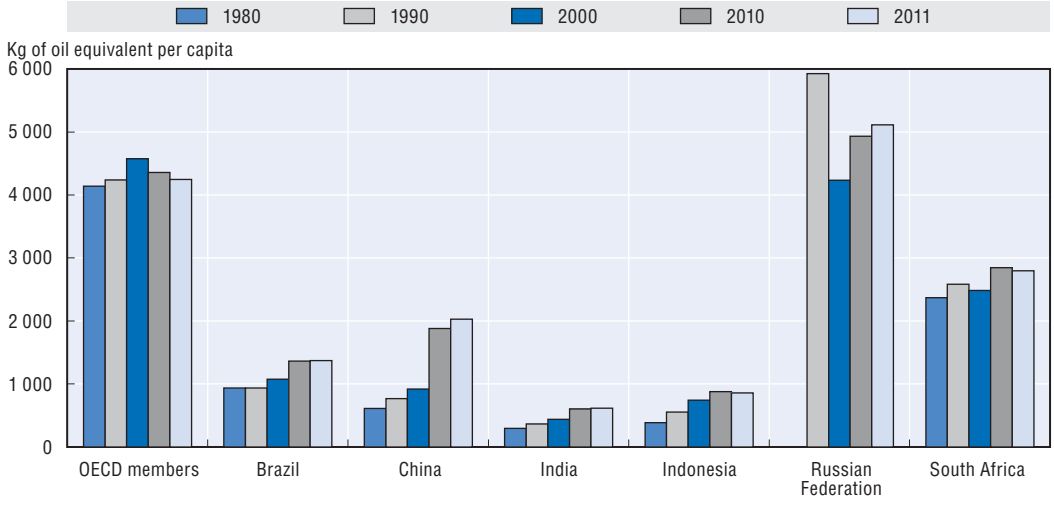
Recent tensions have been associated with the rising middle class, as witnessed by challenges following the 2012 presidential elections. Some of these tensions arose from within the better-off middle class in urban centres, a class that is increasingly willing to take a stronger voice in the decision-making process. Therefore, in order to decrease the possible tensions which may arise, the government needs to be more transparent in its decision-making and increase efficiency in fighting corruption.

Although absolute poverty rates are now close to zero, income inequality remains a challenge (see Annex Table 6.A2.2). The Gini coefficient rose slightly from the beginning of the 2000s, started to decline after 2007 but remains higher (40 in 2009) than in all of the OECD countries. However, the lower strata of the Russian middle class is better off than in most emerging economies and enjoys better access to free public services. Inequalities are partly due to regional variation in earnings related to geographical differences in living costs and the wage premium in some regions in the Far North and in Siberia (OECD, 2011c). Nevertheless, flexible labour markets revealed the vulnerability of the lower strata of the middle class during the 2008 shock, in particular those from comparatively poor families who have moved to large cities from rural areas or middle-sized cities.

Environmental and energy efficiency challenges remain high

Land and water resources experienced degradation during the Soviet period. Environmental challenges continue and are due in part to the continued existence of large and highly energy-intensive industrial conglomerates and to citizens' habits regarding the use of energy, encouraged by low energy prices. Examples of cities where pollution has led to health problems have been widely advertised to raise public awareness and there is a growing recognition of the issue. Low energy efficiency and the high carbon-intensity of the economy have been major factors in poor environmental outcomes. The energy intensity of GDP in the Russian Federation is among the highest in the world (Figure 6.10), and the CO_2 emissions from fuel combustion per capita is also higher than the OECD average (11.0 tonnes versus 10.2 tonnes in 2011). There is high energy intensity in the manufacturing sector due to inefficiencies and, to a lesser extent, industry structure. Energy efficiency improved in the last decade (see for instance Figure 3.19 in Chapter 3, referring to the energy use in manufacturing), but there is a lack of investment in energy savings. This is due in part to past dependency linked to industrial conglomerates and to moderated prices for energy (prices for fossil fuels are much lower in the Russian Federation than in world markets). While the

Figure 6.10. **Energy use in the Russian Federation is comparatively high**



Source: World Bank (2013a), *World Development Indicators* (database), World Bank, Washington, DC, *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933059072

hydrocarbon endowment is an asset and provides a competitive advantage for industries, the price for energy may be progressively increased as this can provide an incentive to invest in technologies, and hence to increase overall productivity.

Considerations moving forward

The Russian Federation should take advantage of its natural and human capital to narrow the remaining productivity gap with more advanced economies in the manufacturing and services sectors.

Boosting investment and competition would lead to diversification and upgrading. Although barriers to entrepreneurship decreased significantly, state involvement in the economy remains relatively high, through regulation and SOEs, and competition could be strengthened. Furthermore, the nature of government interventions is sometimes difficult to foresee, leading to a perception of unpredictable markets and opportunities for corruption. Property rights and the business climate could be improved through improvement of the legal system and clarification of the involvement of the state in private activities.

For long-term and risky investments, the state could share the risks that private actors are reluctant to take, so as to boost private investment. Investment is needed in modern infrastructure (including transport) and in technology. Part of the benefits of natural resource exports could be used, under tight monitoring, to decrease the risks taken by private investors. Supporting investment and acquisition of technologies by a large number of firms, for instance by establishing credit guarantee schemes, could also foster technological diffusion and upgrading. Increasing private investment in R&D may also be fostered through tax credits, provided that there are no undue profits. At the same time, while inflation targeting may be included in the next years, accumulation of reserves and investment abroad would mitigate possibly excessive real appreciation of the ruble that may occur due to Dutch disease effects.

Integrating in value chains and facilitating technological diffusion would increase competitiveness. This could be achieved with increased opening to international trade (first by removing the remaining barriers to trade in intermediate goods), acquisitions abroad and customs unions. Competition and trade policy could work in tandem to discourage rent-seeking behaviour and help improve the position of Russian businesses in global markets. At the same time, education and training policies could focus on private sector needs to help secure the supply of skilled labour and an efficient allocation of the human resources required for more knowledge-intensive productive activities.

Strengthening capacity and governance mechanisms would allow for more efficient state interventions and approaches to fighting corruption. Increasing transparency and accountability mechanisms can help with this. At the same time, public expenditures are still relatively low as a percentage of GDP, compared to OECD countries: total government expenditures are around 36% of GDP in the Russian Federation, compared with around 42% for the OECD average. While continuing to secure business-friendly tax treatment, the government may consider progressively raising some taxes (e.g. property taxes, or taxes on alcohol and tobacco) to procure resources for social transfers and public investment and to raise wages for civil servants (this would also allow for skills retention and help avoid corruption).

India

India has achieved impressive growth in the last two decades which lifted large parts of the population out of poverty. The prospects for achieving continued growth are good, provided that some challenges can be overcome. Employment in agriculture is still at high levels and productivity has ample room to improve across all sectors. Further accumulation of physical and human capital is essential for continued income growth. This will require higher educational attainment as well as regulatory reforms to foster enterprise growth and provide jobs for the growing labour force.

History and development path

India pursued a strategy of inward-oriented industrialisation after independence and maintained a closed and highly regulated economy until the 1970s. Centralised planning was used to support remote or underdeveloped regions through, for example, granting licenses or allowing output increases only for firms in such regions. Centralised planning was also used to align production with national social and economic policy objectives. In the 1970s, the green revolution in agriculture (introducing chemicals and new seeds) increased agricultural productivity and initiated structural change.

After a very restrictive post-independence economic regime, India benefitted from broad-based deregulation and reforms in the 1980s and 1990s that led to accelerated growth. During the 1980s, India started limited reforms. In 1991 as a result of a major economic crisis the government implemented large-scale reforms across a range of areas. Trade tariffs were cut, licensing requirements and capacity limits for private sector firms were abolished, and many key service sectors, such as banking and telecommunications, were opened up for private competition. These reforms paved the way for structural shifts: between 1990 and 2012, the share of agriculture in output decreased from 29% to 17%, while the share of services increased from 45% to almost 60%. Productivity in many sectors increased, but from a very low level.

India also undertook an early push for high quality tertiary education with the establishment of the Indian Institutes of Technology in the 1950s and 1960s. This helped to establish an advanced service sector that today produces an unusually high share in GDP of trade in services, compared with other BRIICS countries. More recently, the focus has shifted to achieving universal primary education and improving secondary and vocational education to achieve a better skills-match with the needs of the private sector.

Liberalisation of the service sector led to the entry of new firms into the market and improved growth in many services activities. Business services (including IT services) especially experienced fast growth during the 1990s, also contributing to the growth of exports (OECD, 2011c). The improved productivity and availability of services also helped to fuel manufacturing growth, especially in sectors relying strongly on services as an important input (Arnold et al, 2010). In addition, manufacturing industries benefitted from increased access to intermediates after trade liberalisation, followed by FDI inflows in the 2000s.

In 2012, India had a per capita GDP (in PPP terms) of USD 3 340, which puts it in the category of lower-middle income countries. The growth rate averaged 5.5% during the last decade. If the country continues to grow at this pace, it will converge to OECD levels within

the next 50 years. Nevertheless, the recent growth period still leaves room for further factor accumulation and for improvements in technology use.

India has recorded impressive economic growth in recent years, which lifted large parts of the population out of poverty. In 1994, nearly 50% of the population was below the USD 1.25/day poverty line. This share had reduced to just over 30% by 2010. Solid macroeconomic policies coupled with high household savings rates facilitated capital accumulation. Complemented by a young population, the preconditions for sustained growth are favourable, although reforms will be important for sustained structural change and productivity growth.

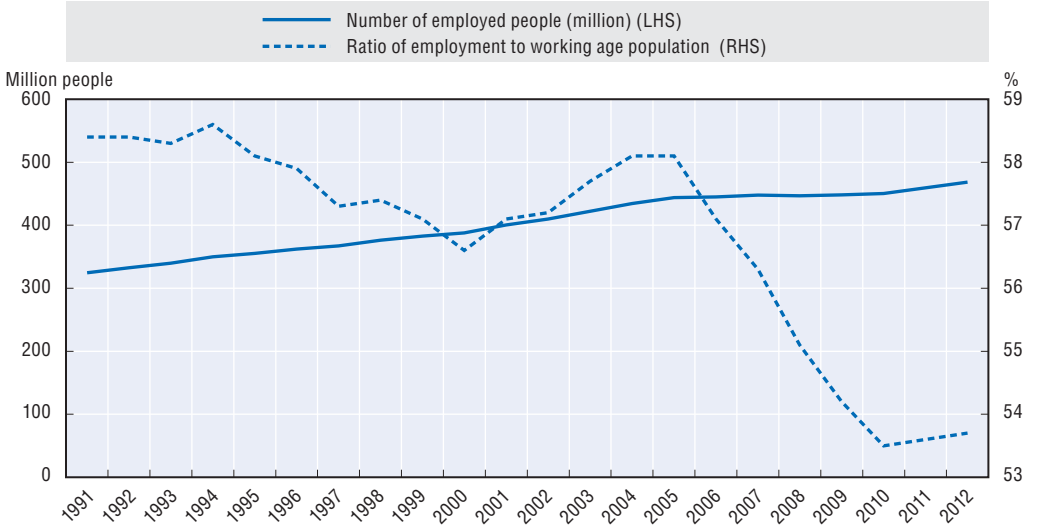
Challenges

Overall productivity growth, driven mostly by improvements within firms, but partly also by reallocation between firms (Chapter 3, Figure 3.3) has raised per capita GDP to the (lower) middle-income category. Income growth helped to lift many people out of poverty, but absolute poverty levels remain high. This is partly driven by a large share of employment in agriculture, as well as low educational attainment levels and skills mismatches. Beyond these, the private sector is still subject to numerous constraints on the supply-side (e.g. energy resources, infrastructure, and regulatory burdens). At the same time, corruption remains a problem and reforms are notoriously hard to implement.

Taking advantage of the demographic dividend will require improvements in education

In terms of human capital, India's economic growth could benefit significantly from the demographic dividend, if this potential can be realised through higher educational attainment and sufficient job creation. At present, the country is not creating employment at a fast enough rate (Figure 6.11). The country has a young population with a dependency rate of 53% of the working age population, but the majority of this (a total of 45%)

Figure 6.11. **Employment in India has been increasing, but not fast enough to keep up with the growing population**



Source: ILO (2013), *Key Indicators of the Labour Market (KILM)* (database), *www.ilo.org/empelm/what/WCMS_114240/lang–en/index.htm.*

StatLink http://dx.doi.org/10.1787/888933059091

comprises young dependents, indicating that in future years a large number of young people will enter the labour force. The demographic dividend will materialise if the country manages to put them into productive employment. Currently, the agricultural sector accounts for 51% of employment. If labour can be shifted to higher-productivity sectors in agriculture, manufacturing and services, general productivity growth could be enhanced.

Potentially the biggest obstacle to fully realising the demographic dividend is the currently low level of educational attainment. India put an emphasis on reinforcing tertiary education early in its development through (often exclusive) high-quality universities, which in turn contributed to the country's growth in business (and especially IT services) – but primary schooling levels are comparatively low. In 2010, 39% of the population under 15 years old had achieved some kind of secondary education, but only 1% completed secondary education, which puts India below all other BRIICS countries (Barro and Lee, 2013).

In 2009, the government passed the "Right of Children to Free and Compulsory Education" Act. Government investment in public schools is complemented by the entry of many private schools. In 2012, more than 28% of enrolled children aged 6-14 attended private schools (ASER Centre, 2012). Even though some of these explicitly cater to poor students with low costs, the annual government study indicates that private schools provide education comparable in quality to public schools. Quality of education is a problem, with weak student attendance in many areas as well as low teachers' attendance. Addressing these problems will require targeted reforms, for example improving accountability in the public school system and setting incentives to improve attendance for students and teachers alike.

Economic growth requires further industrialisation and upgrading of services

In the industrial sector, despite productivity improvements in recent years, the depth of technology in manufacturing is still only moderate (Chen et al., 2010). Productivity growth was partly due to very low initial productivity levels and improved access to inputs, but strongly driven by factor accumulation. India's rate of capital formation (as a percentage of GDP) rose only slowly until around 2000, but since then has soared to 36% of GDP and surpassed the rates of most other BRIICS.

Past reforms lifted licensing requirements and capacity limits for firms, but there is evidence that the formal sector in manufacturing is still dominated by large, incumbent firms, particularly in sectors where state-owned firms were traditionally strong (Alfaro and Chari, 2009). There is also a sector of "unorganised" firms, which are smaller on average and are often considered to be India's informal sector. It contributes as much as 50% of GDP and 90% of non-farm employment. Despite this eminent economic importance, there is evidence that manufacturing firms in the informal sector work with less capital, which constrains overall productivity growth (Kathuria et al., 2010 and National Sample Survey Organisation, 2008a, 2008b).

Young firms (less than two years old) are less productive than older firms, but at the same time, younger firms are much more likely to improve productivity as they mature (see Chapter 3, Figures 3.5 and 3.6). Along similar lines, total factor productivity (TFP) is also higher for larger firms than for smaller firms in India. These effects may be partly driven by entry and exit dynamics, by relatively high mark-ups (see Chapter 3, Figure 3.9) but they still suggest growth potential for the economy. According to the World Bank 2012 *Ease of Doing*

Business Index, the number of procedures and cost of starting a business in India are above the BRIICS average (e.g. 12 procedures in India, compared to 10 procedures on average in the BRIICS countries). Entry and graduation of new firms should be supported with technical, legal and administrative advice and improving the overall business environment.

The strictness of employment protection legislation – based on the required procedures for the dismissal of an individual employee for regular contracts – was second highest in India, which probably constitutes an obstacle for many firms (OECD, 2011c). Moreover, labour regulation is managed jointly at the federal and the state level with a high degree of heterogeneity. Generally, income, productivity and technical efficiency levels are quite heterogeneous across Indian regions (see Chapter 5), with some regions (especially large agglomeration areas like Delhi) performing much better than others. These regional disparities may also be related to the differences in regulation at the state level.

The services sector has been an important contributor to growth and has furthered development potential, given that moderately productive services (like retail or personal services) still constitute 50% of total services (Bosworth et al., 2007). This implies that a shift of labour towards non-traditional services such as business, banking and finance or even education and health-related services, would raise the country's overall productivity, but this would also require productivity improvements in many service activities. In addition, growth of more skill-intensive services depends on educational attainment and human capital. Much of past productivity growth may have been driven by low initial levels in combination with liberalisation, and overall productivity levels are still low (Figure 6.5).

In addition, India has in the past benefitted from comparatively low wages in high-skilled service activities, but this advantage is rapidly fading. At the same time, capital levels in services are clearly lower than those in other BRIICS countries (Chapter 4, Figure 4.11B). It is sometimes claimed that developing countries could skip the manufacturing stage of industrialisation and jump directly to a service-based economy. However, with the youth bulge ahead and agriculture accounting for 50% of total employment, it seems unlikely that services alone have the capacity to absorb increasing shares of the labour force. There is significant growth potential for India in fostering labour-intensive manufacturing of the type that has supported growth in many Asian countries, but this will require further reforms addressing constraints for the private sector as well as in other basic areas, such as land rights and agriculture.

Agriculture remains important, especially for employment

In India, the agricultural sector retains an important role, partly because it still accounts for a large share of employment (around 50%) and partly because there is still significant potential for productivity improvements. One key bottleneck is the lack of infrastructure in rural areas, which limits access to markets, affecting output as well as food prices (Credit Suisse, 2013b). The National Rural Employment Guarantee Scheme tries to address this by guaranteeing 100 days of (low-skilled manual) labour employment (at low wages) to members of rural households. Because most works are linked to rural infrastructure projects, the scheme also contributes to improving rural infrastructure, especially transport, which in turn creates new economic activities outside of agriculture.

Insecurity of land titles is another major problem connected with agricultural productivity. Recent estimates suggest that 90% of land titles are not officially secure, which may distort investments in agriculture as well as into non-farm activities. Work on

digitising maps as well as title databases and registries is under way in the context of the National Land Records Modernisation Programme, with finalisation planned for 2017. In addition, land insecurity is also related to other economic activities, because the insecurity of land tenure reduces willingness to migrate or relocate for fear of losing land plots. Making tenure more secure could indirectly also support the shift of labour into more productive activities like manufacturing, which in turn would contribute to growth.

Reforming the energy sector is necessary, but illustrates the country's political economy constraints

Corruption and political economy constraints are some of the biggest obstacles for passing and implementing future reforms in India. India ranked 94 of 177 countries on the Transparency International 2013 Corruption Perceptions Index. This places it between other BRIICS with Brazil, ranked 72 and the Russian Federation, ranked 127. The country's multi-party system helps to give a voice to the heterogeneous population, especially minority groups, but it also slows down reform processes through lengthy negotiations that try to align contesting interests. Multi-level governance with decentralisation and overlapping accountabilities also hamper reforms.

The electricity sector illustrates both the importance of vested interests and the difficulties in implementing reforms. State-level distribution companies buy electricity from providers and sell it to consumers. Agricultural producers and households receive extensive electricity subsidies, which in turn introduces distortions in pricing, and creates rents that make reforms politically difficult.

Reforms in 2003 opened up the market of power generation to private providers but distribution is still largely state-dominated, often in the form of State Electricity Boards. These often have poor financial performance because of price controls and subsidies, which in turn hamper investments in the utilities sector. Consequently, electricity provision is very unreliable which contributes to low labour productivity in manufacturing and services, compared with other BRIICS. Even though some degree of competition has evolved since the reforms, large deficits in power generation remain (OECD, 2011c). Labour productivity is lower in general in utilities than in other BRIICS countries.

These energy subsidies contribute to the high fiscal deficit (IMF, 2012), and are also environmentally damaging. The country's economic output is rising faster than its energy use (see Annex Table 6.A2.3) but the economy still has potential to improve energy intensity in relation to OECD countries in terms of within-industry effects and the industry mix. The country has large natural resources in coal – although it is a net importer – and shifting the focus towards less carbon-intensive energy generation would support more sustainable growth in the long run.

Considerations moving forward

Continued and sustainable structural change can promote growth in India. The current national development strategy, detailed in the Twelfth Five Year Plan (2012-17), sets an ambitious growth rate target of 8% (similar to the previous Five Year Plan). However, within the growth rate target, manufacturing sector growth and agricultural output growth are both considered crucial for faster and more inclusive development. Improving productivity across sectors through reforms to the business environment is envisaged as a key point in achieving these goals.

Better educational achievements will be a key factor in improving productivity and achieving inclusive growth to avoid the middle-income trap. There is great potential for shifting labour into higher productivity activities, and this requires sound skills levels. Access to schooling seems to be less of a problem than the quality of schooling. Student attendance is low in many areas, as is teachers' attendance. Addressing these issues may require structural reforms within the education sector. Accountability within schools, and of schools towards the administration, could help address these quality issues, with a particular focus on teacher attendance. Policies to address this will need to take into consideration major constraints to student attendance such the financial situation and other characteristics of the family, such as caste and religion (Hill and Chalaux, 2011).

The agricultural sector in India still provides employment and livelihoods for large parts of the population, but plots are often very small. Supporting productivity growth in agriculture can support the shift of labour into more productive activities and at the same time improve opportunities for non-farm income in rural areas. The National Rural Employment Guarantee Scheme (NREGA) contributes to rural household incomes and provides a safety net. In addition, the labour is used in public projects, mostly on local infrastructure improvements, which may have positive spillovers.

The government should continue to support agricultural productivity while trying to move labour into more productive sectors. Infrastructure can be an important contribution in this regard. Insecurity of land titles connected to agricultural productivity could be addressed with intensified work on digitising maps, title databases and registries to provide farmers with more secure access to land and the possibility to use it as collateral for borrowing.

Improving productivity across all sectors would support inclusive growth, and this may require a variety of measures in several areas. One factor that is often overlooked is the potential importance of the unorganised (manufacturing) sector. Although data are not regularly collected, this is estimated to be an important share of GDP and employment. Policies which help to create a level playing field could help these firms to develop their growth potential. This could also yield an important contribution to developing a labour-intensive manufacturing base that could absorb shifting labour as well as boost productivity. Firms in the unorganised sector are considerably less productive, possibly because they work with lower capital-to-labour ratios and are constrained in their use of capital. Further liberalising the banking sector to lower capital costs and improve access to finance for the private sector could relieve this constraint.

India can continue to build on its very successful information technology enabled service exports. To do that it will need to improve the quality of higher education as those exports are education intensive. However, continuing strong growth in the service sectors will not be able to absorb the millions of new entrants into the labour force. If India can improve the quality of secondary education, its infrastructure and its investment environment it may be able to absorb more labour into a competitive labour-intensive manufacturing export sector. India would appear to have a good opportunity to do this as labour costs are increasing rapidly in China.

Indonesia

Growth from manufactured exports and more recently a commodity boom have sped up Indonesia's convergence and dramatically reduced poverty. However, competitiveness remains constrained by an unfavourable business environment and low public investment in infrastructure and education, as inequalities increase and environmental degradation often goes unchallenged. Although the middle-income trap is not a near-term threat to Indonesia, its current demographic dividend and income from commodity exports make the present an appropriate time to begin investing in solutions to these concerns. These solutions, however, must also address the country's growing inequalities and serious environmental threats if growth is to be equitable and sustainable.

History and development path

Beginning in the late 1960s under President Suharto's New Order administration, increasingly open economic policies gradually replaced the previous regime's economic nationalism. Runaway inflation and growing government debt were curtailed and the rupiah stabilised while oil export revenues were invested in developing infrastructure and human capital. In addition to these reforms through the late 1960s and 1970s, liberalising reforms and privatisations in the 1980s increased the size of the private sector and helped to attract new foreign investment. Tariffs and other import barriers were reduced in a successful effort to encourage FDI and improve the competitiveness of non-oil exports.

Although the era preceding the Asian financial crisis produced significant economic growth – real GDP grew at 6.8% per year on average between 1980 and 1997 – serious weaknesses remained. Suharto's presidency was marked by increased authoritarianism and corruption that left government institutions underdeveloped. Rule of law was largely abandoned and few written laws were updated from the colonial era, contributing to weak contract enforcement. Despite improvements in the post-Suharto era, government transparency and efficiency remain challenges to Indonesia's development.

In addition to the effects of neglected reforms, the Asian financial crisis and changing international demand have resulted in increased reliance on the export of primary products. The reliance of Indonesian businesses on borrowing in US dollars with insufficient hedging or income in dollars meant that the country was severely affected by the 1997 crisis. The collapse in FDI lasted several years and net inflows as a share of GDP did not recover to pre-crisis levels until 2005, cutting a critical component of investment financing. At the same time, IMF-led liberalisation eventually led to an increase in imported manufactured goods. This period coincided with China's rapid growth, increasing competition in export manufacturing – particularly for labour-intensive activities where Indonesia had specialised.

As a result of these changing conditions, primary goods, in particular coal, gas, rubber, palm oil and ores, have become important drivers of export growth. Between 1997 and 2011, China's share of Indonesian goods exports increased from 4% to 11%, making it the second biggest market after Japan. Goods exports to China are mostly (59%) primary commodities. The share of primary commodities in Indonesia's total goods exports increased from 31% in 1997 to 43% in 2011. This may be cause for concern if Indonesia's economy becomes focused on exports with more volatile prices that limit job creation and reduce opportunities for upgrading.

Challenges

Indonesia will need to improve its competitiveness in manufacturing and services for growth to be more rapid and sustainable. Recent labour productivity growth over 2000-09 was below that of China, the Russian Federation, India and Brazil and more reliant on the movement of workers into higher-productivity sectors rather than within-sector upgrading (comparable data for South Africa were not available) (Figure 6.9). The agricultural sector remains quite large in Indonesia, employing 36% of the workforce in 2011. While commodities are one of Indonesia's comparative advantages given its rich endowment of natural resources, the continued movement of these workers into modern sectors and accompanying capital accumulation will raise future productivity at little cost when compared with the deeper reforms required in countries currently facing the middle income trap.

Improvements in competitiveness are nevertheless needed; productivity levels are near the lowest among the BRIICS. The economy is relatively reliant on low-value-added activities and innovation indicators in Indonesia are particularly weak. Gross expenditure on R&D was 0.1% of GDP in 2009 (the most recent year for which data was available), far below the OECD average of 2.5% and the levels of the rest of the BRIICS. Demographic changes also make it important to improve competitiveness and output per worker. Indonesia has a young population at present, but the population is ageing as birth rates decline and life expectancy improves. The old-age dependency ratio is expected to increase from 8% to 24% between 2010 and 2050. The improvements in economy-wide productivity that are needed to drive equitable and sustainable growth are limited by fundamental issues such as red tape and insufficient infrastructure and education.

Commodity-dependent growth also risks exacerbating already considerable regional income differences if local competitive edges are not developed through improved access to basic services and the exploitation of competitive edges. Unfortunately, problems in implementing decentralisation have further complicated the development of strong and nationally coherent solutions to Indonesia's competitiveness challenge. The government has implemented efforts to increase co-ordination by limiting the extent of decentralisation. In 2004, the decentralisation laws were revised to increase oversight of and constraints on local governments. But improved regional co-ordination will also require increased resources and capacity building in many districts.

Indonesia's business environment limits competition and productivity

Indonesia's business environment remains unconducive to growth, despite government reforms to simplify business procedures and encourage domestic and foreign investment. According to the OECD's Product Market Regulation indicators, Indonesia's regulatory environment in 2008[5] was slightly more restrictive than the rest of the BRIICS and considerably more so than the OECD average. Relative to the BRIICS average, it is more restrictive in terms of state control and less constrained by barriers to entrepreneurship and to trade and investment (OECD, 2011a). The costs associated with starting a new business are high nevertheless; on average, it takes 48 days and 20.5% of annual average per capita income to register a business (World Bank, 2013a). These barriers limit competition and discourage entrepreneurs from entering the market with new products and processes. Inefficient and opaque systems of administration also contribute to Indonesia's problems with corruption among public officials by creating opportunities for bribery.

Labour market flexibility is also negatively affected by rapidly increasing minimum wages and strict employee protection. Such regulations encourage the hiring of informal labour. While the share of informal workers among the total employed appears to be declining, an estimated 53.6% of workers in 2012 were still informal workers. While employee protections are important, they must balance the interests of workers with the need to remain competitive and encourage job creation.

A lack of openness to foreign investment is a particularly important barrier to industrial development and technological transfer. Among the BRIICS, only China and Russia have more restrictive policies, as measured by the OECD's 2012 FDI Regulatory Restrictiveness Index (Figure 3.8). Investors are limited in their employment of expatriates and are usually required to invest along with domestic partners or to divest to Indonesian shareholders after an initial period. Additional restrictions are in place for the extractive and financial sectors. The ban on mineral exports that came into effect in January 2014 was intended to force the establishment of domestic processing facilities, but, despite adjustments to allow for trade in some semi-processed minerals, is likely too broad to encourage further investment in future.

Infrastructure and education are not sufficient to meet growing demand

Infrastructure constraints limit growth and investment in infrastructure in Indonesia has been significantly lower since the Asian financial crisis (from a high of around 7% of GDP to around 3% to 4% recently). Insufficient infrastructure also affects equity and prevents many from sharing in growth (for example, 43% of Indonesians lack basic sanitation). Until recently, the absence of laws on government compulsory acquisition of property has constrained infrastructure development in Indonesia. In 2011, the House of Representatives passed the Land Acquisition Law to rectify this situation and accelerate future infrastructure planning and development. Interregional co-ordination in infrastructure planning will also be needed to develop efficient systems and eliminate bottlenecks.

ICT infrastructure is underdeveloped in Indonesia and insufficient access to new communications technologies impedes growth. Internet use, for example, grew slower than in most of the BRIICS except South Africa over 2000 to 2012 and the share of the population with internet access (15% in 2012) is only above that of India (13%). Although there has been considerable change in the telecommunications sector since serious liberalisation reforms began in 1999, the market remains dominated by a few companies. Improving connectivity is likely to be a particularly important component of Indonesia's development, as this will allow for better delivery of health, education and other services for a population spread over 922 islands. Improved infrastructure will also be important in creating better information flows and market connections, including for the development of more competitive modern services, an increasingly important sector in Indonesia.

Improved access to quality education will also be needed to provide the skills required by modern industry and services. In 2008, the most recent year for which data are available, only 7% of the Indonesian workforce had tertiary-level education, and only 22% more had secondary education. The quality and relevance of this education is also poor. Indonesia's PISA scores are near the bottom of participating countries, though it is also among the poorest of these countries. Expanded access to education is needed to improve equity and social mobility and to maximise human capital resources. Children from low-income families tend to have lower levels of educational attainment and there are significant regional disparities in the provision of education, especially between rural and urban areas.

Declining poverty and increasing inequalities

As in other emerging economies, economic growth, urbanisation and improvements in agricultural output per worker have driven impressive reductions in extreme poverty. Although poverty increased briefly during the crisis, between 1990 and 2010, the share of the population living on USD 1.25 or less per day fell from 54% to 18%. Over this same period, the population share living on USD 2 or less per day fell from 85% to 43% (Annex Table 6.A2.2).

However, inequalities have been increasing rapidly. While the country's Gini coefficient remained mostly unchanged through the 1980s and 1990s, it increased from 29 in 1999 to 38 in 2011. This degree of income inequality remains relatively low in global terms, particularly for Indonesia's average income level, but a continuation of this trend would be cause for concern. Given the country's young population and high levels of youth unemployment, continued growth and social stability relies on the creation of jobs for these workers.

In addition to income inequalities between households, there are considerable regional inequalities in income, wealth and access to services. The rural-urban divide is particularly wide, with rural residents generally being poorer with less access to basic services and infrastructure. A decentralisation process started in 2001 to pass responsibility for basic services to district governments. However, the limited resources and capacity of some local governments have exacerbated these regional differences in some cases and, although funding to the districts has increased, most of it is used for operational expenditures.

As elsewhere in Southeast Asia, rapid urbanisation has created significant social and environmental challenges, in addition to creating centres of concentrated economic activity. Between 1980 and 2011, Indonesia's urban population increased 3.7 times. While this trend is slowing, the urban population is expected to increase by a further 72% between 2011 and 2015. Insufficient investment in infrastructure has resulted in heavy traffic congestion, particularly in Jakarta, with increased pollution and reduced productivity.

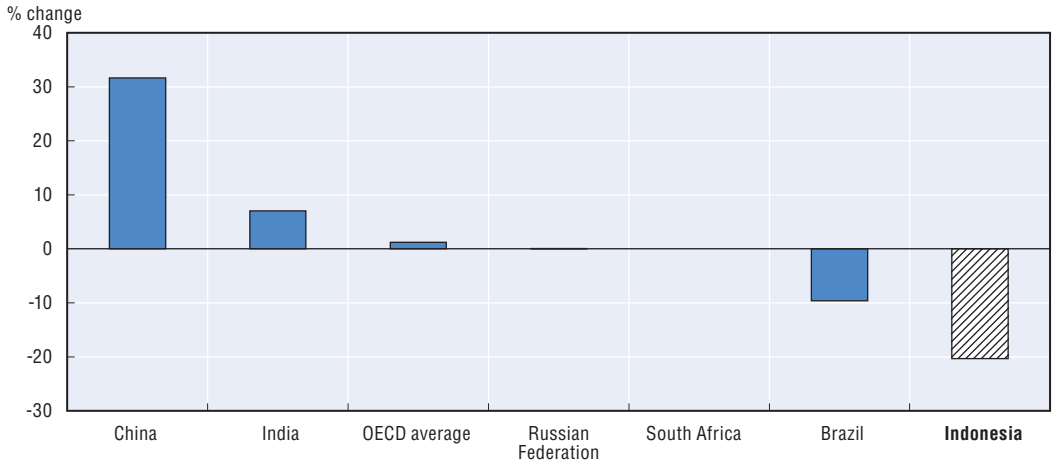
Neglecting environmental issues in growth

Generally insufficient enforcement of environmental protection and a reliance on primary industries have created serious challenges for sustainable development in Indonesia. This is particularly evident in the country's forestry management. Deforestation from logging, much of it illegal, and the expansion of agriculture, including slash-and-burn farming for plantation and subsistence agriculture, are destroying the country's rich biodiversity and depleting its valuable timber resources. While Indonesia still has a large forest area – covering 52% of the country's land area in 2010 – this has been shrinking rapidly (Figure 6.12). Between 1990 and 2010, the forested area declined by 20%.

Despite legal protections of forests designed to ensure their sustainable use, an estimated 73% to 88% of timber was illegally logged in 2003 and thousands of acres are lost to forest fires started naturally or intentionally. Several major out-of-control forest fires (including in July 2013), thought to have been initially set illegally to clear land for agriculture, produced clouds of smoke that covered significant parts of Indonesia and neighbouring countries. High-level corruption, bribery of local officials and weak enforcement capacity all contribute to these losses.

Figure 6.12. **Forest coverage has declined considerably in Indonesia**

Percentage change in forest area coverage, 1990-2010



Source: World Bank (2013a), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933059110

Energy efficiency will become a more important issue to Indonesia as incomes rise and industry expands. A positive sign seen recently is the large cut to fuel subsidies announced in June 2013. These subsidies, which were valued at 2.5% of GDP, had strained government resources and disproportionately benefited wealthier Indonesians with cars and other energy-consuming goods (Mourougane, 2010). Along with higher fuel prices, the government committed to a package of compensations, including a temporary cash transfer, for low-income households affected by the reform. Energy efficiency in Indonesia is better than in most of the other BRIICS (except for Brazil and India), but is worsening faster in manufacturing than in the other five countries. Greater protections on energy use and pollution will be needed as manufacturing continues to expand.

In addition to reducing the environmental impact of economic activity, Indonesia will need to increase future investments in climate change adaptation. The country is particularly prone to flooding. Rising sea levels and increased rainfall will increase threats to low-lying areas and drainage basins, including heavily populated areas such as Jakarta. The construction of flood management and early warning systems will help to reduce the human and economic costs associated with these disasters (OECD, 2013d).

Considerations moving forward

Indonesia does not face the same threats of slowing growth as many other middle-income countries, since increased factor accumulation and structural transformation should continue to drive convergence in the near future. Improvements in competitiveness through an improved business climate, increased infrastructure development and improved access to relevant education programmes could help to drive inclusive and environmentally sustainable growth.

Red tape raises the costs of doing business in Indonesia. The Indonesia Investment Coordinating Board (BKPM) has taken a number of useful first steps in this regard by cutting red tape and improving services for investment licensing, including by establishing (with provincial and local partners) One Stop Services (OSS) centres around the country that

provide all necessary investment licensing services. Informal employment could be reduced through a combination of increased enforcement and regulatory reform that considers the benefits and cost of present protections. Simplification and regional harmonisation of basic business procedures could further help improve transparency.

Despite improvements in recent years, corruption among public officials at all levels remains a barrier to equitable and sustainable growth. The civil service bill passed by the House of Representatives in December 2013 and the government's *Grand Design of Bureaucratic Reform 2010-25* provide a framework for improving accountability. More targeted reforms may also be necessary in sectors at greater risk of corruption. In a promising development, Indonesia has been taking steps since 2009 to implement the Extractive Industries Transparency Initiative (EITI) and improve its governance of the natural resources sector generally.

Improved infrastructure will play an important role in supporting Indonesia's competitiveness and growth. The new land acquisition law, if combined with increased investment, should allow for faster infrastructure development to keep pace with economic growth and reduce bottlenecks. The government has already shown interest in fostering public-private partnerships PPPs for this purpose; in 2010, PT Indonesia Infrastructure Finance, a private enterprise funded by the government, ADB, IFC and German Investment Corporation (DEG), was launched to attract and pool private financing for Indonesian infrastructure. Its efforts should be made easier by recent reforms to the law on public-private partnerships that clarified the tender process and the Indonesia Investment Guarantee Fund (IIGF), which was started in 2010 and helps to reduce the risks investors take on in working with the government.

Education, similarly, will need to better match the needs to firms and be widely available to make use of potential human resources. Increased spending on schools will help provide students with the skills needed to work in modern industries and to incorporate technology in their work. Future investments could focus on improving overall quality and access in rural areas and lagging regions and on developing appropriate national and interregional planning strategies. Access for poor and rural students may be improved through an expansion of the School Operations Fund (BOS), which provides transfers to schools serving poor and remote areas, or through education grants and conditional cash transfers to poor families. Vocational education, which can help to address skill mismatches, is becoming increasingly common and the government is targeting further growth in the future. In the context of decentralisation, increased bottom-up co-ordination will likely be another dimension affecting how education systems are designed.

If properly designed and implemented, decentralisation can be used to drive regional growth in Indonesia. Flexibility in policymaking can help districts and provinces to take advantage of local competitive edges. To do this, however, Indonesia will need to secure financing for the provision of basic levels of service and develop local competencies, especially in smaller and lagging regions.

Greater environmental protection would to protect biodiversity and manage Indonesia's natural resource wealth for future generations and continued growth. This may require legislative and regulatory change, though increased resources will be needed to enforce these protections. The reduction of fuel subsidies is an important reform in this respect. Indonesia will also need to invest in managing the risks associated with high exposure to the effects of climate change.

China

China is among those middle-income countries in which per capita incomes are most likely to converge with those in advanced countries in the next couple of decades. Its status as an upper-middle-income economy and unprecedented growth in the past decades underpin this expectation, notwithstanding the accelerating pressure stemming from demographics and the urge to increase efficiency in many areas of the economy.

China still reports robust economic growth, relatively strong productivity growth and has a government determined to drive the economy through a new series of reforms to reach high-income status. In tandem with ensuring continued rapid convergence by those reforms, there should be renewed attention to rising inequalities, environmental degradation should be halted and the damage caused by "growth above all" policies in the past needs to be repaired.

History and development path

Producing an average real growth rate of over 10% during the past decades, China has outperformed not only Japan during its high-growth period following post-WWII recovery but also the four "little dragons" – South Korea; Hong Kong, China; Singapore and Chinese Taipei – during their "take-offs" in the 1970-80s. These high-growth spells across Asia occurred during rapid industrialisation of those economies and coincided with the demographic dividend, which has benefited the catching up of these economies. China's spectacular growth, particularly from the 1980s has been driven by investment and productivity, while the contribution of labour inputs has been fading since the 1990s (see Figure 6.4).

Domestic reforms to introduce incentives for efficiency gains starting in the state-owned and collective sectors and increasing recognition of the role of private business in enhancing efficiency have been important steps that ignited growth in the 1980s. Rapid integration through exports and FDI in the global economy and the knowledge generated through these channels has been crucial to embark on this path. Exports and FDI implied expansion of production on the supply side and diversification into an increasing range of products. Government investment has become a crucial driver of growth. All this happened as fertility rates were falling sharply – largely due to the widespread implementation of the one-child policy – population growth slowed and the size of the working-age population increased. The country thus enjoyed the demographic dividend that accelerated growth. The migration of labour from rural to urban areas acted as a driver of productivity growth.

The roles of government and market have changed significantly over China's catching-up period. Starting from a pan-government planned economy at the outset of reforms under Deng Xiaoping in 1978, China has achieved a big-government market economy in roughly two decades, when another "big push" stemmed from its accession to the WTO in 2001 and the related opening and integration into the global economy. It had produced remarkable results until recently, when a third round of measures was announced to strengthen the economy's convergence path. This will be a crucial transition to a "limited government" and greater adherence to market economy principles in order to lead the country to the group of high-income economies in the coming decade or so.

These changes have been largely inclusive. Poverty has been significantly reduced throughout the country owing largely to industrialisation and urbanisation that benefits masses of people. The rural share of the population dropped from 80% in 1980 to below 50% in the 2010s. Job creation in industrial centres and adoption of an urban lifestyle led to overall satisfaction with reforms, in particular in the early phases.

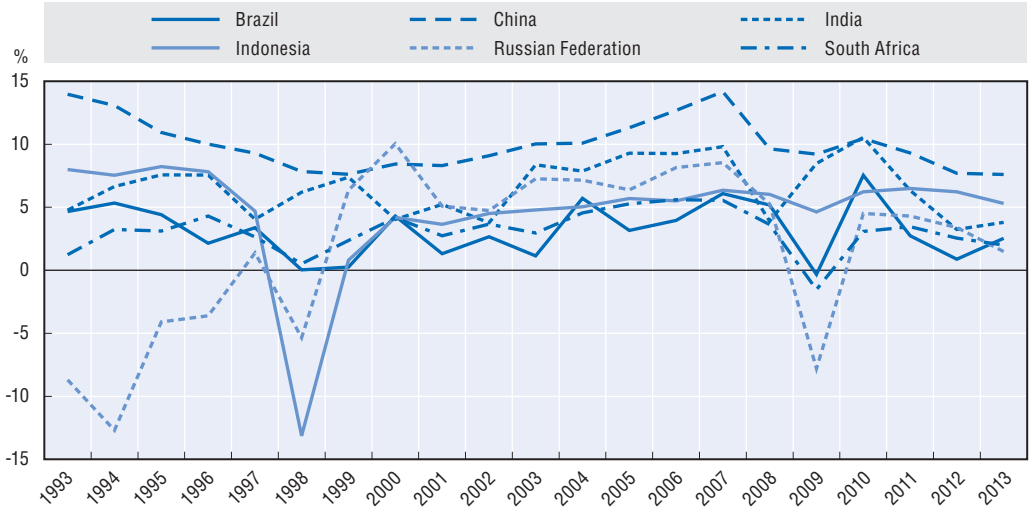
Challenges

Declining growth rates

This remarkable economic performance, however, should not lead to excessive confidence that the rapid convergence will continue by maintaining the status quo. China has outperformed the other BRIICS but growth is slowing (Figure 6.13). From double digits in the past decade, China's growth is projected to decrease by a couple of percentage points, although remaining impressive by international standards in the medium term. At present China is at the lower-end of the upper-middle-income bracket, where it often becomes tougher to sustain rapid growth. Trend growth is expected to decelerate mainly due to rapid population ageing, but present structural deficiencies could also contribute to this deceleration if not addressed swiftly.

Figure 6.13. **China has outperformed the other BRIICS**

Real GDP growth rates of the BRIICS 1993-2013



Source: IMF (2013), *World Economic Outlook, 2013*, International Monetary Fund, Washington, DC.

StatLink http://dx.doi.org/10.1787/888933059129

Ageing population and slowing labour force growth

Labour accumulation-led growth has little room to continue in one of the most rapidly ageing populations in the world, and the working-age population is declining. The median age of the Chinese population will have almost doubled over the course of a century to 46 years in 2050, while the dependency ratio will be the same as 100 years before at 63%. In 1950, child dependency was high and old-age dependency low; however, old-age dependency will overtake child dependency by around 2030.

Migration to large cities, where living costs are rising and less can be saved from wages, has nearly stalled, reducing expectations that cheap labour can keep the economy afloat. As an alternative, the government is now encouraging migration to smaller cities, where living costs are lower. Jobs, however, do not always follow ambitious urbanisation projects and the resulting "ghost towns" are proof that urbanisation cannot go ahead of industrialisation and job creation.

Falling investment efficiency

China's capital stock has accumulated rapidly over the past decades and this boosted the economy's growth potential. Investment is still expected to be an important driver of growth for the foreseeable future as the capital stock in per capita terms still lags behind that of advanced economies; this, despite the mushrooming of highways, airports and other infrastructure across the country. Notwithstanding the need to build up the capital stock, investment efficiency has been declining (see Figure 1.8 in Chapter 1). This trend not only reflects a decline that is expected once capital accumulates, but may also be related to a misallocation of funds for investment. This, in turn, stems from a relatively low level of efficiency in the financial sector.

Although productivity has been an important driver of past performance, the level of productivity in the manufacturing sector is still far behind that not only of the United States but also other OECD countries (Figure 6.5). Moreover, there have been some indications that productivity growth has also decelerated (OECD, 2013d). A further round of market-friendly reforms is expected to reverse this process and help achieve productivity gains and thereby boost long-term growth. In addition, China has not only become very efficient at tapping global knowledge, but is also investing heavily in technical capital and R&D to be better able to innovate and to develop its own technologies (see Chapter 2). In 2006, China initiated a 15-year "Medium-to-Long-Term Plan for the Development of Science and Technology", which called for China to become an innovation-oriented economy by 2020 and a world lead in science and technology by 2050 (Cao et al., 2006).

Regional disparities are manifest in productivity, with the manufacturing clusters boasting the highest levels of output per worker (see Box 5.2 in Chapter 5), but a clear pattern of convergence in productivity growth across provinces can be observed over the past decade (see Figure 5.2 in Chapter 5). Technical efficiency of Chinese firms differs much less across provinces than in India or Indonesia (see Figure 5.3 in Chapter 5).

Inequality concerns are on the rise

Although industrialisation and urbanisation lifted millions out of poverty, the "big-bang" style of reform has left behind many who feel they have not been compensated for the costs of these reforms. The rural population has enjoyed income gains related to increasing productivity in agriculture and job opportunities in industrialising cities. The 50 million *xiagang* workers that were laid off as a result of the state-owned enterprise reform in the early 2000s still constitute a large part of the working-age population in some areas with fewer opportunities to reap the benefits of robust growth.

Migrants have not been fully integrated into the urban population and are still have less access to public goods and services. This hinders social mobility and constrains a potentially large source of consumption. Moreover, income inequalities have strengthened the perception of a failing system and highlighted the need for a more inclusive pattern of growth. Lack of access to public goods and services by migrants has created another series of social problems with children left behind in the countryside by their parents to be looked after by grandparents. Even for those children who, as a result of more liberal and generous policies, were able to enrol in primary school in cities, they need to move back to their place of origin for their high-school years since entrance exams to university (the *gaokao*) are administered at the province level.

"Growth above all" has neglected the environment

Growth has been the key objective of development and industrialisation has been pursued above all objectives. State ownership of a significant part of the industrial sector coupled with subsidies in the form of easier and cheaper access to finance and low-cost energy have created inefficiencies and pollution levels that require immediate action.

Energy intensity of production is well above the OECD average in manufacturing and in some industries such as textiles, non-ferrous metals, non-metallic minerals and machinery it is over double. Cheap energy gave way to the development of energy-intensive export industries where China otherwise would not have a comparative advantage since it is a net importer of energy.

Coal has been a key source of energy and has created pollution reaching hazardous levels not only in industrial but also in residential areas. Increasing industrial tariffs for energy has curbed somewhat incentives to waste, but China's high energy intensity is still related more to its excessive use in the industrial sector than to the structure of industry. Recent moves to switch the system of urban heating from coal to gas aim to reduce urban pollution in the heating season, but Beijing is the only large city that has implemented it so far.

Considerations moving forward

Mounting pressures in all three key objectives of maintaining robust growth, making it more inclusive and making it environmentally sustainable call for a new round of fundamental reforms. China's new government is taking steps toward avoiding excessive deceleration by considering an overhaul of the macroeconomic management system and by eliminating structural barriers to growth. The reform programme of President Xi is important and gives emphasis on strengthening market mechanisms, revisiting the role of the government in the economy and on restructuring industry through the breaking up of monopolies and stepped-up state-owned enterprise reform. As the low-hanging fruits such as the productivity gains from the rural-urban shift of labour, the demographic dividend and integration into the global economy have mostly been reaped, at this stage only a comprehensive reform package is likely to yield significant benefits. The planned overhaul of the macroeconomic system covers all major areas, including the exchange rate and interest rate frameworks and the capital account and also envisages better co-ordination across policy making and regulatory agencies through a newly established co-ordination mechanism.

Over the medium term, exchange rate flexibility is expected to increase in both directions and the rate to be increasingly determined by market forces rather than by intervention by the central bank, as used to be the practice. The reform process, however, is envisaged to be gradual, hinging upon the stage of development of the financial system in order to reduce disorderly and volatile movements in financial prices and exchange rates. Moving towards market-based interest rates will facilitate adjustments to changing economic conditions in the near-term as well as improve the transmission mechanism of monetary policy. More broadly, the reforms are expected to enhance financial intermediation and to result in a more efficient allocation of funds in the economy. A prerequisite for the success of the reforms, however, is the ability of financial institutions to assess risk and to set interest rates accordingly, the improvement of which is an immediate goal. With a better allocation of funds, investment efficiency, which shows a decelerating trend, could improve, helping to sustain capital accumulation in areas where most needed. The overall capital stock is still low in per capita terms (Koen et al., 2013), notwithstanding decades of high investment rates. Efficiency gains are expected also from gradual liberalisation of the capital accounts, which at present are comparatively restricted (Molnar et al., 2013). According to the reform plans, not only qualified domestic institutional investors but also qualified domestic individual investors will be allowed to tap international capital markets for higher returns. Deposit interest rates, which at present yield very modest returns to savers, will also ultimately be liberalised.

In addition to the fundamental changes in the macroeconomic management framework, a range of structural reforms are also envisaged to mitigate growth deceleration over the medium term. Greater emphasis will be given to the development of the service sector, which has been lagging behind manufacturing and is highly regulated. The financial system will be in the centre of reforms and is expected to contribute to efficiency gains across the whole economy. With interest rate liberalisation, the relatively large margins between bank lending and deposit rates sustained by regulation are expected to gradually erode, allowing increased competition to emerge. The pace of liberalisation, however, is expected to be managed to avoid risks to financial stability. In addition to financial system reforms, other priority areas include the distribution system, transport and business services.

There is widespread support for these reforms since it is widely recognised that maintaining the status quo will not be sufficient to ensure continued convergence. As with new policies in the past, opening and liberalisation will be undertaken on a trial basis in a limited jurisdiction in the Shanghai Free Trade Zone. This newly established special zone will be a laboratory of market liberalisation on a much larger scale than before. Capital account liberalisation, which has been considered for over a decade, is also part of the package and is being implemented gradually. Reducing regulation in service industries – in particular financial services – will be important for efficiency gains. It could also speed up manufacturing development that is constrained by the under-development of service industries. Competitive pressure in the financial sector could enhance efficiency and improve financial intermediation. This in turn, could lead to a better allocation of funds in the economy.

The new reform overhaul may also lead to more inclusive growth by removing discriminative regulations against migrant workers. The reform of the *hukou* (household registration) system is a key component of this overhaul since it would create equal rights to public services regardless of urban or rural origin and would enhance labour mobility. China has still some hundreds of millions of rural citizens to move to urban jobs, but this process was slowed by the sharp decrease in return to migrating to cities in the recent decade or so as living costs are increasing.

Significant progress is also expected in the area of sustainability. Since the arrival of a new government in 2013, there is greater awareness of past pollution and the need to move to more environment-friendly and thus sustainable growth. The Central Urbanisation Work Conference in late 2013 highlighted the need to improve urban construction, establish diverse financing channels, and ensure greater land-use efficiency as three of the six major economic tasks for the next phase of China's urbanisation. Environmental protection and sustainable development were also seen as high priorities amid urbanisation; this suggests stricter requirements and enforcement of capacity phase-outs in several industries, including some heavily polluting ones such as cement. In the coming years even more is expected, but preventive policies to avoid further pollution seem to be prioritised over cleaning up past pollution. Publicity of environmental damage has greatly increased and measures of air pollution are being advertised to raise public awareness. In addition, polluters are subject to hefty charges that allow for clean-up and enforcement appears to be working. Pollution will be tackled on multiple fronts with high energy consuming and heavily polluting firms as the primary targets. Pollution by vehicles will be addressed both from the side of maintaining an environment-friendly fleet and discouraging excessive consumption of fuel. Water quality was decided to be monitored in 2012 using 106 indicators, including heavy metals, but facilities to treat and monitor water quality will not be operational in all provinces until 2015. A relatively recent policy requires provinces to develop plans to strengthen environmental sustainability and reduce degradation. This is done by categorising land according to its use and imposing varying restrictions on land development according to those categories.

The new wave of reforms envisaged by the new government in China and confirmed by the guidance book following the Chinese Communist Party's Third Plenary Session in November 2013, if implemented in an orderly and timely fashion, is likely to boost growth in the medium term. This would reduce the risk of a sharp slowdown in China's growth and its potential adverse impact on the global economy. There is, however, uncertainty with regards to the timing and the extent of implementation of the reform package as well as the magnitude of the impact.

South Africa

South Africa has achieved only moderate growth in recent years, and is suffering from high unemployment, poverty and inequality. Natural resources have been an important driver of growth owing to some extent to the "shifting wealth" process, while manufacturing has declined in recent years. South Africa's catch up in terms of labour productivity with the OECD over the past decade is moderate and its labour utilisation gap even widened over that period. The country's labour utilisation gap is the largest among the BRIICS, but its labour productivity gap is on a par with that of China or Brazil, smaller than that of India and Indonesia, though larger than that of the Russian Federation. Although South Africa's demographics are favourable for growth over the coming decades, to ensure that the country moves back on a fast convergence path with advanced country per capita incomes, productivity-enhancing reforms are needed. These include a higher educational attainment and policy reforms to boost private sector competitiveness.

History and development path

Severe obstacles continue to hamper economic growth in South Africa. The country has experienced overall moderate growth since the end of apartheid in 1994 (Annex Table 6.A2.1). Despite good preconditions, such as a young workforce and wealth in natural resources, the country has been unable to fully exploit its potential. During the apartheid regime, the country moved out of agriculture and established a base in manufacturing, which accounted for more than 20% of GDP in 1994. However, this share has declined to 12% in 2012, while resource rents have increased since the year 2000.

The origins of many problems go back to the country's apartheid history and its economic isolation during that period (OECD 2013e), but policies since then have not yet addressed some major obstacles. More than 80 years of segregation have strongly shaped the country's economy: inequality is high by international standards and has increased during the last two decades and many areas of the economy are dual in nature, especially labour markets. For example, around 20% of jobs are estimated to be in informal, unregulated activities not covered by social security or taxation (OECD, 2013e). The apartheid regime's economic policies also favoured large enterprises and close networks between dominant firms, which may still be reflected in the large degree of concentration in certain markets.

Post-apartheid national policies framed in the Reconstruction and Development Programme focused on improving social policies, mitigating poverty, and developing human capital. The emphasis on economic growth and macroeconomic policies was strengthened with the Growth, Employment and Redistribution (GEAR) strategy, which assigned the government a clear responsibility for creating an enabling economic environment. This involved a much more outward-oriented growth strategy that included trade liberalisation and regional integration. However, despite broadly supportive macroeconomic policies, the economy failed to pick up as expected and structural change tends towards deindustrialisation. The manufacturing sector declined and natural resources became one of the main drivers of economic growth. The recent National

Development Plan (2011) takes stock of the progress made since 1994 and considers the way forward to 2030, prioritising education, skills and employment to foster more sustainable growth.

Challenges

The country shows lagging growth despite having favourable preconditions. In 2012, South Africa had a GDP per capita (PPP) of almost USD 10 000 and the GDP growth rate during the last decade was around 3.5%. These numbers clearly put the country at an upper-middle-income level. However, to achieve income convergence with OECD countries in the next 50 years, South Africa would have to increase this growth rate. The country could benefit from a number of advantages, such as a demographic dividend and wealth in natural resources, but achieving such a growth rate will be a challenge, given the many economic problems and obstacles to growth.

In recent years, the country could not fully exploit its natural resource wealth. Mining contributes almost 10% to GDP, but strikes in the mineral sector and infrastructure bottlenecks (mostly electricity and transport) hampered production and exports. Even under the best of circumstances, the mining sector is capital-intensive and therefore unsuitable to absorb the growing labour force. Manufacturing, in turn, declined to 12% of GDP in 2012, while the share of services amounted to almost 70%, well above many other non-OECD countries. In addition, productivity levels are comparatively low, while wages (in the formal sector) are high.

With growth below the country's potential, poverty levels are still high (Annex Table 6.A2.2), although redistribution policies have mitigated poverty. Income inequality is also high, partly because large parts of the population are unemployed or work in the informal sector where wages are much lower (IMF, 2013b).

South Africa also draws heavily on its environmental resources. Power generation is largely based on coal, which drives up greenhouse gas emissions (Annex Table 6.A2.3). At the same time, energy subsidies have discouraged any moves towards greater energy efficiency and introduced additional distortions in the allocation of resources to economic activities. Policy reforms in a number of dimensions are necessary to support South Africa's advancing out of the middle-income category through higher productivity.

The country is endowed with several favourable factors including a wealth in natural resources and a young population. The services sector is large, and some sub-sectors are advanced even by middle-income country standards (such as banking and finance). Indicators suggest that the business environment is moderately supportive and prospects for regional integration are positive. Nevertheless, there are still many challenges, including an excessively high unemployment rate of 25%, due to a small manufacturing sector, infrastructure bottlenecks, and low educational attainment.

Improving investments in education to address unemployment

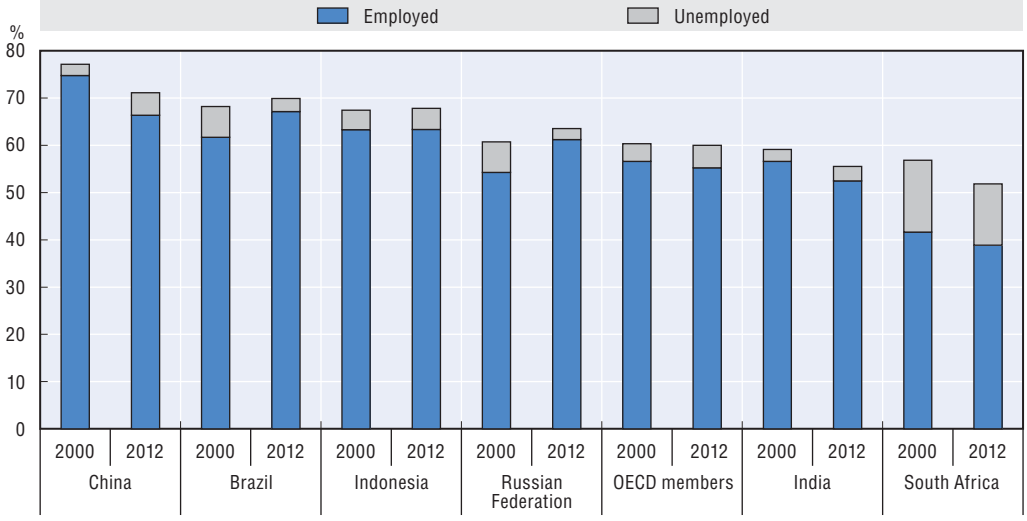
South Africa has a young population, with a high dependency rate, mostly driven by children (i.e. the youth bulge is yet to come). On the one hand, this may be an advantage if the increasing labour force can be productively employed; on the other hand, it also constitutes a threat since unemployment among young people is already excessively high.

Youth unemployment (for the population aged 15-24) amounted to more than 64% (AfDB, OECD, UNDP, ECA, 2013). The overall labour force participation rate is low at 52% in 2012 (Figure 6.14), although it has increased since the end of apartheid.

South Africa achieves relatively high enrolment levels in international comparisons, but completion rates are much lower for the population older than 15 years because many pupils drop out of school at some point. Average completion rates also differ across the population, which in turn translates into heterogeneous employment outcomes (Barnard, 2009). High drop-out rates (for example because of household financial constraints) contribute to unemployment because workers do not have the skills demanded by firms (Department of Trade and Industry, 2014).

Figure 6.14. **Labour force participation rates are low in South Africa and a quarter of the labour force is unemployed**

Labour force participation rates decomposed into employed and unemployed, 2000 and 2012



Note: All data from 2012 except for unemployment data for Brazil (2011) and Indonesia (2011) and China (2007).
Source: Author's calculations based on World Bank (2013a), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

StatLink http://dx.doi.org/10.1787/888933059148

Although the government has increased investments in education in recent years, the level of per student spending is still lower than in OECD countries and deficits in school infrastructure remain. For example, textbooks are sometimes not available or not delivered, and in some provinces only 10% of schools offer access to computers for their students. In addition, it seems difficult for rural schools to attract qualified teachers, which in turn forces them to hire unqualified or under-qualified staff, although there is also some unemployment among graduates of teacher colleges (Department of Basic Education, 2011). Poor capacity management and planning within schools and at various administrative levels seems to exacerbate the problem.

Reforming institutions to foster productivity and growth across sectors

The economy's sectoral structure contributes to the unemployment problem. The manufacturing sector has declined and accounted for only 12% of GDP in 2012. Low-skilled manufacturing activities would have the capacity to absorb the growing labour force and offer potential for future productivity growth, but in the past, a number of obstacles prevented the industrial sector from growing.

Labour institutions have contributed to wages which are generally very high and rising faster than productivity in the formal sector (Klein, 2012). Productivity is also hampered by low levels of competition in many industries, and the SME sector is small because of obstacles to entrepreneurship (IMF, 2013b).

The country's labour utilisation gap with the OECD has widened during the last decade (see Chapter 2, Figure 2.1) and unemployment rates are high, but nevertheless, access to qualified workers is difficult for firms. South African firms cite an inadequately educated workforce and labour regulation more often as the biggest obstacles to business, compared with firms in other African countries (World Bank, 2013b). Apart from the low quality and completion rates in general schooling, vocational and on-the-job training could also help to address the present skills mismatches that are reflected in the data.

This may be related to the historically strict spatial segregation and also to poor transport infrastructure, that makes it difficult for workers to move or commute to the places where there are jobs. Historically, the apartheid regime established tribal homelands with limited economic opportunities and put heavy restrictions on relocation and movement of the Black population. Poor infrastructure makes commuting and relocation in the country difficult and persistence of behavioural patterns may also contribute to limited labour mobility today.

Certain labour market institutions present another obstacle to economic growth. Labour unions in South Africa have a strong standing. In addition to plant-level agreements on collective wages and labour standards, large firms and labour unions negotiate wages for specific regions and sectors, which are then also applied to non-unionised firms. While large firms can often afford to pay high wages, small firms are driven out of the market (Magruder, 2011, OECD 2013e). This essentially creates protected markets for some firms. The close relationship between the few dominating labour unions and the ruling party adds further political economy obstacles to regulation and especially labour and employment regulation. Improving labour utilisation and reducing unemployment through labour institution reforms would be important measures to foster economic growth.

Product market regulation in 2013 was higher than the OECD average, but lower than the BRIICS average (OECD, 2013c). Many firms (especially in network industries) are state-owned and the apartheid regime promoted market-dominating firms and tight networks of co-operation to maintain their hold on the country and the economy, while, at the same time, preventing entrepreneurship in the Black population. The South African Competition Commission has prosecuted numerous cartel cases, especially in priority sectors of food and agro-processing, intermediate industrial products and construction and infrastructure (Competition Commission of South Africa, 2008) but the economy still displays high levels of concentration (IMF, 2013b).

Labour market institutions, market concentration and low education levels also present obstacles for the service sector. South Africa has a strong standing within the region, especially in finance- and business-related services, but labour productivity in many services is nonetheless lower than in manufacturing, even in a dynamic sector such as business and real estate services, and despite recent improvements in labour productivity.

Removing infrastructure bottlenecks

South Africa is rich in natural resources, including coal, but the economy suffers from severe electricity bottlenecks. In 2008, during especially severe power shortages, mining companies were forced to shut down, and in 2013 targeted load-shedding (also affecting mining smelters) was used to stabilise power supply across the country. The government has taken measures to address this under the 2011 "Integrated Resource Plan" and constraints are expected to be mitigated as new power plants start production in 2014.

The government is making efforts to invest in infrastructure but investments are constrained by a tight budget situation and low household savings. In the face of high unemployment, low wages in the informal sector, and the increasing availability of consumer credit, household savings rates have turned negative in recent years, implying that households spend more than their disposable income (National Treasury, 2012).

South Africa's economy has a high level of energy intensity and greenhouse gas emissions, both driven by its resource wealth (the minerals sector and coal-heavy power generation) and subsidy policies. Between 2000 and 2010, output rose faster in South Africa than energy use, but the share of renewable energy sources is much smaller than, for example, in Brazil or India (less than 10%, compared with 40% and 20% in 2010, respectively, see Chapter 3). Emissions as well as the general problems in power supply are probably related to South Africa's policy of implicitly subsidising energy provision (OECD, 2013f). In recent years, progressive price increases have brought electricity prices up from very low levels, reducing implicit energy subsidies to levels below those of other emerging economies. Despite this progress, the state power provider still receives coal at prices below market levels and is subject to managed price setting by the National Energy Regulator of South Africa, which not only contributes to the poor financial performance of power providers, but also reduces incentives for households and firms to economise on electricity or invest in energy efficiency. The government has also set a policy agenda with ambitious targets for strengthening green growth and increasing the share of renewables in electricity generation under the Integrated Resource Plan 2010-30. The government should continue its commitment to this agenda and reinforce implementation of the envisaged reforms and measures.

Social cohesion may become fragile if growth cannot be reignited

Potentially, the biggest threat to sustainable growth is the combination of inequality, joblessness and poverty, especially given the coming youth bulge. The apartheid policy of establishing tribal homelands with very limited economic opportunities and infrastructure adds a spatial dimension to inequality, and inequality is also present in the distribution of educational outcomes (for example, educational outcomes for white students are much better than for black students), which in turn translates into heterogeneous employment rates. There are also regional disparities within the country, partly because poor infrastructure hampers regional connectivity as well as labour mobility.

Redistributive policies have done a lot to mitigate poverty and improve living standards, but they cannot make up for lacking growth and employment. If South Africa were able to ignite economic growth and achieve employment growth, this could yield multiple social dividends: it would provide higher incomes and lower poverty rates, relieve the government budget of social expenditures, and help to lower crime rates, which is also an obstacle to growth and entrepreneurship.

Considerations moving forward

Policies to reignite growth and improve productivity will be vital for South Africa moving forward. Education, skills and employment are key for ensuring convergence with the advanced countries, as the 2011 National Development Plan acknowledges.

Enrolment rates in South Africa are quite high but educational outcomes are poor. Inadequate school infrastructure, poor quality teaching, and low attendance rates all limit educational attainment. The government could consider targeted infrastructure investments to address shortages of textbooks and increase access to computers, as well as measures to address school drop-outs across all levels of education. Strengthened management and accountability in the education system could also help to address these issues.

Higher levels of educational attainment will likely help to improve employment, but this also requires that economic growth and productivity pick up in order to provide the jobs that are needed. Labour institutions present a somewhat opaque burden, especially collective wage bargaining and similar mechanisms that extend coverage to small firms and whose effects on employment are hard to quantify. Labour market reforms (including wage determination, but also minimum wages) could be an important step to reduce unemployment. Market competition is limited in many sectors because of the country's legacy of market-dominating firms. Making labour markets more flexible would help wages to become realigned with productivity. This could, in turn, support competitiveness, especially in small firms and formalisation of informal firms, which would generally benefit from more support to entrepreneurship. Continuing to prosecute and sanction cases of excessive market power and limiting industry concentration is crucial to support a level playing field for small and new firms, with the potential to absorb an increasing labour force.

Reforms in the area of energy provision could considerably improve efficiency in the economy, with spillovers into other areas. The envisaged price increases in the next years will help to further lower implicit subsidies for households and companies, remove distortions in private sector production, and improve energy efficiency. In the longer run, the country may want to give greater consideration to greener growth in order not to waste its environmental resources. Eliminating distortions from subsidies in electricity allocation would also have positive environmental spillover effects in this regard.

Key considerations for boosting productivity in the BRIICS

The performance of the BRIICS (Brazil, the Russian Federation, India, Indonesia, China and South Africa) will be essential for continuing the process of shifting the weight of economic activity from OECD to non-OECD countries. Moreover, the diversity of BRIICS' development experiences and the challenges and opportunities they face may be of interest to other developing countries as they craft their own development strategies.

Three of the economies – Brazil, the Russian Federation and South Africa – are resource-rich and face some greater challenges in diversification. The Russian Federation is rich in many natural resources, but oil and gas have been the key drivers of its recent growth. Brazil's recent export growth has been driven by agricultural and mining products. South Africa's has been driven mostly by mining, although like Brazil, manufacturing exports were the most important until roughly 2000 when the strong demand for commodity exports shifted their comparative advantage back to natural resource-based exports. China and India are labour-rich and relatively natural resource poor. Their exports have been driven mostly by manufactured products. However, India stands out among the BRIICS in the importance of information-enabled services exports. Indonesia is both a labour- and natural resource-rich economy. Its exports were initially based mostly on fuel related natural resources which were gradually overtaken by manufactured exports by 2000. However, as in Brazil and South Africa, Indonesia's exports have gone back to being mostly natural resource-driven.

Productivity improvement is key for continued growth in the BRIICS. Total factor productivity (TFP) growth has contributed significantly to overall economic growth in India, China and the Russian Federation during the last two decades. Growth in the other three BRIICS was less productivity-driven during the same period. Productivity levels (TFP and labour productivity) in all BRIICS are still very low compared to those in advanced countries.

Productivity growth is important at all stages of economic development. In earlier phases, this includes mainly shifting labour from low productivity agriculture to higher productivity agriculture, industry and services and more intensive use of capital and labour:

- The BRIICS vary in the extent to which they can gain from broad economic restructuring from low productivity agriculture to higher productivity industry and services. The economic structure of the Russian Federation, Brazil and South Africa is already closer to that of OECD countries, although gains through shifting labour out of agriculture still contributed to some productivity improvements during the last decade in Brazil. India, Indonesia, and to a lesser extent China still have significant room in this dimension given their significant rural populations involved in low productivity agriculture.
- The expansion of employment contributed significantly to growth in most BRIICS during the last two decades (except in the Russian Federation). India and South Africa still have significant room to use labour more effectively in the years ahead because of their low labour force participation rates, and in the case of South Africa, persistently very high unemployment rates.
- The BRIICS vary in the average levels of educational attainment. The Russian Federation has educational attainment levels higher than the OECD average. India and Indonesia have educational attainment levels at about half the OECD average. All but the Russian Federation can benefit from increasing average educational attainment. However, all, even the Russian Federation, need to improve the quality of education and better match the supply of education to the needs of their economies.

Key considerations for boosting productivity in the BRIICS *(cont.)*

- All BRIICS still have significantly lower capital stocks in per capita terms compared to more advanced countries. Accordingly, capital accumulation continued to be the most important driver of economic growth in these countries during the past decades and those with (increasingly) higher shares of investment in GDP tend to have higher overall growth (such as India and China). Thus, Brazil, the Russian Federation and Indonesia could increase their investment rate. In China, the key is to increase investment efficiency.

These initial productivity drivers – to various extents and in different areas – continue to be important in the BRIICS. However, boosting productivity through diversification into higher value segments within agriculture, industry and services will be essential. Likewise, technological catch-up and developing more effective ways to produce and deliver goods and services will become more important to allow sustained growth in these emerging economies:

- China and India have diversified their economies during the last two decades and China thereby managed to move up the value chain, at least in manufacturing. The resource-rich BRIICS (Brazil, Russian Federation, Indonesia and South Africa) have also moved into higher-value activities in agriculture and other resource sectors, but the overall level of diversification was reduced during the ongoing commodity price boom. Moving forward, the BRIICS should continuously seek ways to diversify into higher value sectors. This will also reduce vulnerability to external shocks and provide their economies with a wider range of skills and capabilities to move into higher productivity new activities.
- China has been very effective in tapping global knowledge by importing foreign technologies embodied in capital goods and inward foreign direct investment (FDI). Moreover, it has massively invested in technical human capital accumulation, which in turn determines the absorption capability of global knowledge. Other BRIICS can still better integrate in the global trading system and also need to develop the appropriate skills to absorb this knowledge.
- The BRIICS also need to innovate new products, processes, services and forms of organisation that are better suited to their needs than what they can get from abroad. Developing their own frontier-shifting innovations would also help to create competitive edges. R&D can help in the more technological-related areas. China has become the second largest spender in R&D in the world. Brazil, the Russian Federation and India also spend about as much as Italy or Spain.
- The development of productive, innovative businesses in some BRIICS is constrained by an inadequate regulatory environment and lack of skills. Regulatory burdens for businesses in Brazil, India and Indonesia, for example, are still very high compared to international standards. The protection of property rights is a concern in the Russian Federation. In South Africa, labour market flexibility is undermined, whereas in the Russian Federation the labour market is highly flexible but employment protection standards are low. All the BRIICS need to improve the supply of the changing skills mix demanded by their evolving economies. All the BRIICS also need to improve the depth and efficiency of their financial systems to allocate capital to higher productivity activities.
- The expansion of the services sector in the BRIICS (particularly in Indonesia and China, given their low service sector shares) is important to meet new demands of the growing middle classes, to increase competitiveness in manufacturing and to develop new export opportunities. India has found a niche in ICT-enabled service exports, but it still needs to move into higher value services and to do that it has to improve its higher education. All the BRIICS can benefit from more strategic development of their high value services.

Key considerations for boosting productivity in the BRIICS *(cont.)*

Beyond productivity improvements, BRIICS countries should foster equitable and sustainable development:

- Income inequality has risen in all the BRIICS, except Brazil and the Russian Federation, during the last decade. Income inequality is highest in South Africa and remains high in Brazil. Also, regional disparities are high in BRIICS countries. China has been effective in reducing some of these disparities through regional policies that directly addressed regional competitive edges and tailored public goods to the local needs. Furthermore, most of the BRIICS face social tensions. These tensions can be addressed by providing better public goods, employment opportunities, and greater voice in the economy.
- Environmental degradation is a challenge in all BRIICS countries, particularly China and the Russian Federation where rapid industrialisation has taken a heavy toll on the environment. On the energy side, all countries except Brazil have high energy use per unit of GDP compared to the OECD average, with the highest consumption in the Russian Federation and South Africa, followed by China. China is also facing the downside of rapid industrialisation from air pollution in its major cities which may become a serious health problem and is likely to reduce life expectancy for urban residents. Diversifying into less energy-intensive sectors and adopting energy efficient technologies would address some of these challenges.

Finally, maintaining rapid growth with equity and sustainable development requires capable and effective governance:

- Government vision and capability to implement difficult reforms have been important factors in the different development performances of the BRIICS. China's rapid rise had been in large part due to its determined, target-oriented government with a vision to address changing economic challenges. It made bold reforms which were possible through effective organisations and procedures to implement the necessary steps. Other BRIICS countries with more democratically-organised governments need to obtain support for necessary reforms through consultation processes where key stakeholders – including private businesses, local communities and civil society – can voice their opinion and help formulate and implement strategies.

Notes

1. These gaps are significant given that many OECD countries themselves have high unemployment rates and are thus underutilising their labour force.
2. TFP growth in the Russian Federation at the beginning of the 2000s may partly be due to a rapid increase in commodity prices. The deflators used may not fully account for these increases.
3. Real values of exports and imports were used. Nominal export and import values were deflated with export- and import-specific year-on-year price deflators (not deflators based on a base year).
4. A country has a revealed comparative advantage (RCA) in a product if the export share of that product in total exports of the country is higher than the export share of that product in total world exports.
5. Indonesia was not included in the 2013 PMR indicators.

References

AfDB, OECD, UNDP, ECA (2013), *African Economic Outlook 2013: Structural Transformation and Natural Resources*, OECD Publishing, *http://dx.doi.org/10.1787/aeo-2013-en*.

Alfaro, L. and A. Chari (2009), "India Transformed? Insights from the Firm Level 1988-2005", *NBER Working Paper* No. 15448, National Bureau of Economic Research, Cambridge, MA.

Arizala, F., E. Cavallo and A. Galindo (2009), *Financial Development and TFP Growth: Cross-country and Industry-level Evidence*, Inter-American Development Bank, *www.iadb.org*.

Arnold, J., B. Javorcik, M. Lipscomb and A. Mattoo (2010), "Services Reform and Manufacturing Performance: Evidence from India", in *CEPR Discussion Paper No. 8011*, Centre for Economic Policy Research, London.

ASER Centre (2012), "Annual Status of Education Report 2012", *ASER 2012 (Rural) Findings*, *www.asercentre.org*.

Barnard, G. (2009), "Realising South Africa's Employment Potential", *OECD Economics Department Working Papers*, No. 62, OECD Publishing.

Barro R. and J.W. Lee (2012), "A New Data Set of Educational Attainment in the World, 1950-2010", *Journal of Development Economics*, Vol. 104, pp. 184-198.

Berlemann, M. and J-E. Wesselhoft (2013), Estimating aggregate capital stocks using the perpetual inventory method – New empirical evidence for 103 countries, *www.hsu-hh.de/berlemann/index_VQxdoUqt6VmSoYt6.html*.

Bosworth, B., S.M. Collins and A. Virmani (2007), "Sources of Growth in the Indian Economy", in *India Policy Forum 2006/2007: Volume 3*, Sage Publications, India.

Canuto, O., M. Cavallari and J. Reis (2013), "Brazilian Exports: Climbing Down a Competitiveness Cliff", *World Bank Policy Research Working Paper*, 6302, Washington, DC.

Cao, C., R.P. Suttmeier and D.F. Simon (2006), "China's 15-year science and technology plan", feature article, *http://levin.suny.edu/pdf/physics%20Today-2006.pdf*.

Chen, V., A. Gupta, A. Therrien, G. Levanon and B. van Ark (2010), "Recent Productivity Developments in the World Economy: An Overview from The Conference Board Total Economy Database", in *International Productivity Monitor Number 19, Spring 2010*, Centre for the Study of Living Standards (CSLS) for Industry Canada.

Competition Commission of South Africa (2008), "Review of Changes in Industrial Structure and Competition", Input Paper for 15 Year Review, Policy & Research Division.

Credit Suisse (2013a), "The Brazilian Infrastructure: It's now or never, from an economic growth constraint to a plethora of opportunities", *https://doc.research-and-analytics.csfb.com/docView?document_id=x521421&serialid=hiY885dB/aC2ecvuH1fqd2mf5z7Lvtl26SiX%2BIMrn/Q%3D*.

Credit Suisse (2013b), "India: The Silent Transformation", in *India Market Strategy*.

De Holanda Barbosa, F. (1999), "Economic Development: The Brazilian Experience", (A. Hosono and N. Saavedra-Rivano, eds) in *Development Strategies in East Asia and Latin America*, St. Martin's Press, New York.

Denisova, I. (2012), "Income Distribution and Poverty in Russia", *OECD Social, Employment and Migration Working Papers* No. 132, OECD Publishing, Paris.

Department of Basic Education and Department of Higher Education and Training (2011), *Integrated Strategic Planning Framework for Teacher Education and Development in South Africa, 2011-25*, Technical Report, Pretoria, *www.education.gov.za/LinkClick.aspx?fileticket=lXfDtQxRz3M%3D&*.

Department of Trade and Industry (2014), "Industrial policy action plan – economic sectors and employment clusters", *www.thedti.gov.za/DownloadFileAction?id=851*.

Dobbs, R. et al. (2013) "Infrastructure productivity: How to save $1 trillion a year", McKinsey Global Institute, *www.mckinsey.com/insights/engineering_construction/infrastructure_productivity*.

EBRD (2012), *Diversifying Russia. Harnessing regional diversity*, European Bank for Reconstruction and Development, London.

Entrust Global Partners (2010), Brazil (Part 1) – Natural Resources and Environmental Sustainability. *Entrust Global Partners*, [blog] 5 March 2010, *www.entrustglobalpartners.com/* brazil-part-1-natural-resources-and-environmental-sustainability/.

ESCAP-World Bank (2013), ESCAP-World Bank trade cost database, *www.unescap.org/tid/artnet/%20trade-costs.asp*.

Hill, S. and T. Chalaux (2011), "Improving Access and Quality in the Indian Education System", *OECD Economics Department Working Paper No. 885*, OECD Publishing, Paris.

ILO (2013), *Key Indicators of the Labour Market (KILM)* (database), *www.ilo.org/empelm/what/WCMS_114240/lang--en/index.htm*

IMF (2013a), *World Economic Outlook, 2013*, International Monetary Fund, Washington, DC.

IMF (2013b), South Africa: 2013 Article IV Consultation, *IMF Country Report No. 13/303*, Washington, DC.

IMF (2012), India: 2013 Article IV Consultation, *IMF Country Report No. 13/37*, Washington, DC.

Kathuria, V., R.R. Seethamma Natarajan and K. Sen (2010), "Organised versus Unorganised Manufacturing Performance in the Post-Reform Period" in *Economic & Political Weekly*, Mumbai.

Klein, N. (2012), "Real Wage, Labor Productivity, and Employment Trends in South Africa: A Closer Look", *IMF Working Paper 12/92*, Washington, DC.

Koen, V., R. Herd and S. Hill (2013), "China's March to Prosperity: Reforms to Avoid the Middle-income Trap", OECD Economics Department Working Papers, No. 1093, OECD Publishing, Paris.

Lall, S. (2000), "The technological structure and performance of developing country manufactured exports, 1985-98", *QEH Working Paper* Number 44, *http://ideas.repec.org/p/qeh/qehwps/qehwps44.html*.

Latinobarómetro (2013), *Latinobarómetro Database* [online], *www.latinobarometro.org/lat.jsp*.

Lin, J. and Y. Li (2002), "Export and economic growth in China: A demand-oriented analysis", *Working Paper* No. C2002008, Peking University.

Magruder, J.R. (2011), "High Unemployment Yet Few Small Firms: The Role of Centralized Bargaining in South Africa", in *American Economic Journal: Applied Economics, Volume 4, Number 3, July 2012*, pp. 138-166(29), American Economic Association, Nashville, TN.

Ministry for Economic Development of the Russian Federation (2008), "Concept of Long-term Socio-Economic Development of the Russian Federation for the Period up to the year 2020", established by Government Decree of the Russian Federation of 17 November 2008, No. 1662-r.

Molnar, M., Y. Tatero and A. Suporsinchai (2013), "Capital Flows in Asia-Pacific: Control, Bonanzas and Sudden Stops", OECD Development Centre Working Papers, No. 320, OECD Publishing, Paris.

Mourougane, A. (2010). "Phasing out energy subsidies in Indonesia", *OECD Economics Department Working Papers* No. 808, OECD Publishing, Paris.

National Sample Survey Organisation (2008a), "Unorganised Manufacturing Sector in India: Employment, Assets and Borrowings", Government of India, Ministry of Statistics and Programme Implementation, NSS 62nd Round (July 2005-June 2006), Report No. 525 (62/2.2/2).

National Sample Survey Organisation (2008b), "Unorganised Manufacturing Sector in India: Input, Output and Value Added", Government of India, Ministry of Statistics and Programme Implementation, NSS 62nd Round (July 2005-June 2006), Report No. 525 (62/2.2/3).

National Treasury (2012), "Incentivising non-retirement savings", *Technical Discussion Paper D for Public Comment*, Pretoria.

OECD (2014a), *OECD Economic Outlook Database*, *http://dotstat.oecd.org/*.

OECD (2014b), *OECD-WTO Trade in Value Added* (TiVA), *http://dotstat.oecd.org/*.

OECD (2013a), *OECD Economic Surveys: Brazil 2013*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_surveys-bra-2013-en*.

OECD (2013b), *PISA 2012 Results: What Students Know and Can Do (Volume I): Student Performance in Mathematics, Reading and Science*, PISA, OECD Publishing, Paris.

OECD (2013c), OECD.Stat (database), *http://dotstat.oecd.org/*.

OECD (2013d), *Economic Outlook for Southeast Asia, China and India 2014: Beyond the Middle-Income Trap*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/saeo-2014-en*.

OECD (2013e), *OECD Economic Surveys: South Africa 2013*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_surveys-zaf-2013-en*.

OECD (2013f), *OECD Environmental Performance Reviews: South Africa 2013*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264202887-en*.

OECD (2011a), *Product Market Regulation Database*, *www.oecd.org/economy/pmr*.

OECD (2011b), *OECD Reviews of Innovation Policy: Russian Federation 2011*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264113138-en*.

OECD (2011c), *OECD Economic Surveys: India 2011*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_surveys-ind-2011-en*.

Pinheiro, A.C., Gill, I.S., Servén, L. and Thomas, M.R. (2004), "Brazilian Economic Growth, 1900-2000: Lessons and Policy Implications", in *Economic and Social Study Series*, Inter-American Development Bank Regional Operations Dept. 1.

Rasella, D., Aquina, R. Santos, C., Paes-Sousa, R. and Barreto, M.L. (2013), Effect of a conditional cash transfer programme on childhood mortality: a nationwide analysis of Brazilian municipalities, *The lancet*, Vol. 382, Issue 9886, p. 57-64.

Santos, L. Raes-Sousa, R. Miazagi, E. Silva, T. and Da Fonseca, A.M.M. (2011), "The Brazilian experience with conditional cash transfers: A successful way to reduce inequity and to improve health", World Conference on Social Determinants of Health, *www.who.int/sdhconference/resources/draft_background_paper1_brazil.pdf*.

The Conference Board (2014), The Conference Board Total Economy Database, *https://www.conference-board.org/data/economydatabase/*.

Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper* Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

UN Comtrade (2013), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx*.

UN-DESA (2013), *World Population Prospects* (database), *http://esa.un.org/unpd/wpp/unpp/panel_population.htm*.

UNESCO (2014), *UNESCO Institute for Statistics* (database), *www.uis.unesco.org/Pages/default.aspx*.

United Nations (2013), *UN Data* (database), *http://data.un.org/*.

World Bank (2013a), *World Development Indicators* (database), *databank.worldbank.org/*.

World Bank (2013b), *Enterprise Surveys* (database), *https://www.enterprisesurveys.org/*.

World Bank-PWC (2013), *Paying taxes 2013, the global picture*, *www.doingbusiness.org/reports/%20thematic-reports/paying-taxes/*.

Zhu and Kotz (2010), "The dependence of China's economic growth on exports and investment", *Working paper UNMASS*, *http://people.umass.edu/dmkotz/China_Growth_Model_%2010_09.pdf*.

ANNEX 6.A1

Methodological notes

Estimation method for total factor productivity at the sector level

The TFP estimation is based on a panel of 42 countries (including mostly OECD countries and the BRIICS, without South Africa) for 14 manufacturing and 18 service sectors for the years 1995-2009. The source of the data is the World Input Output Database (WIOD).

The estimation is based on a standard Cobb-Douglas production function with technological coefficients α for physical capital and β for labour:

$$Y_{i,c,t} = A_{i,c,t}\ (K_{i,c,t})^{\alpha}(L_{i,c,t})^{\beta} \qquad (1)$$

Where Y, A, K and L are: real value added, total factor productivity, real capital stock and number of employees, respectively. Real values are calculated using country- and industry-specific price deflators (with the base year of 2002). The nominal data is converted into US dollars using year average exchange rates from the WIOD.

The capital stock is not directly available and is therefore constructed based on investment data using the perpetual inventory approach. The initial capital K_0 is defined as follows (Arizala et al., 2009) (country and industry subscripts are omitted):

$$K_0 = \frac{I_0}{g+\delta} \qquad (2)$$

I_0 represents real gross fixed capital formation for a given industry in 1995, g corresponds to the average growth rate of investment between 1995 and 2002 and δ constitutes the depreciation rate of physical capital that is set to 8%.

Having determined the initial capital stock K_0, capital stock can be calculated for all subsequent years, as follows:

$$K_t = (1-\delta)^{*} K_{t-1} + I_{t-1} \qquad (3)$$

The following log-linearised production function is estimated for all sectors and countries at the same time (where smaller case letters stand for values in logarithmic form):

$$y_{i,c,t} = \alpha l_{i,c,t} + \beta k_{i,c,t} + \rho_c + \mu_i + \sigma_t + \varepsilon_{i,c,t} \qquad (4)$$

The log-linearised TFP estimates are defined as follows:

$$lTFP_{i,c,t} = \rho_c + \mu_i + \sigma_t + \varepsilon_{i,c,t} \qquad (5)$$

where ρ_c stands for the country-specific technological factor, μ_i for the sector-specific technology factor which does not vary across countries, σ_t for the time-dependent factor constant across countries and sectors. $\varepsilon_{i,c,t}$ is the residual of the regression and varies across sectors, countries and time.

ANNEX 6.A2

Additional tables and figures

Key indicators of the BRIICS

Table 6.A2.1. **Key economic indicators of the BRIICS**

	Brazil	China	India	Indonesia	Russian Federation	South Africa
GDP (current USD in billions)						
1990	462	357	327	114	517	112
2012	2 253	8 227	1 859	878	2 015	384
GDP per capita (current USD)						
1990	3 087	314	376	641	3 485	3 182
2012	11 340	6 091	1 503	3 557	14 037	7 352
GDP per capita, PPP (constant 2011 international $)						
1990	9 997	1 490	1 812	4 297	19 286	9 902
2012	14 301	10 771	5 050	8 856	23 184	11 989
Real GDP growth (% CAGR)						
1990-2000	2.54	10.42	5.58	4.22	-3.88	1.82
2000-12	3.31	10.15	7.21	5.42	4.67	3.44
Capital-labour ratio: total economy (% of US level)						
2000	27.1	5.6	6.0	2.8	14.5	No data
2008	29.1	9.5	3.9	3.0	32.3	No data
Capital-labour ratio: manufacturing (% of US level)						
2000	49.0	4.8	4.8	3.7	31.3	No data
2008	60.7	9.2	9.3	3.1	45.4	No data
Capital-labour ratio: services (% of US level)						
2000	28.0	9.5	9.2	4.1	10.5	No data
2008	27.6	14.3	4.6	4.1	26.7	No data
Labour productivity: total economy (% of US level)						
2000	12.1	2.4	1.7	3.1	6.1	NA
2008	11.1	5.3	2.4	3.1	9.1	NA
Labour productivity: manufacturing (% of US level)						
2000	4.3	5.1	2.1	6.5	6.9	NA
2008	7.4	7.0	2.2	5.2	7.4	NA
Labour productivity: services (% of US level)						
2000	7.0	3.5	3.5	3.3	7.3	NA
2008	11.8	7.1	7.1	3.5	11.2	NA
Total factor productivity (TFP): **total economy** (% of US level)						
2000	19.3	10.5	7.4	10.0	8.4	NA
2008	16.7	18.6	9.0	9.0	11.4	NA
Total factor productivity (TFP): **manufacturing** (% of US level)						
2000	20.1	15.6	6.5	22.2	10.7	NA
2008	13.4	21.5	7.8	19.8	8.8	NA
Total factor productivity (TFP): **services** (% of US level)						
2000	20.3	10.4	8.9	6.3	8.1	NA
2008	18.2	20.1	10.8	6.3	11.9	NA

Sources: Authors' calculations based on World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*; Timmer, M.P. (ed) (2012), "The World Input-Output Database (WIOD): Contents, Sources and Methods", *WIOD Working Paper,* Number 10, *www.wiod.org/publications/papers/wiod10.pdf*.

Table 6.A2.2. **Key social indicators of the BRIICS**

	Brazil	China	India	Indonesia	Russian Federation	South Africa
Population (million)						
1990	149.6	1 135.2	868.9	178.6	148.3	35.2
2012	198.7	1 350.7	1 236.7	246.9	143.5	52.3
Population growth rates (%)						
1990-2000	16.6	11.2	20.0	17.0	-1.3	25.0
2000-12	13.8	7.0	18.7	18.2	-1.9	18.8
Labour force growth rates (%)						
1990-2000	33.9	14.4	22.5	31.3	-5.4	45.7
2000-12	25.0	8.7	19.5	21.2	6.1	13.9
Life expectancy at birth (years)						
1990	66.5	69.5	58.5	63.4	68.9	62.1
2012	73.6	75.2	66.2	70.6	70.5	56.1
Poverty headcount ratio at USD 1.25 a day (PPP) (% of population)						
1990	17.2	60.2	49.4 (1994)	54.3	1.5 (1993)	24.3 (1993)
2009	6.1	11.8	32.7 (2010)	16.2 (2011)	0.0	13.8
Poverty headcount ratio at USD 2 a day (PPP) (% of population)						
1990	30.0	84.6	81.7 (1994)	84.6	8.3 (1993)	41.1 (1993)
2009	10.8	27.2	68.8 (2010)	43.3 (2011)	0.1	31.3
Gini index						
1990	61.0	32.4	30.8 (1994)	29.2	48.4 (1993)	59.3 (1993)
2009	54.7	42.1	33.9 (2010)	38.1 (2011)	40.1	63.1
School enrolment, tertiary (% gross)						
1990	10.8	3.1	5.9	8.5	54.7	12.0
2012	11.8 (1996)	26.7	24.8	31.5	76.1	15.0 (1994)

Sources: World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*; UNESCO (2014), *UNESCO Institute for Statistics* (database), *http://data.uis.unesco.org/*.

Table 6.A2.3. **Key environmental indicators of the BRIICS**

	Brazil	China	India	Indonesia	Russian Federation	South Africa
Total natural resources rents (% of GDP)						
1990	3.4	9.3	5.1	13.5	19.4	4.3
2000	3.9	3.2	3.6	14.6	44.5	1.6
2012	6.3	5.8	5.6	7.1	18.7	7.9
Arable land (hectares per person)						
1990	0.34	0.11	0.19	0.11	0.89*	0.36
2011	0.37	0.08	0.13	0.10	0.85	0.23
Renewable internal freshwater resources per capita (cubic meters)						
1992	35 046	2 415	1 600	10 918	29 007	1 221
2011	27 512	2 093	1 184	8 281	30 169	869
Energy use per $1 000 GDP (kg of oil equivalent per $1 000 GDP constant 2011 PPP)						
1990	93.7	514.8	201.1	128.5	307.4	261.0
2000	97.5	254.7	168.7	133.4	321.7	261.7
2011	95.9	202.1	125.7	101.6	227.2	231.3
Energy dependency (Net energy imports as % of energy use)**						
1990	25.7	-1.2	7.9	-70.9	-47.1	-25.9
2000	21.2	2.7	19.9	-52.9	-57.9	-33.3
2011	7.7	10.8	27.8	-88.8	-79.9	-15.0
CO_2 emissions (kt)						
1990	208 887	2 460 744	690 577	149 566	2 139 720*	333 514
2000	327 984	3 405 180	1 186 663	263 419	1 558 112	368 611
2010	419 754	8 286 892	2 008 823	433 989	1 740 776	460 124
CO_2 emissions (kg per 2011 PPP $ of GDP)						
1990	0.14	1.46	0.44	0.19	0.92*	0.96
2000	0.17	0.75	0.44	0.23	0.81	0.88
2010	0.15	0.67	0.36	0.22	0.56	0.78

Notes: * Figure from 1992; ** A negative value indicates that the country is a net exporter.
Source: World Bank (2014), *World Development Indicators* (database), *http://data.worldbank.org/data-catalog/world-development-indicators*.

Additional illustrations of the export structure of the BRIICS

Figure 6.A2.1. **China exported more capital goods in relative terms compared to the rest of the BRIICS**

StatLink http://dx.doi.org/10.1787/888933059167

Figure 6.A2.2. **Among the BRIICS, only China diversified into higher technology products**

StatLink http://dx.doi.org/10.1787/888933059186

Figure 6.A2.3. **Among the BRIICS, India and China have the lowest share of local value-added content of exports**

StatLink http://dx.doi.org/10.1787/888933059205

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Union takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the Organisation's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

OECD PUBLISHING, 2, rue André-Pascal, 75775 PARIS CEDEX 16
(41 2014 04 1 P) ISBN 978-92-64-21060-8 – 2014

Perspectives on Global Development 2014

BOOSTING PRODUCTIVITY TO MEET THE MIDDLE-INCOME CHALLENGE

Developing economies continue to grow faster than more advanced countries. Non-OECD countries' share in world GDP surpassed that of OECD countries in 2010. Since its first edition in 2010, the annual *Perspectives on Global Development* has investigated the trends in "shifting wealth", the increasing economic weight of developing countries in the world economy. "Shifting wealth" has received a boost through the rise of China, which has also led to positive spillover effects on developing economies that supply China's demand for resource-based products and intermediates. However, even at their higher rates of growth since 2000, the per capita incomes in developing countries – including many middle-income countries – will not reach the levels of developed countries by 2050. Boosting productivity growth in middle-income countries could stem this trend and is the focus of this report. At the same time, this growth needs to be inclusive so that a real convergence in living standards can take place.

Contents

Consult this publication on line at ***http://dx.doi.org/10.1787/persp_glob_dev-2014-en***

This work is published on the OECD iLibrary, which gathers all OECD books, periodicals and statistical databases.
Visit ***www.oecd-ilibrary.org*** for more information.

2014

OECD*publishing*
www.oecd.org/publishing

ISBN 978-92-64-21060-8
41 2014 04 1 P