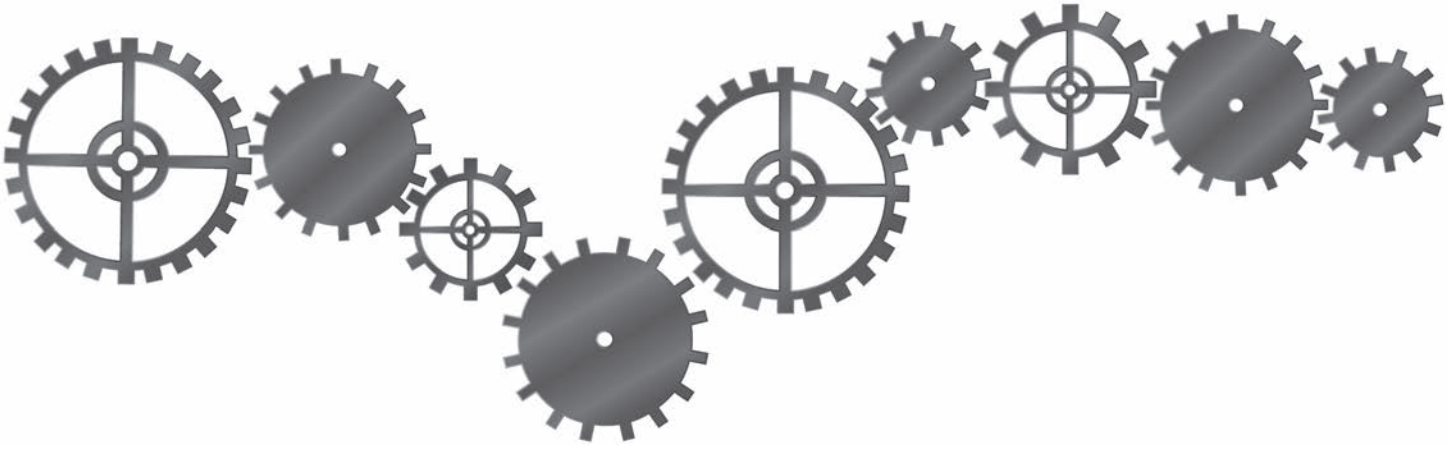
Perspectives on Global Development 2013

INDUSTRIAL POLICIES IN A CHANGING WORLD

Shifting up a Gear



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Perspectives on Global Development 2013

INDUSTRIAL POLICIES IN A CHANGING WORLD

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Foreword

Emerging economies and developing countries are playing an increasingly important role as new engines of global growth. The OECD described this gradual shift of the world's economic centre of gravity from North to South and from West to East in the its first edition of OECD Perspectives on Global Development, *published in 2010 under the title* Shifting Wealth. *In our second edition of this series,* Social Cohesion in a Shifting World, *published in 2012, we analysed the implications of Shifting Wealth for social cohesion and proposed an integrated policy framework for a sustainable, more cohesive policy agenda.*

Industrial Policies in a Changing World, *the third edition of* Perspectives on Global Development, *examines the opportunities and challenges presented for developing countries by the new geography of production and innovation.*

In an evolving economic landscape, many developing countries have sought to sustain growth, support structural transformation, and diversify and upgrade domestic production through industrial policies. Most countries are exploring new schemes to finance innovation, including through the use of sectoral technology funds and in some cases through sovereign wealth funds or new forms of Foreign Direct Investment (FDI). The report highlights some of the opportunities developing countries encounter as they move up value chains, increase South-South trade and explore new markets due to the emergence of a new middle class. It also analyses a wide range of measures, identifies core challenges, and provides findings that can help design and implement supportive policies.

The report concludes that three basic ingredients are necessary for successful industrial development in developing countries: investment in skills, access to financing and adequate infrastructure. Furthermore, a strategic framework is crucial for the effective implementation of industrial policy, coupled with political leadership, well-functioning institutions, and effective monitoring and evaluation.

This report, and the series Perspectives on Global Development *more broadly, can offer new insights and complement a number of OECD strategic priorities, including the initiative on* New Approaches to Economic Challenges, *recent work on measuring trade in value-added terms and global value chains, the Strategy on Development and the Skills Strategy, among others.*

The OECD will continue to provide innovative analysis and policy recommendations to help countries adjust to the rapidly evolving global economic landscape, as well as to promote greater social cohesion, more inclusive and green growth, and ultimately better lives.

Angel Gurría
Secretary General

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Table of contents

Acronyms and abbreviations 12
Editorial 15
Executive summary 17
Overview 21

Chapter 1. **Shifting wealth and the new world economy** 31
Introduction 32
Shifting wealth encompasses a stock and a flow perspective 33
Shifting wealth is changing in nature and represents an evolving opportunity . . 43
Is shifting wealth sustainable or has it just been a temporary phenomenon linked to the first decade of the 21st century? 49
Conclusion 55
Notes 56
References 58

Chapter 2. **Channels of shifting wealth** 61
Introduction 62
Through what channels does shifting wealth affect other developing countries? . 62
Conclusion 83
Notes 84
References 85

Chapter 3. **The new productive landscape and the renewed interest of developing countries in industrial policy** 87
Introduction 88
The productive landscape is changing rapidly 88
Developing economies are still facing major competitive challenges 95
Developing economies are implementing industrial policies 102
Conclusions 114
Notes 115
References 116

Chapter 4. **Emerging issues in implementing industrial policy in developing economies** 121
Introduction 122
Avoiding lock-in and capture 122
Promoting upgrading and diversification 123
Empowering territories as agents of change 132
Seizing the potential of sustainable development 136

Monitoring implementation and evaluating impact 139
Conclusions 141
Notes 142
References 142

Chapter 5. **Upgrading skills for current and future needs** 147
Introduction 148
Why investing in skills matters 148
How skills mismatches affect developing countries 155
Addressing the skills challenge 162
Conclusion 178
Notes 179
References 180

Chapter 6. **Mobilising financial resources** 183
Introduction 184
Characterising the financing gap in developing countries 185
Development financial institutions can mitigate the financing gap 194
New instruments targeting SME needs in emerging economies 208
Conclusions 210
Notes 211
References 213

Chapter 7. **Bridging infrastructure gaps** 217
Introduction 218
The policy-making process in infrastructure 219
Financing infrastructure: Public investment 225
Financing infrastructure: Private-sector involvement 229
Conclusion 234
Notes 234
References 235

Chapter 8. **The political economy of industrial policies** 239
Introduction 240
Opening political space for industrial policies 241
The key role of building strategies 244
Effective implementation: the need for adequate institutional capabilities and co-ordination 245
Conclusion 248
References 249

Tables

1.1. The developing world's growing China linkage 46
1.2. The global development impact: From initial entry to sustained growth effects . 48
1.3. Spending by the global middle classes, 2010-25 49
2.1. Classification of countries by pricing in third markets, 2010 72
3.1. Recent initiatives in industrial policy, selected developing countries 108
3.2. Key features of industrial policies 109

4.1. Variety in regional institutional frameworks, selected developing economies 135
4.2. Sustainable development initiatives, selected developing economies, 2012 . . 138

Figures

0.1. Annual GDP growth rates by income group, 1985-2011 22
0.2. World top 20 manufacturers, 2010. 23
0.3. R&D investment and private-sector commitment in selected countries, 2009 25
0.4. Firms identifying an inadequately skilled workforce as a major constraint, 2010 27
0.5. Credit to SMEs as a percentage of total credit, 2010 28
1.1. Convergence in the world economy: the four-speed world in the 1990s and in the 2000s 34
1.2. Changes in net international investment positions between 2005 and 2010 . . 35
1.3. Key components of emerging market external assets and liabilities, 1995-2010 36
1.4. Pleasant and unpleasant public debt dynamics, 2000-17 37
1.5. Annual GDP growth rates by income group, 1980-2010 38
1.6. Non-OECD contribution to global GDP growth, 1990-2011. 39
1.7. Non-OECD share in world GDP, 1980-2011 39
1.8. Merchandise trade shares, 1970-2011 40
1.9. Sector trade shares 41
1.10. Foreign direct investment inflows by region, 2000-11 42
1.11. The shifting distribution of global economic power, 1990-2011 43
1.12. Poverty rates for the developing world, 1981-2008 44
1.13. China's share of world GDP, 1980-2010 50
1.14. India's share of world GDP, 1980-2010. 50
1.15. Chinese renminbi effective exchange rate index, 2000-12. 53
1.16. Transition from middle-income to advanced-economy levels 54
2.1. Natural resource endowment in per capita terms and export dependence, 2005. 65
2.2. Natural resource endowment as share of wealth and export dependence, 2005 66
2.3. Asian economies are increasingly integrated with China through supply chains 67
2.4. Flows of intermediate goods and services between and within regions 68
2.5. Hausmann's capability indicator ranking of selected countries, 2010. 70
2.6. Trends in competitive positions measured by unit labour costs in the manufacturing sector 71
2.7. Pricing by China and low and middle-income countries in the US market . . . 73
2.8. Shares of services exports in total exports and services value-added in GDP, 2009. 74
2.9. China's demand for commodities has been robust 75
2.10. China commands over 30% share in world imports of several metals 76
2.11. India's appetite for metal ores has been modest, but rapidly increasing 77
3.1. World top 20 manufacturers, 2010 89
3.2. Top 15 destinations of Chinese foreign direct investment outflows, 2003-12. . 90
3.3. Rising patenting in China, 1970-2011 90
3.4. PISA scores, China, 2009 91
3.5. Manufacturing, intensity and dynamism in developing economies, 2005-10 . 92
3.6. Scientific articles and co-authorship, 1998 and 2009 94
3.7. Country shares in total Patent Co-operation Treaty filings, 2000-11 94
3.8. Manufacturing by technological intensity, selected countries, 2000-09 96

3.9. World top 20 services exporters, 2010 97
3.10. Specialisation in exports of knowledge-intensive services, selected countries, 2010 97
3.11. R&D investment and private-sector commitment in selected countries, 2009 99
3.12. World top research and development investing companies, 2010 100
3.13. Trademark registrations in selected non-OECD economies 2004-10 101
3.14. Industrial policy governance, Brazil's Plano Maior, 2012 110
4.1. Budget for sectoral technology funds in Brazil, 1999-2011 125
4.2. Determinants for FDI, selected economies, 2003-12 127
4.3. Policy mix to support start-ups 130
4.4. Top 40 global fastest growing metropolitan areas, 2010-11 133
4.5. Patents in environmental-related technologies, developing economies 137
5.1. Education index and GDP per capita, 2010 149
5.2. Skills and economic growth: Transmission channels 150
5.3. Education and technology development 151
5.4. Global value chains and specialised professional skills 154
5.5. Ratios between education levels in non-OECD and OECD countries, 1980-2050. 155
5.6. Academic ranking of world universities (ARWU), Top 500 156
5.7. Percentage of employers reporting difficulty filling jobs, 2012 157
5.8. Firms identifying an inadequately skilled workforce as a major constraint, 2010 158
5.9. Unemployment rates by education level in selected MENA countries, 2010 . . 159
5.10. Long-term growth effects of spending USD 1 000 per person on education, United States 163
5.11. Typology of skills development policies 165
5.12. Priorities in skills development policies 166
5.13. The distribution of scholarships, 1977-98 174
5.14. Complementarities in effort choices 176
6.1. The structure of financial markets – private credit vs. GDP per capita, 2010 . . 186
6.2. Credit to SMEs as a percentage of total credit, 2010 187
6.3. Share of firms that identify financing as a major obstacle 188
6.4. Share of financing for investment through financial institutions 189
6.5. Share of bank loans in the financing of fixed assets, by firm size 189
6.6. Share of bank loans in the financing of working capital, by firm size 190
6.7. A diagnostic on the obstacles to SMEs' access to credit and the possible public response 191
6.8. Net interest margins in the banking sector, 2009 192
6.9. Overhead costs in the banking sector as a share of total assets, 2009 193
6.10. Deutsche Bank long-term credit 196
6.11. Performance within governmental financial institutions and private banks . . 200
6.12. Credit distribution of international financial institutions by maturity, 2007-10 . 206
7.1. Rate of execution in capital expenditures by region 227
7.2. Rate of execution in capital expenditures in Africa 228
7.3. Infrastructure investment with private participation, 1990-2010 230
7.4. Renegotiation of concession contracts in Chile, Colombia and Peru 231
7.5. Transport concessions with private participation in Africa, 1990-2010 233

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Acronyms and abbreviations

ABDI	Brazilian Agency of Industrial Development
AFPA	Association pour la Formation Professionnelle des Adultes (Association for Adult Professional Training, France)
ARWU	Academic Ranking of World Universities
BANCOLDEX	National Development Bank of Colombia
BNDES	National Development Bank of Brazil
CABRI	Collaborative Africa Budget Reform Initiative
CDC	CDC Group plc
CGS	Credit Guarantee Scheme
CINDE	Costa Rican Investment Promotion Agency
CIP	Competitive Industrial Performance
CNI	Brazilian National Confederation of Industry
COFIDES	Compañia Española de Financiación del Desarrollo (Spanish Development Financing Company)
CORFO	Corporación de Fomento de la Producción de Chile (National Corporation for Production Development)
DBJ	Development Bank of Japan
DEG	Deutsche Investitions und Entwicklungsgesellschaft (German Investment and Development Institution)
DFI	Development Finance Institution
DTI	Department of Trade and Industry, South Africa
EBRD	European Bank for Reconstruction and Development
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
EDFI	Association of European Development Finance Institutions
EFP	European Financing Partners
EIB	European Investment Bank
EPZ	Export Processing Zone
ETP	Economic Transformation Programme, Malaysia
EU	European Union
FDI	Foreign Direct Investment
FIC	Fund for Innovation and Competitiveness, China
FINEP	Funding Authority for Studies and Projects, Brazil
FINNFUND	Finnish Fund for Industrial Cooperation
FMO	Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden (Dutch Entrepreneurial Development Bank)
FTZ	Free Trade Zone
GDP	Gross Domestic Product

GTP	Government Transformation Programme, Malaysia
GVC	Global Value Chain
HTE	High-technology Exports
IBK	Industrial Bank of Korea
ICT	Information and Communications Technologies
IDA	Institute for Defense Analysis
IDC	Industrial Development Corporation, South Africa
IFI	International Financial Institution
KDB	Korea Development Bank
LDC	Least Developed Country
MENA	Middle East and North Africa
MIDA	Malaysian Industrial Development Authority
MIGA	Multilateral Investment Guarantee Agency
MGS	Mutual Guarantee Scheme
MNCs	Multinational Companies
NORFUND	Norwegian Investment Fund for Developing Countries
ODA	Official Development Assistance
OeEB	Oesterreichische Entwicklungbank (Austrian Development Bank)
PCG	Public Credit Guarantee
PEMANDU	Performance Management and Delivery Unit, Malaysia
PETS	Public Expenditure Tracking Surveys
PFI	Public Financial Institution
PGS	Public Guarantee Scheme
PISA	Programme for International Student Assessment
PROPARCO	Société de promotion et de participation pour la coopération économique (Investment and Promotions Company for Economic Cooperation, France)
R&D	Research and Development
RDA	Regional Development Authority
RFD	Results Framework Document, India
SIFEM	Swiss Investment Fund for Emerging Markets
SIMEST	Società Italiana per le Imprese all'Estero (Italian Financial Institution for the Development and Promotion of Italian Enterprises Abroad)
SME	Small and Medium-sized Enterprise
TA	Technical Assistance
TFP	Total Factor Productivity
TOKTEN	Transfer of Knowledge Through Expatriate Nationals
TVET	Technical and Vocational Educational Training
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
UNStat	United Nations Statistics Division
USSR	The Union of Soviet Socialist Republics
WTO	World Trade Organization

Editorial

The world has undergone profound and rapid transformations over the past decade, with the economic centre of gravity shifting towards Asia and the South. This process was initially driven by the integration of China and India into the world economy, but the story did not end there: a wider number of developing countries have already begun writing the next chapter. They are putting in place industrial policies, aimed at upgrading their productive structure and increasing their participation in global value chains. These policies also respond to a growing awareness about the risk of falling into a "middle-income trap" and experiencing economic stagnation and turbulence before getting to the desired level of development.

The third edition of Perspectives on Global Development 2013 *entitled* Industrial Policies in a Changing World *sheds light on the renewed interest in industrial policies in developing countries. In particular, the report highlights how industrial strategies can foster the structural transformation of the economy towards increased economic diversification and a more sophisticated production structure. This reform agenda touches on many policy areas ranging from innovation and skills to territorial development, SME financing and infrastructure.*

This report looks not only at what countries are doing but also at how they are doing it. A well-designed strategy is essential but it must go hand-in-hand with adequate budgetary resources, capabilities and institutional arrangements for successful implementation. It requires a conductor with political will and leadership to set the priorities and orchestrate actions in multiple fields. These are actionable principles, which influence the way budgets are conceived, how human resources are managed and how institutions interact.

The report Perspectives on Global Development 2013 *was prepared in collaboration with the Association of European Development Institutions. It draws on both policy analysis and policy dialogue carried out by the OECD Development Centre. Regional consultations focusing on experiences of industrial policy in Africa and Latin America were held respectively in Dakar (Senegal) and Rio de Janeiro (Brazil). Other initiatives undertaken at the OECD Development Centre have also fed into this report, namely the* Latin American Economic Outlook 2013, *which looks into SME policies for structural change, and the upcoming* African Economic Outlook 2013 *which focuses on structural transformation and natural resources. The next editions of the* Perspectives on Global Development *and the* Southeast Asian Economic Outlook *will further analyse the "middle-income trap" phenomenon.*

Mario Pezzini
Director
OECD Development Centre

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Executive summary

The last two decades have seen a shift in the centre of gravity of the global economy to Asia and the South. Since the mid-1990s, GDP growth in large and populous middle-income countries has substantially outpaced that of OECD countries. Despite concerns about the recent slowdown, this *shifting wealth* is a structural phenomenon that will persist and shape economic development in the future. Against this background, most developing countries have improved their macroeconomic management and started to implement industrial policies to address long-term structural issues.

The shift in the global economy poses competitive opportunities and challenges for policy makers in developing countries. New forms of foreign direct investment (FDI) and the delocalisation of high-value-added activities, previously kept in-house in advanced countries, are opening up opportunities for learning, innovation and for entering into new activities and sectors. At the same time, the growth of "middle classes" is opening new consumer markets. Developing products and services tailored to these new consumers, and adapting existing solutions to local needs, could provide incentives to diversify and upgrade domestic production. But competition is intense and growing, encouraging companies to increase rapidly their innovative capabilities in order to capture new customers.

Benefiting from these opportunities and successfully addressing these challenges depends on several factors, including countries' natural endowments, their size, level of integration in world markets and policy approaches. For instance, economies rich in natural resources are benefiting from rising terms of trade, but are also facing difficulties in investing in new activities, fostering production and diversifying exports. Some of these countries are trying to make better use of available revenues to finance industrial and regional development. In addition, small economies integrated into global value chains could take advantage of the new forms of FDI to generate linkages with the local economy, provided that they implement effective infrastructure and skills policies. Finally, large economies are benefiting from growing domestic demand as a source of growth and are also trying to identify new forms of partnership with foreign companies to enhance technology transfer and spillovers to domestic companies.

Since the last decade, many developing countries have showed a renewed interest in industrial policies. They are trying to diversify and enter into new sectors and activities, as well as to upgrade domestic production. The transformation of their production structures is increasingly considered as part of their strategies for achieving sustainable and inclusive growth. Countries like Brazil, China, India and South Africa are using schemes, such as sectoral technology funds and public procurement, to finance and promote innovation and upgrade production in priority areas. These countries are also fostering the creation of new firms, especially start-ups in areas related to information and communication technology.

Some countries, such as Brazil, Morocco and India are increasingly using FDI as a tool to foster innovation and industrial upgrading by promoting new forms of linkages between multinational companies (MNCs) and local firms and by privileging the attraction of more knowledge-intensive activities that could generate higher spillovers to the domestic economy. Others are exploring new ways of strengthening the competitiveness of existing firms by promoting cluster development and by strengthening backward and forward linkages. Finally, the pursuit of sustainable development creates further opportunities in new technologies and in environmentally friendly business models.

In designing and implementing policies for industrial development, developing countries are facing the challenge to overcome multiple barriers, especially in the fields of skills, financing for innovation and small and medium-sized enterprises (SMEs), and hard and soft infrastructure. Most of them are devising new strategies that mobilise investments in bundles to address the different constraints and to take advantage of the synergies between public action in different fields. In particular they focus on:

- A skilled workforce is necessary for industry upgrading as it stimulates innovation and helps countries move up global value chains. However, high investment in education does not guarantee that the acquired skills will necessarily correspond to the demands of the prodcution structure, or that human resources will be productively employed.
- Investment in innovation, the creation of new firms and increasing productivity in SMEs are often constrained by lack of financing. Public financial institutions, in particular development banks, are increasing their support on these fronts.
- Infrastructure gaps remain a major bottleneck to increasing competitiveness (about 60% of the world's infrastructure stock is located in high-income countries, 28% in middle-income and 12% in low-income countries). To advance, developing countries are recognising that it is necessary not only to invest more in infrastructure but also to improve decision making in this area.

Addressing production opportunities and challenges is crucial. But industrial policies *per se* are no guarantee of success. Resources to implement them, long-term commitment, implementation capabilities and monitoring are crucial. Co-ordination of actions in multiple fields and the capacity to reorient actions when goals are not achieved are also important. Many developing countries face strong internal pressures that prevent or delay otherwise desirable changes, in fact when prices are rising for raw materials the incentives to develop new activities tend to be low. In addition, the risk of failure in industrial policies is high: Information asymmetries reduce state planning capacities, governments face obstacles in quickly fine-tuning actions, and withdrawing support is difficult as lobbies will try to prevent change. Empowered institutions and incentive management schemes based on performance can help reduce the risks of capture.

Finally, industrial policy is highly specific to context and time. However, common requirements for designing and implementing industrial policies in developing countries include: *i)* enhanced capacity to generate and process information to carry out diagnoses and define performance indicators; *ii)* spaces for dialogue with the private sector to build partnerships and create synergies in investments; and *iii)* co-ordination capacities to align actions across levels of government and in different fields, including skills, infrastructure and long-term financing. Hence, the design and implementation of industrial policies would benefit from a structured policy dialogue among peers as countries learn to implement policies through trial and error and by sharing knowledge with others.

Chapter 1 of this report presents an overview of the shifting wealth phenomenon so far, while Chapter 2 looks at the different channels through which it is affecting developing economies. Chapter 3 describes the renewed interest in industrial policy in developing economies, while Chapter 4 presents the main challenges they face in implementing such policies. Chapter 5 analyses the skills mismatches within developing countries and the policies to reduce them. Chapter 6 describes the difficulties developing-country SMEs and non-traditional sectors face in obtaining finance and the new policies to address them. Chapter 7 focuses on infrastructure bottlenecks, identifying ways of improving policy cycle management, while Chapter 8 presents the political economy challenges of implementing industrial policies.

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Overview

Since the mid-1990s, economic growth rates in large and populous middle-income countries have substantially outpaced those in OECD countries (Figure 0.1). This has reshaped the global economy and favoured convergence in global income per capita. In the 2000s, 83 developing countries doubled OECD per capita growth rates, compared with only 12 in the 1990s. The process of "shifting wealth" was led by China and India, but other countries are also contributing to it, including Brazil and South Africa. In spite of the persistence of large gaps in income per capita between OECD and non-OECD economies and the wide inequality within developing countries, most developing countries have improved their macroeconomic management and have started to address long-term structural challenges. New forms of foreign direct investment (FDI) to and from developing countries, the increase in South-South trade and the demands from the new middle classes in developing countries are helping to open up new growth opportunities. Developing countries are still accumulating capital and labour but they are also improving their capabilities and increasingly using and producing innovations. However, mastering technology and knowledge in order to move up the value chain is still a goal to be achieved for most of them.

To address the new development challenges, some developing countries are implementing industrial policies to sustain growth by diversifying and upgrading domestic production. The renewed interest in industrial policy poses new challenges and opportunities for their policy makers. The new forms of FDI and the delocalisation of high-value-added activities, previously kept in-house in advanced countries, are opening up new opportunities for learning and for entering into new activities and sectors. Some developing countries are recognising the importance of well-functioning development banks to channel resources to production development, innovation and infrastructure; reducing their skills mismatch is also a key priority for many developing countries to facilitate production transformation.

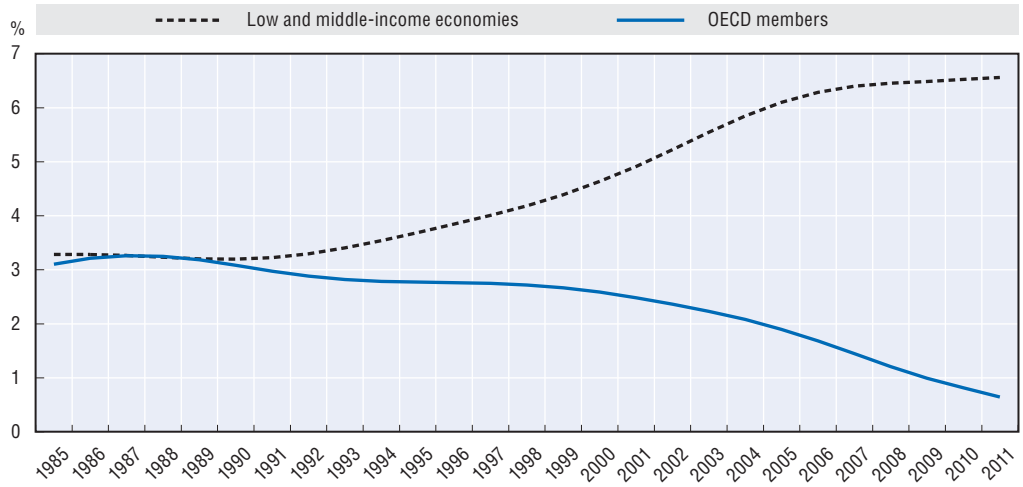
The first chapter of this report presents an overview of the shifting wealth process from its surge to its persisting effects. The second discusses the different channels through which the process of shifting wealth affects developing economies. The third chapter describes the renewed interest in industrial policy in developing economies. The fourth presents the main challenges that developing economies face in implementing industrial policy. The fifth chapter analyses the skills mismatches within developing countries and the policies to reduce them. The sixth describes the difficulties developing-country small and medium-sized enterprises (SMEs) face in obtaining finance and the new policies to address them. The seventh chapter focuses on infrastructure bottlenecks in developing economies and identifies ways of improving policy cycle management. Chapter 8 concludes, presenting the political economy challenges of implementing industrial policies in developing economies in the new global context.

The last two decades have seen an important change in the global economic landscape: a shift in the centre of gravity of the global economy to the East and the South.

Since the mid-1990s developing economies have been growing at higher rates than OECD economies (Figure 0.1) and since 2003 more than half of the world's economic growth has derived from non-OECD countries; by 2011, non-OECD economies accounted for more than 45% of world GDP (in purchasing power parity [PPP] terms). Concomitantly, most developing economies have reduced their macroeconomic vulnerabilities, rebalancing the composition of their liabilities away from foreign currency external debt and towards FDI and portfolio equity. Moreover, while world trade has expanded almost fourfold since 1990, South-South trade has multiplied more than ten times. Developing economies have also increased their global share of FDI inflows and outflows, absorbing more than half of global FDI inflows in 2010, against less than 20% in 2000. In 2010 they accounted for around 30% of global FDI outflows.

Figure 0.1. **Annual GDP growth rates by income group, 1985-2011**

Smoothed rates



Note: Chile, Mexico and Turkey are included both in low and middle-income economies and in the OECD.
Source: OECD calculations based on World Bank (2012), *World Development Indicators* (database), *http://data.worldbank.org/indicator* and OECD (2012), *OECD National Accounts Statistics* (database), *http://stats.oecd.org/*.

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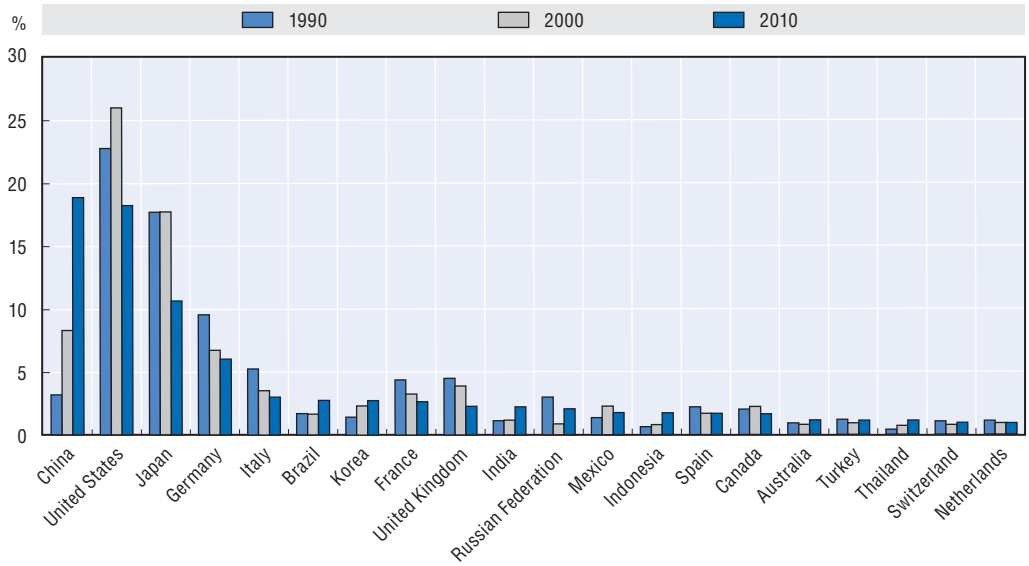
China is the main driver of shifting wealth but other countries are also contributing. China increased its share of world GDP from 3.5% in 1995 to 17% in 2011, and today it is also the world's largest manufacturer. In 2010 China's share of total world manufacturing value added (18.9%) outperformed that of the United States (18.2%) (Figure 0.2). Other developing economies are also playing an important role in the shifting wealth process, especially Brazil and India. India almost doubled its share in world GDP from 3% in 1995 to 5.6% in 2010. Both Brazil and India are among the top ten world manufacturers and their share in global manufacturing output increased steadily between 2000 and 2010. South-South trade and investment are also on the rise. China, India and Brazil have emerged as new partners for Africa. In 2011, China accounted for 17% of total African imports, up from only 5%

in 2000. India and Brazil increased their share in total African trade from 2.3% and 1.7% respectively in 2000, to 7% and 3% in 2011. Emerging countries are offering new forms of financing and promoting development. For example, China has been particularly active in investing in infrastructure, Brazil in knowledge and technology transfer in agribusiness, and India in generic drugs.

Figure 0.2. **World top 20 manufacturers, 2010**



Note: Manufacturing refers to industries belonging to International Standard Industrial Classification (ISIC) divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the ISIC, revision 3.

Source: UNStats (2012), *National Accounts Main Aggregates Database*, United Nations Statistics Division, *http://unstats.un.org/unsd/snaama/Introduction.asp* (accessed March 2012).

StatLink *http://dx.doi.org/10.1787/888932812623*

Despite concerns about the recent global economic slowdown, shifting wealth is a structural phenomenon and it will continue in the future. But its nature is changing, opening up new opportunities for development. Since 2008 the global economy has struggled to recover from the crisis and it is facing rising uncertainty and volatility. Although they have slowed, China and other developing economies are still growing considerably faster than OECD countries. Between 2009 and 2011, the average annual GDP growth rate in OECD countries was only 0.3% compared with 9.6% in China, 8.2% in India, 8.5% in emerging East Asia and Pacific countries, 4% in sub-Saharan Africa and 3% in Latin America. Currently, the combined GDP of China and India is equivalent to about one-third of that of the OECD area, but is expected to exceed it by 2060. From its initial surge, when the process of shifting wealth was mostly linked to the rise and progressive integration of China into global markets, this process is now moving towards another stage, characterised by a process of structural transformation and accumulation of capabilities, know-how, skills and financial assets in developing economies. In addition, the emergence of almost 4 billion middle-class consumers by 2025 will open new opportunities for growth and development.

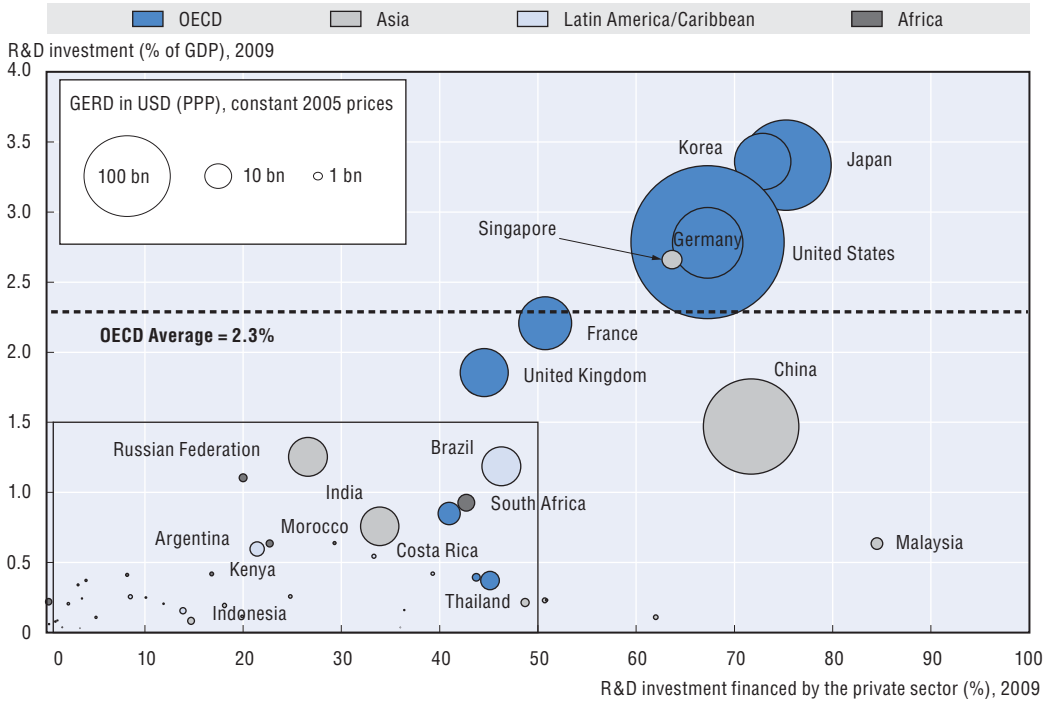
Developing economies are not only accumulating capital and labour; they are also increasingly using and producing innovations.

As well as continuing to accumulate capital and labour, developing economies are also increasing their innovation capabilities, though they still lag behind OECD countries. Innovation, i.e. the capacity to create new and better products and services, as well as new business models, is increasingly needed to compete effectively in global markets. In this context, China and, to a lesser extent, other developing economies have made great progress in the last decades. Nevertheless, this capacity not only to use but also to produce innovation is advancing slowly. Developing economies are introducing new business models and brands: China, for example, was among the top five countries for trademark applications and registrations in 2010. Trademark registrations are also rising in the Russian Federation, Brazil and South Africa, although on a smaller scale. However, the capacity to produce innovations has some way to go. Whereas OECD countries on average invested 2.3% of their GDP in research and development (R&D) in 2009, China invested 1.5% of its GDP, and other developing countries, including Brazil, the Russian Federation and India, invested less than 1%. In addition, private-sector involvement in innovation is low. Apart from China, the private sector in developing countries generally finances less than 50% of total R&D investment, compared with more than 60% of total R&D spending in OECD countries (Figure 0.3). Finally, the accumulation of innovation capabilities within developing economies is regionally unbalanced; a few regions are increasingly embedded in global innovation networks, whereas the rest of the economy operates at much lower levels of productivity or even in the informal sector.

The growth of "middle classes" in developing countries is opening new consumer markets. Developing products and services tailored to them, and adapting existing solutions to local needs, will provide powerful incentives to diversify and upgrade domestic production. But competition to gain access to this potential demand is intense and it will increase. Already established companies, especially multinationals, are looking at these new "middle classes" as potential consumers and it is likely that they will deploy strategies to tap into them. Domestic companies in developing countries will need to increase their innovative capabilities rapidly to capture these new demands.

The changing global economic context opens new opportunities for learning and innovation in developing economies, depending on their endowments, size, integration in world markets and targeted policies. Natural resource-rich economies are benefiting from rising terms of trade, but are also facing difficulties in investing in new activities and in fostering production and export diversification. Some countries are profiting from the rise in revenues from natural resource extraction to establish new mechanisms to finance industrial and regional development. Small economies integrated into global value chains can take advantage of these new forms of FDI and generate linkages with the local economy, provided that they implement effective policies to develop adequate infrastructure and skills. Some large economies are shifting towards a new growth model that increasingly relies on growing domestic demand as an additional source of growth. Therefore these economies are on the one hand trying to identify new forms of partnership with foreign companies to enhance technology transfer and linkages with domestic companies; on the other hand they are investing in supporting the development of small and medium-sized enterprises (SMEs) and innovation to better adapt to the changing economic landscape.

Figure 0.3. **R&D investment and private-sector commitment in selected countries, 2009**



Note: 2009 or latest available year.

Sources: Authors' calculations based on OECD (2012g), *Main Science and Technology Indicators* (database), *http://stats.oecd.org/* for OECD countries, RICYT (2012), *Red de Indicadores de Ciencia y Tecnologia* (database), Ibero-American and Inter-American Network of Science and Technology Indicators, *www.ricyt.org/* for Latin America and the Caribbean and UNESCO (2012), *UNESCO Institute for Statistics Database*, *www.uis.unesco.org/Pages/default.aspx* for other countries.

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However, developing countries are facing multiple challenges to maintain high growth rates. To face the new global economic context they are implementing industrial polices to upgrade and transform their production structures and keep growing.

Since the early 2000s, some developing economies have started to implement industrial policies. In Latin America the pioneer has been Brazil, where the return of industrial policy dates back to 2003. South Africa made a serious commitment to relaunching industrial policy in 2007 and Morocco embarked upon an initiative for industrial development in 2005. Increasing the competitiveness of existing firms, supporting the creation of new firms and entering into new sectors and activities are three major goals for industrial policy in developing economies. Each country has a specific institutional setting that shapes the process of policy design and implementation. Ministries of industry are often responsible for policy planning. Development banks are regaining ground as key institutions in strategy setting (Brazil) and in financing (South Africa). In some cases, sovereign wealth funds are also increasingly used to finance production development. Regions and local governments play different roles; for example in Brazil and China industrial policy is managed by both national and regional institutions,

while in South Africa it is more centralised. Industrial policies in developing economies increasingly include territorial inclusion and social cohesion as priorities, in addition to growth and job creation. A major challenge for developing economies is to articulate actions in the different fields that are determinant for achieving production transformation, including skills, infrastructure and finance and to define the appropriate mechanisms to monitor implementation and evaluate the effectiveness of these policies to increase their impact or redefine their nature and scope. In addition, it is interesting to note that these issues are not only confined to developing economies: in the aftermath of the 2008 financial and economic crisis OECD countries have re-opened a debate on industrial policies to address job and competitive challenges.

Multiple factors explain the renewed interest in industrial policy in developing economies. In addition to globalisation and a booming China, the 2008 financial and economic crisis reopened the debate about the institutions and rules governing markets. Successful cases of catching up have been associated with the design and implementation of policies to sustain learning by experience; Korea and Chinese Taipei followed different models, but both had strong government incentives to foster the development of domestic production capabilities. Growth in developing economies has opened fiscal space for proactive policies that were not available in the 1980s and 1990s. For example, rising prices of raw materials have benefited natural resource-rich economies, and have encouraged some countries to identify new mechanisms to channel funds from natural resource extraction to innovation and regional development, as in Chile, Colombia, Peru and South Africa. However, other such countries have faced difficulties in investing in new activities and fostering production and export diversification.

Developing countries are exploring new ways to enter into new sectors and develop new activities. Most of them are implementing new schemes to finance innovation, including sectoral technology funds. Public procurement is also seen as a tool to promote innovation and production upgrading in priority areas, as in Brazil, China, India and South Africa. Developing economies are also fostering the creation of new firms, especially start-ups in areas related to information and communication technologies. In addition, developing countries such as Brazil, Morocco and India are increasingly using FDI as a tool to foster innovation and industrial upgrading by promoting linkages and technology transfer. Some developing countries are also prioritising sustainable development: they are investing in developing new technologies and in fostering the creation of new environmentally friendly business models. Development banks are often playing a key role in financing green innovations.

Developing countries are also exploring new mechanisms to strengthen the competitiveness of existing sectors. Cluster support contributes to both diversification and specialisation by fostering interaction and strengthening backward and forward linkages. Instruments to promote cluster development differ from traditional tools because they target the network of agents operating in a given geographical location, rather than individual firms. Promotion of clusters often includes incentives to strengthen linkages between firms, research centres, and provision of real services instead of subsidies. Public policies contribute to cluster development by favouring trust building between actors, by helping create linkages and collaboration, and by fostering innovation in products, processes and business models. Cluster promotion entails improving co-ordination with regional governments.

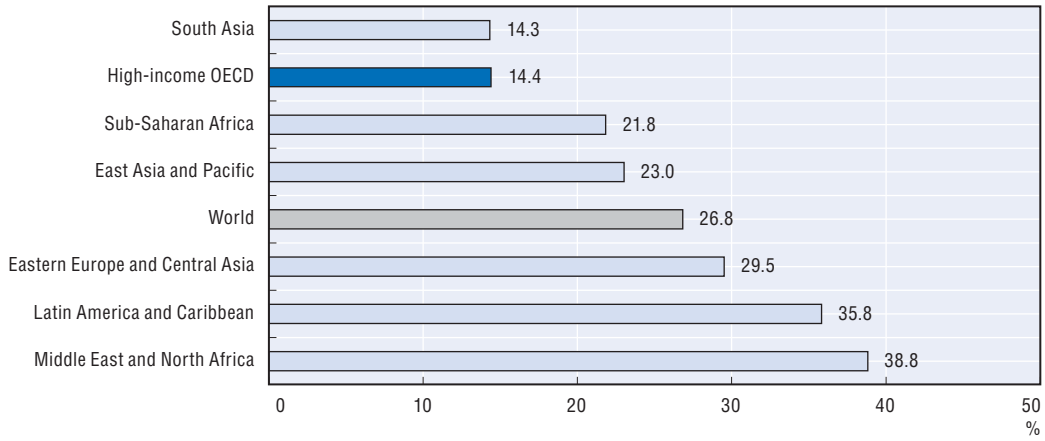
Creating jobs for the young and reducing the skills mismatches faced by developing countries are essential to improve the competitiveness of companies.

Skills development is part of the overall strategy for most countries actively engaged in industrial policy. A skilled workforce is necessary for industry upgrading; it stimulates innovation and helps countries move up the global value chains. However, high investment in education does not guarantee that the acquired skills will correspond to the demands of the production structure, or that the human resources will be productively employed. Skills mismatches hamper labour productivity and reduce the opportunity to profit from participating in global production networks. This problem is exacerbated when high-skilled workers migrate permanently from lower to higher-income countries.

In spite of improvements in recent decades, job creation and investment in skills development are still major challenges for developing countries. Skills shortages are particularly marked in Latin America and in Middle East and North African countries, even though governments there have invested significant amounts in education, in particular at the tertiary level (Figure 0.4). The lack of co-ordination between the main actors of the skills market, namely the public authorities in charge of education and employment, education institutions and students, employers, but also workers and job-seekers, contributes to explaining this gap.

Figure 0.4. **Firms identifying an inadequately skilled workforce as a major constraint, 2010**

Percentage of total firms per region in the survey



Notes: The indicator represents the percentage of firms per region identifying labour skills level as a major constraint. The computation of the indicator is based on the rating of the obstacle as a potential constraint to the current operations of the firm.

Source: OECD calculations based on World Bank (2012), *World Bank Enterprise Survey*, World Bank, Washington, DC.

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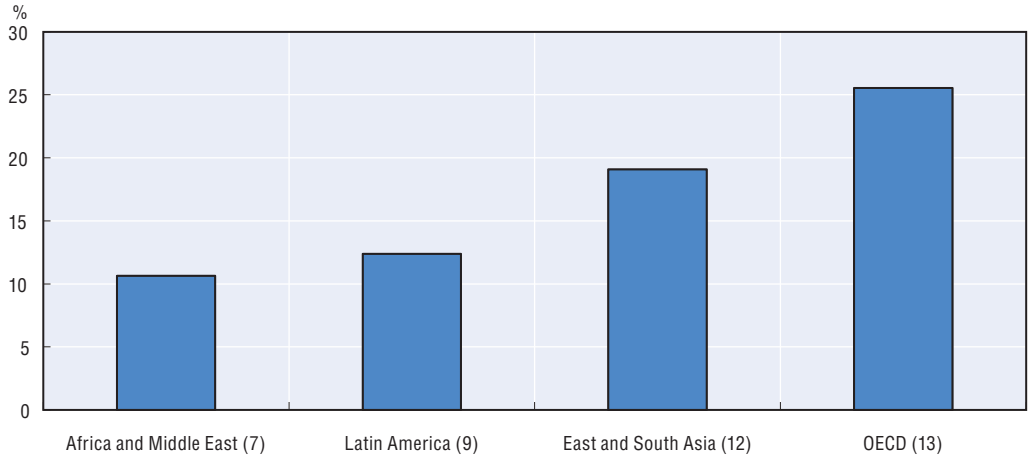
Many developing economies have already implemented reforms to improve both the quantity and quality of skills, and to reduce skills mismatches. Skills policies oriented towards industry upgrading should not only aim at investing in more and better skills, but also at aligning education with labour market needs, improving the school-to-work

transition, encouraging the long-term adaptability of skills and promoting the international mobility of skilled workers. Co-ordination between the main stakeholders in the skills market helps achieve the targets of industrial policy. For instance, in the countries that are targeting FDI inflows and participation in global value chains as ways to upgrade production, initiatives are needed to train young people in the fields demanded by the private sector (e.g. engineering in Costa Rica and technical staff in Morocco).

Developing economies are introducing new mechanisms to increase access to finance for companies, especially SMEs.

Companies in developing economies face more difficulties than those in OECD members in gaining access to long-term credit. The gap is particularly large for SMEs, even though they account for 85% of total employment. In 2010, SMEs received around 11% of total credit in Africa and the Middle East, less than 13% in Latin America and less than 20% in Southeast Asia, compared with nearly 25% in the OECD (Figure 0.5). Furthermore, while a large proportion of SMEs have no access to formal credit, long-term credit is even scarcer. Developing economies have put in place new instruments to increase access to finance for SMEs, including adapted banking tools (e.g. leasing, factoring) and instruments for distinct stages of business development (e.g. incubators, seed capital, risk capital). In addition, micro-finance has enhanced credit to micro and small firms and served as an intermediary step towards more formal financing channels.

Figure 0.5. **Credit to SMEs as a percentage of total credit, 2010**



Notes: SME definitions differ for each country; therefore ratios are not always comparable. Variables used for SME classification include number of employees, annual sales and loan size. For more information see Financial Access Report (CGAP). Africa and Middle East: Botswana, Cape Verde, Liberia, South Africa; Iran, Jordan, Morocco. Latin America: Argentina, Brazil, Costa Rica, El Salvador, Ecuador, Guatemala, Panama, Peru, Uruguay. East and South Asia: China; Hong Kong, China; Mongolia; Chinese Taipei; Afghanistan, Bangladesh, India, Indonesia, Malaysia, Pakistan, Singapore, Thailand. OECD: Australia, Belgium, Estonia, France, Hungary, Italy, Japan, Netherlands, Poland, Portugal, South Korea, Turkey, United States.

Source: CGAP (2010), *Financial Access 2010: The State of Financial Inclusion Through the Crisis, Consultative Group to Assist the Poor*, CGAP, Washington, DC.

StatLink http://dx.doi.org/10.1787/888932812680

Public financial institutions, particularly development banks and credit guarantee schemes, are increasing their support to firms to foster innovation and production development. The National Development Bank of Brazil and the Industrial Development Corporation in South Africa are active players in implementing industrial policies and have introduced new financial mechanisms to stimulate innovation in specific fields of national interest. Credit guarantee schemes have grown significantly over the last decade. Among them, public guarantee schemes, which are publicly funded, represent the main type of guarantee instrument. Institutionally, public financial institutions have learned from past experiences of repeated recapitalisations and losses. In many countries development banks have introduced management reforms to improve their financial performance and reduce their exposure. For example, they have established more independent and accountable boards of directors, clarified mandates and implemented new procedures for risk evaluation.

Infrastructure remains a major bottleneck to increasing competitiveness in developing countries.

Inadequate infrastructure hampers growth and harms competitiveness in developing economies. About 60% of the world's infrastructure stock is located in high-income countries, 28% in middle-income countries and 12% in low-income countries. In developing countries in 2009 there were about 1 billion people with no easy access to all-weather roads, about 1.5 billion people living without electricity, 800 million without access to safe drinking water and 4.7 billion people without access to the Internet. These infrastructure gaps jeopardise the efforts of domestic companies to raise their competitiveness.

To advance, developing countries need not only to invest more intensively in infrastructure but also to improve the management of the policy cycle. Governments should ensure that the budget preparation and authorisation phases are consistent with the country's development priorities. The prioritisation and planning phases are the most challenging issues in developing economies. Developing countries need to clarify the mechanisms for prioritising investment in infrastructure, as well as the forms for managing the necessary public-private partnerships. Building infrastructure requires better co-ordination between national and regional authorities, as well as clear predictability of budget execution. Co-ordination between different agencies in charge of infrastructure policies is essential to overcome the multiple gaps such as coverage, access and costs.

The evolving global economic context opens new challenges and opportunities for developing economies. Transforming their production structures is crucial to maintain high and inclusive growth.

Investing in transforming and upgrading the production structure is important for developing economies today, but industrial policy per se is no guarantee of success. That depends on a good plan, the resources to implement it, and long-term commitment and

implementation capabilities. It also requires the ability to co-ordinate actions in multiple fields and to reorient actions when goals are not achieved, and to create permanent spaces for dialogue with the relevant stakeholders (including firms, universities and civil society).

Many developing countries face strong internal pressures that prevent or delay otherwise desirable changes. For example, rising prices of raw materials enable traditional sectors to enjoy higher rents than technologically advanced sectors; therefore, market incentives to engage in new activities will be relatively low. In addition, the risks of failure in implementing industrial policies are high. Information asymmetries reduce state planning capacities, governments face obstacles in quickly fine-tuning actions and withdrawing support is difficult because lobbies will try to prevent change. However, empowered institutions and incentive management schemes based on performance help in dealing with the risks of capture and allow to increase the impact of policies.

Countries learn to implement policies through trial and error and by sharing knowledge with others. Industrial policy is highly specific to context and time, but common requirements for designing and implementing industrial policies in developing countries include:

- Improved domestic institutional capacities, at the national and regional levels.
- Enhanced capacity to generate and process information to carry out diagnoses of domestic and foreign trends with the aim of defining performance indicators and carrying out foresight exercises.
- Spaces for dialogue with the private sector to build partnerships, create synergies in investments, and favour information flows to identify priority areas for action; targeted mechanisms to channel resources in the medium and long term, matched with monitoring and evaluation.
- Co-ordination capacities to align actions across levels of governments and in different fields, including upgrading skills for current and future needs, improving infrastructure and ensuring a supply of long-term financing.

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Chapter 1

Shifting wealth and the new world economy

Doubts have intensified over whether the recent process of income convergence will continue. The growth performance of developing countries in the 2000s was indeed largely linked to China and other emerging economies. However, the economic challenges associated with China's rebalancing from investment-led to consumption-driven growth, and also doubts about whether other emerging economies can sustain their growth trend raise concerns regarding growth prospects. Nevertheless, the relatively low level of per capita income in many countries with a large population, which illustrates the significant space for catch-up growth, and the rise of the "middle classes" in such countries give reason for optimism. It is likely that the recalibration of the world economy will continue for the foreseeable future. Its scale will depend on what happens in large emerging economies as well as on domestic development policies.

Note: 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.

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 Islands. 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 Commission:* 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.

Introduction

The sustained growth that large emerging economies have experienced over the last decade has conferred on them a considerable positive growth differential over the OECD average. When combined with very large populations, these growth differences are reshaping the world economy. Their size, their low costs of production and their rapid accumulation of technological capabilities have had a deep impact on the global economic landscape and, for the first time in modern history, the countries with the largest economic mass are not also the richest countries. The shorthand for this complex event is what is called "*shifting wealth*", well documented in the two first issues of the OECD *Perspectives on Global Development*.

The chapter maintains that shifting wealth is here to stay, notwithstanding severe structural challenges to the process of income convergence. Recently doubts have grown as to whether the process of income convergence will continue. That the recalibration of the world economy toward the East and South could slow down has been argued on several fronts. There are discussions on the so-called middle-income trap; the need for rebalancing from export orientation toward domestic consumption; the changing sources of growth as middle-income countries converge further toward advanced-country income levels; the demographic, environmental and social limits to past growth patterns; and, last but not least, trade and capital protectionism, including by OECD countries. If nothing else, scepticism is booming. The media, which lionised China, India and Brazil as fast-growing superpowers-in-waiting, have started to portray these countries quite differently (see for instance Pilling, 2012). Like the previous issues of the *Perspectives on Global Development,* this report aims at adopting a long-term perspective that avoids purely cyclical considerations. The present chapter will discuss whether the process of convergence in GDP per capita triggered by the entry of more than 2 billion people with basic skills into a market-driven world economy will be derailed. And the message is that it will not. Even though the speed of convergence witnessed over the past decade is likely to slow, there are reasons to believe that in any case the recalibration of the world economy will continue and that the scale of this process will be linked to what happens in China and in other emerging economies.

The chapter first discusses the economic dimensions of the shifting wealth process, in particular its stock and its flow perspectives. It argues that the process has been driven mainly by large emerging economies and in particular by China. This has also implied a rebalancing of power. The chapter then describes how this process has influenced global development, with opportunities in terms of trade, financial flows and knowledge exchanges and with globally positive impacts in terms of growth and poverty reduction, despite the fact that some countries may have been hurt by increased competition, in particular from China. It also indicates how the process is likely to evolve in the new global context and concludes by explaining that, despite doubts on growth prospects linked to the economic, social and environmental challenges that emerging economies will face, there are strong fundamentals supporting the shifting wealth process for the future decades.

Shifting wealth encompasses a stock and a flow perspective

Over the past two decades, poles of strong growth have emerged in every developing region. Economic growth has been most visible in Asia (OECD, 2013), driven by the strong performance of China and India, but it has not been confined to that continent (Box 1.1). Sustained higher growth rates of large middle-income countries are reshaping the world economy. This recalibration of the world economy can be interpreted from a stock and from a flow perspective. Whereas the stock concept deals with the improvement in net foreign asset positions of emerging economies and the reduction of vulnerabilities to sudden stops in external capital flows, the flow concept deals with growth, trade and investment patterns. Certainly, as will be shown below, shifting wealth does not denote zero-sum redistribution of wealth, but tends to benefit low-income, middle-income and rich economies alike. It is rather about relative shifts in the world economy, from both the stock and flow perspectives.

As a stock concept, wealth has a very specific meaning. It is the net worth of a nation, household or person: the stock value of all financial and real assets owned minus liabilities owed at a particular point in time. Indeed, during the last decades there has been an increasing importance of equity financing and a significant improvement in the external position for emerging economies (see for instance estimates for the period 1970-2007 of external assets and liabilities for 178 economies, constructed by Lane and Milesi-Ferretti, 2007).

Box 1.1. **The "four-speed" world and the convergence process in the 2000s**

Over the last decade developing countries have, as a whole, enjoyed a revival in their economic fortunes after some 20 years of disappointing performance. To demonstrate better the shift from a world that still witnessed income divergence across countries in the 1990s to a world that has started to enjoy income convergence since 2000, the OECD *Perspectives on Global Development* have been extending former World Bank President James Wolfensohn's concept of a "four-speed" world. This splits the world into affluent, converging, struggling and poor countries according to their income and rate of growth per capita relative to the OECD area. In the 2000s as many as 83 developing countries managed to double OECD per capita growth rates (a measure used to define "converging countries"), compared with only 12 countries in the 1990s (Figure 1.1). The large number of converging economies in the 2000s was to a large extent not due to the lower growth rates in OECD economies, and globally growth in non-OECD economies significantly increased in the 2000s compared with the 1990s.

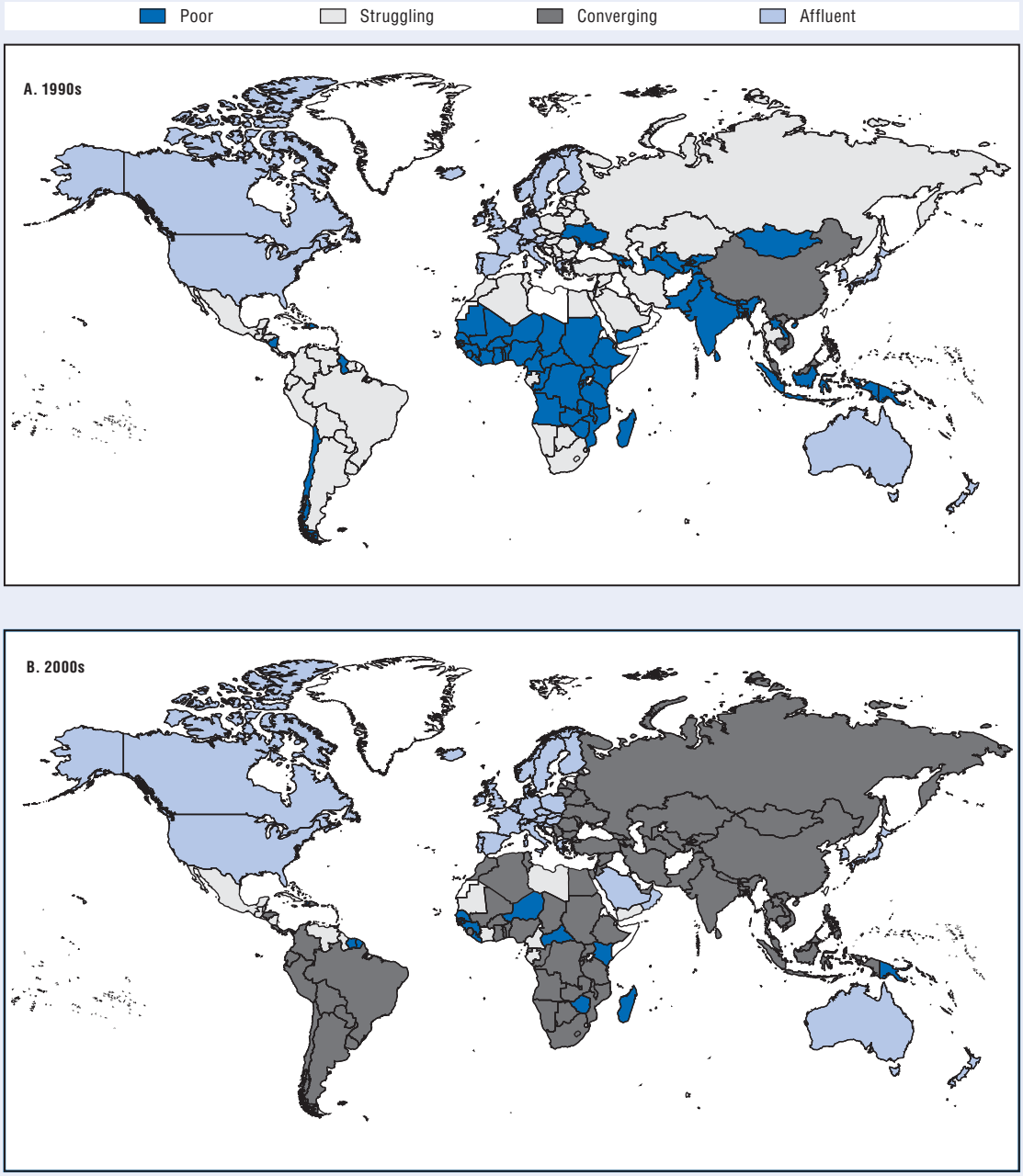
Despite the fact that a significant number of developing economies are closing the income gap with OECD economies, the distance is often still wide, and with the exception of China and some other countries, the pace of the narrowing of that gap is still slow. In 2010, 109 out of 181 countries still had a GDP per capita lower than 25% of that of the United States. Also, even considering the good performance of the last decade, only 60 countries had a rate of growth of their per capita income that would allow them, with the same growth rate, to double their income per capita in a period of less than 20 years.

Similarly, recent OECD forecasts until 2060 suggest that GDP per capita gaps will shrink but significant cross-country differences will persist (Johansson et al., 2012). In particular, heterogeneity between non-OECD and OECD economies will persist, as well as between non-OECD economies. They forecast, for instance, that China and India would experience more than a seven-fold increase of their income per capita by 2060. This would bring China 25% above the current (2011) income level of the United States, while income per capita in India would reach only around half the current US level.

Sources: OECD (2010), *Perspectives on Global Development 2010: Shifting Wealth*, OECD Publishing, Paris; and OECD (2012a), *Perspectives on Global Development 2012: Social Cohesion in a Shifting World*, OECD Publishing, Paris.

Box 1.1. **The "four-speed" world and the convergence process in the 2000s** *(cont.)*

Figure 1.1. **Convergence in the world economy: the four-speed world in the 1990s and in the 2000s**

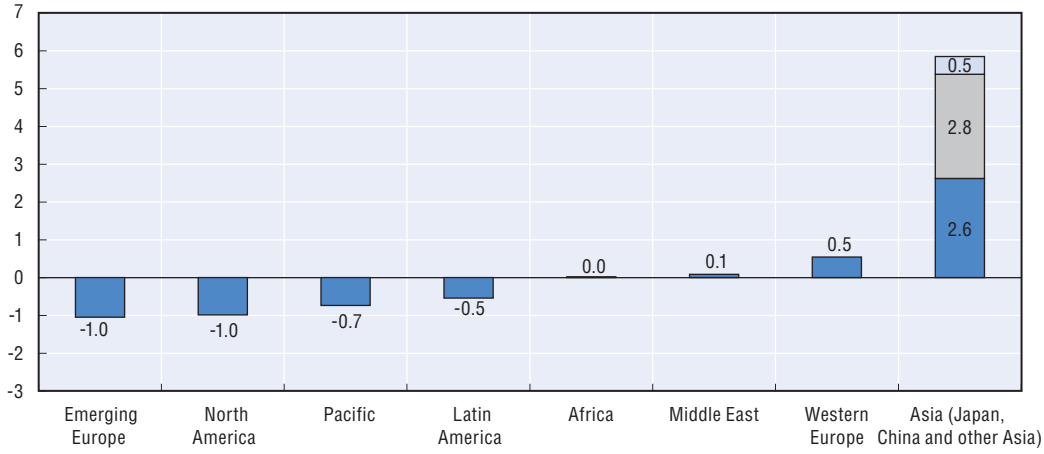


Note: See OECD (2010), *Perspectives on Global Development 2010: Shifting Wealth*, OECD Publishing, Paris, for a detailed description of the country classification used.
This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.
Source: OECD Development Centre's elaboration based on World Bank (2012), *World Development Indicators*, World Bank, Washington, DC.

The global current account imbalances of the past decade, which to a large extent reflected a high external US savings deficit financed increasingly by China and oil exporters, have given rise to a significant shift in wealth distribution toward surplus countries linked to production of fossil fuel and metal or excess savings. Rich OECD countries are being financed by countries which until recently played no substantial role as international investors. A much commented example is the role reversal between Angola and Portugal, with the former turning into a source of finance for the latter, which in turns sends people to its former colony. The United States is now the world's biggest debtor. Its net international investment position (NIIP – the difference between a country's residents' financial claims minus liabilities to the rest of the world) had sunk to a negative USD 3.5 trillion by 2008, equivalent to 24% of Gross Domestic Product (GDP). China's net foreign asset position, for a long time roughly in balance, turned positive from the early 2000s. Together with Japan, China has most extended its position as the world's international net creditor (Figure 1.2).

Figure 1.2. **Changes in net international investment positions between 2005 and 2010**

Percentage of world* GDP in 2010



Notes: * World is the sample of economies included in this figure. The aggregated GDP represents around 93% of World GDP in US dollars according to IMF database.
Emerging Europe: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, Turkey and Ukraine.
North America: Canada and the United States.
Pacific: Australia and New Zealand.
Latin America: Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.
Africa: Angola, Botswana, Côte d'Ivoire, Mauritius, Morocco, Nigeria, South Africa, Sudan and Tunisia.
Middle East: Bahrain, Egypt, Israel, Jordan, Kuwait and Yemen.
Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK.
Asia: Bangladesh, China, India, Indonesia, Japan, Pakistan, Philippines, Korea, Malaysia, Singapore and Thailand
In the column "Asia": Japan (2.6), China (2.8), other Asia (0.5).
Source: BBVA (2012), "China is the Only Global Creditor within BBVA EAGLEs", Hong Kong SAR, 12 February, using WEO data.

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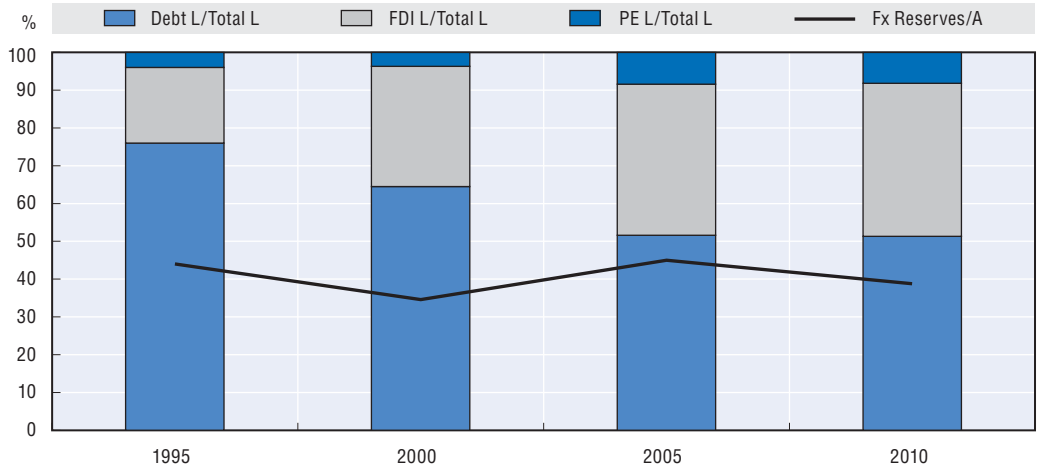
Although China has now started to internationalise the use of the renminbi (RMB) for trade, export credit and bonds, the emerging economies are as yet "immature" creditors which so far have not been able to provide foreign lending in their own currencies. Therefore they must contain the build-up of net foreign financial assets in foreign

currencies, as this will widen the currency mismatch in their own financial institutions. Currency mismatches have been shown in the 1990s financial crises to be time-bombs that can eventually impair balance sheets, produce bankruptcies and lead to deep slumps. This contingent currency risk provides a strong incentive to acquire more diversified foreign assets, including real assets. Investment vehicles such as sovereign wealth funds that mostly (with the notable exception of Norway) originate in emerging economies have grown in asset size and prominence. There are several reasons for emerging economies to build up sovereign wealth funds, rather than merely accumulating official foreign exchange reserves (Reisen, 2008). Beyond the monetary policy complications excessive reserves will entail portfolio diversification, efficiency gains, industrial policy, and coping with demographic pressures. The switch from Western sources of finance to those of emerging economies translates into a higher share of state-sponsored capital supply as opposed to purely private-sector sources.

Emerging markets have reduced longstanding vulnerabilities to sudden stops in external capital flows. While until recently foreign-currency external debt dominated the external liabilities of emerging economies, foreign direct investment (FDI) and portfolio equity account now for a majority of liabilities (Figure 1.3) (Prasad, 2011). Even external debt issued by these countries is increasingly denominated in their own currencies. This structure of liabilities is consistent with the objective of sharing risk across countries, with foreign investors bearing capital as well as currency risk on such investment. Developing countries should not only rely on national savings but encourage foreign direct and portfolio equity inflows as these broad flows add to growth after correcting for other standard growth determinants (Reisen and Soto, 2001). This finding holds also for Asian countries that save enough to finance investment at home but which would not gain the external benefits of equity flows under financial autarchy. By contrast, portfolio debt and bank loans together still constitute the major share of the external liabilities of advanced economies.

Figure 1.3. **Key components of emerging market external assets and liabilities, 1995-2010**

Medians



Note: L: liabilities; A: assets; PE: portfolio equity; fx reserves: foreign exchange reserves
Cross-sectional median values for each year for emerging countries.
Source: Prasad, E. (2011), "Role Reversal in Global Finance", *Brookings Paper*, Washington DC, 27 August.

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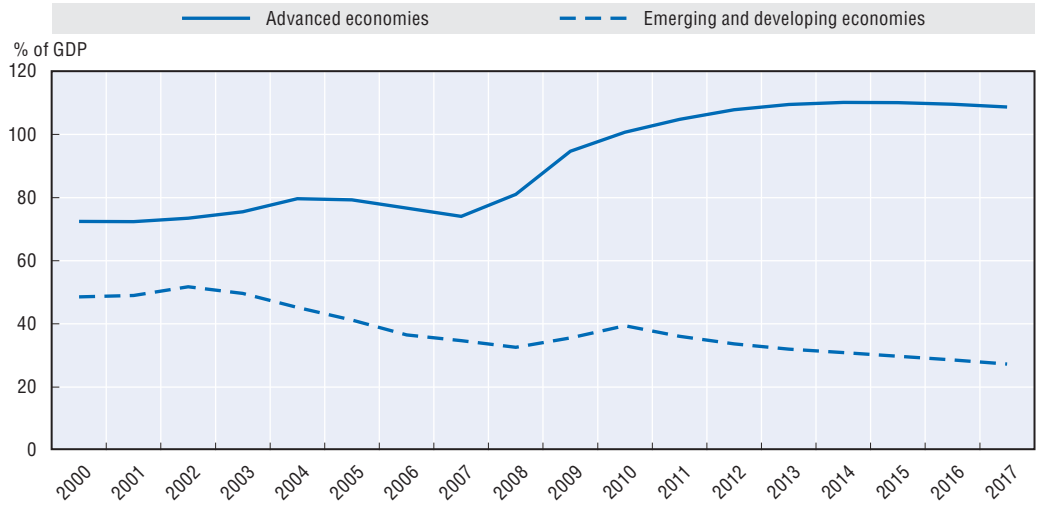
While their liabilities side is good news for emerging economies, the asset side, by contrast, is what must worry the emerging economies these days, despite the accumulation of reserves. The asset positions of emerging market external balance sheets (not just for China)[1] are becoming increasingly dominated by foreign exchange reserves, mostly held in government bonds issued by the four major reserve currency areas. Emerging economies, not just China,[2] but China above all, hold debt claims against OECD countries that find themselves on challenging fiscal trajectories as a result of very unpleasant debt dynamics – depressed growth and rising sovereign risk premiums (Figure 1.4).

Figure 1.4. **Pleasant and unpleasant public debt dynamics, 2000-17**

General government gross debt



Notes: Advanced economies consist of OECD economies without Chile, Hungary, Mexico, Poland and Turkey, and by adding Cyprus; Hong Kong, China; Malta; Singapore; Chinese Taipei.
Source: IMF (2011), *World Economic Outlook, 2011*. International Monetary Fund, Washington DC.

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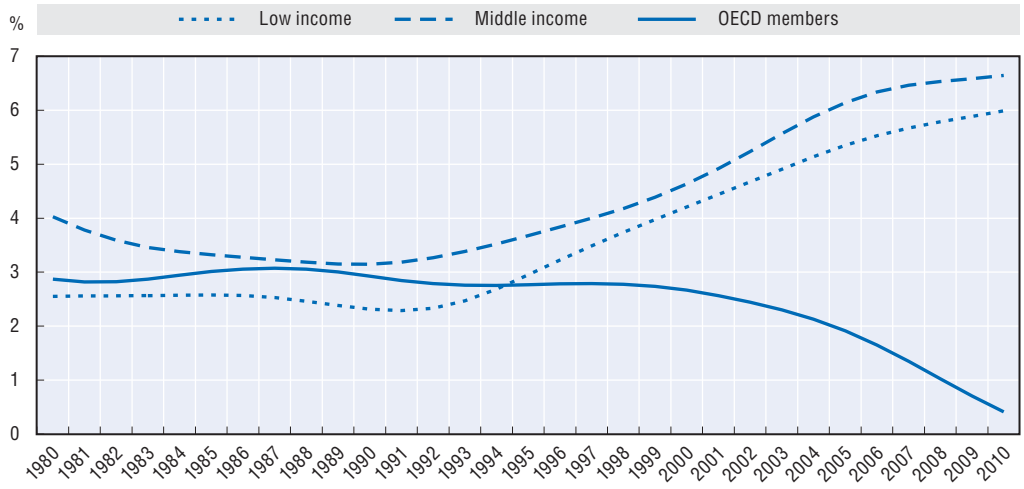
In turn, the drop in public debt ratios in emerging and developing countries has been a boon, creating fiscal space for more active policy intervention to sustain growth in the face of social and structural impediments. The drop has been largely endogenous to high GDP growth rates, lower sovereign risk premiums and improved non-interest budget balances as tax receipts have been rising in the wake of better raw material prices. It is obvious, therefore, that much of the improved state of developing and emerging-country public finances will depend on growth being sustained.

The flow concept of shifting wealth described wealth as "the annual produce of the land and labour of the society", using a flow, not a stock, concept, as it was fathered by Adam Smith (1776) in *An Inquiry into the Nature and Causes of the Wealth of Nations*. Developed and developing nations have witnessed a remarkable reversal of fortunes, by the yardstick of GDP growth rates. Figure 1.5 shows that until the mid-1990s OECD growth rates exceeded those of the low-income country group, implying income divergence across countries. Only since then have growth rates in developing countries on average exceeded

those in the OECD, which have started to drop sharply since the 2000s. Since the mid-1990s, there has been a striking decoupling of growth trends between, on the one side, OECD economies and, on the other, low and middle-income economies. The growth trends of these latter appear increasingly coupled, suggesting partial but rising endogenous South-South sources of growth.[3]

Figure 1.5. **Annual GDP growth rates by income group, 1980-2010**

Smoothed-curve representation, Hodrick-Prescott filter



Note: Chile, Mexico and Turkey are classified both in middle-income economies and in OECD.
Source: Authors' calculations based on World Bank (2012a), *World Development Indicators* (database), *http://data.worldbank.org/indicator* and OECD (2012b), *OECD National Accounts Statistics* (database), *http://stats.oecd.org/*.

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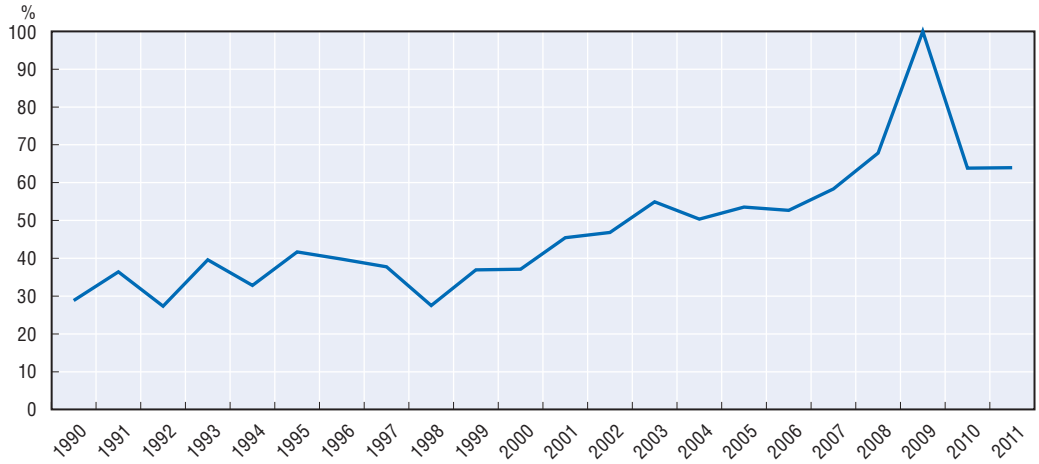
The sustained growth that large emerging economies have experienced over the past decade and more has given them a considerable growth advantage over the OECD average. The world has seen a shift in the engines of growth since the late 1990s, with a continued rise of global growth being driven from outside the OECD area. Combined with very large populations, these growth differences translate into a new world economy. Since 2003 more than half of world growth has derived from the non-OECD area (Figure 1.6).

For the first time in modern history, the countries with the largest economic mass are not also the richest countries. The multiplication of mass (population), the difference of growth rates relative to advanced countries and the duration of differential growth performances in favour of large emerging economies have changed the shape of the world economy. The shares in world product are being rebalanced towards the respective shares in world population between advanced countries and the rest, regardless of whether they are measured by purchasing power adjusted or by market exchange rates (Figure 1.7).

Figure 1.6. **Non-OECD contribution to global GDP growth, 1990-2011**

Percentage p.a.rate



Note: GDP growth in non-OECD members compensated negative GDP growth in OECD members in 2009; the contribution in this graph is limited at 100%.

Source: Authors' calculations based on World Bank (2012a), *World Development Indicators* (database), *http://data.worldbank.org/indicator* and OECD (2012b), *OECD National Accounts Statistics* (database), *http://stats.oecd.org/*.

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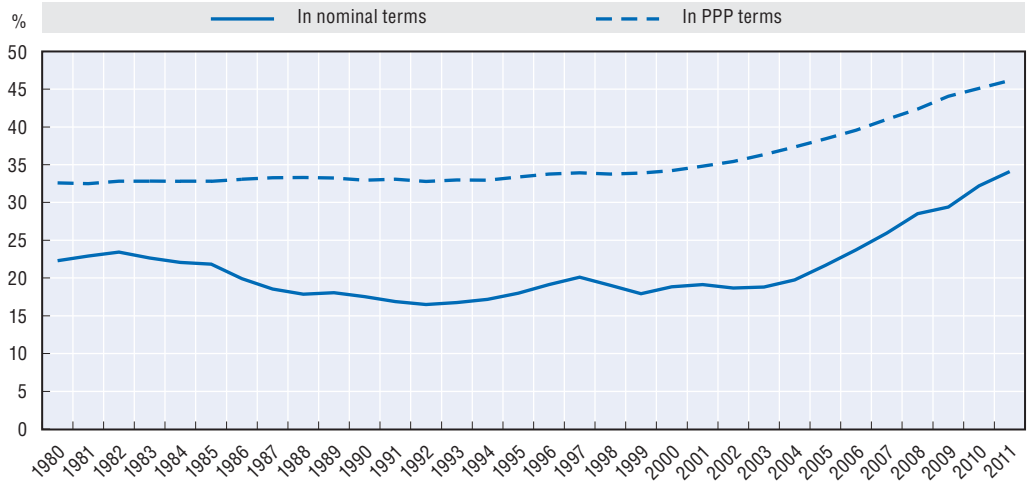
Figure 1.7. **Non-OECD share in world GDP, 1980-2011**

PPP and market exchange rates, percentage of world total



Source: Authors' calculations based on World Bank (2012a), *World Development Indicators* (database), *http://data.worldbank.org/indicator* and OECD (2012b), *OECD National Accounts Statistics* (database), *http://stats.oecd.org/*.

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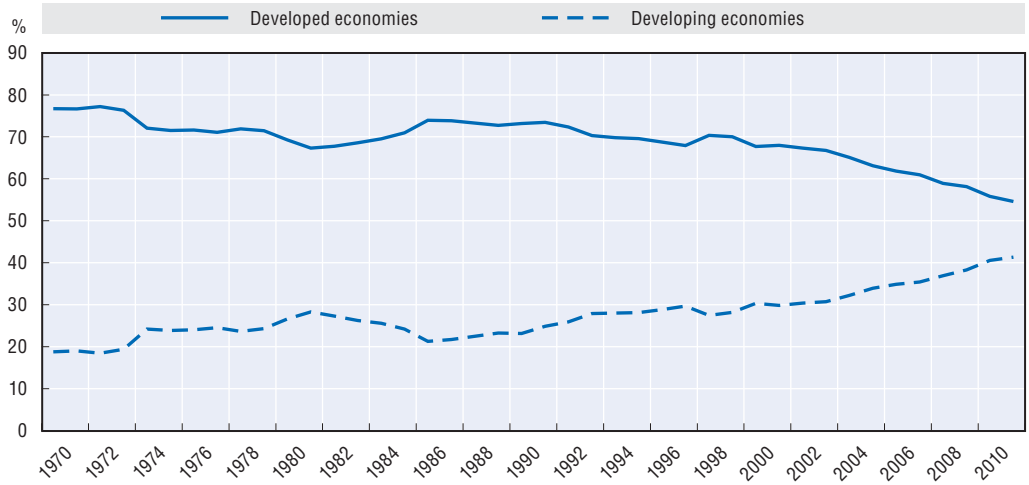
Global trade has both promoted and reflected shifting wealth in many ways. Over the period 1994-2011, the share of developing economies in global trade doubled (Figure 1.8).

Figure 1.8. **Merchandise trade shares, 1970-2011**

Exports plus imports, percentage of global trade



Note: The share of transition economies does not show in the figure.
Source: UNCTAD (2012), *UnctadStat* (database), *http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx*.

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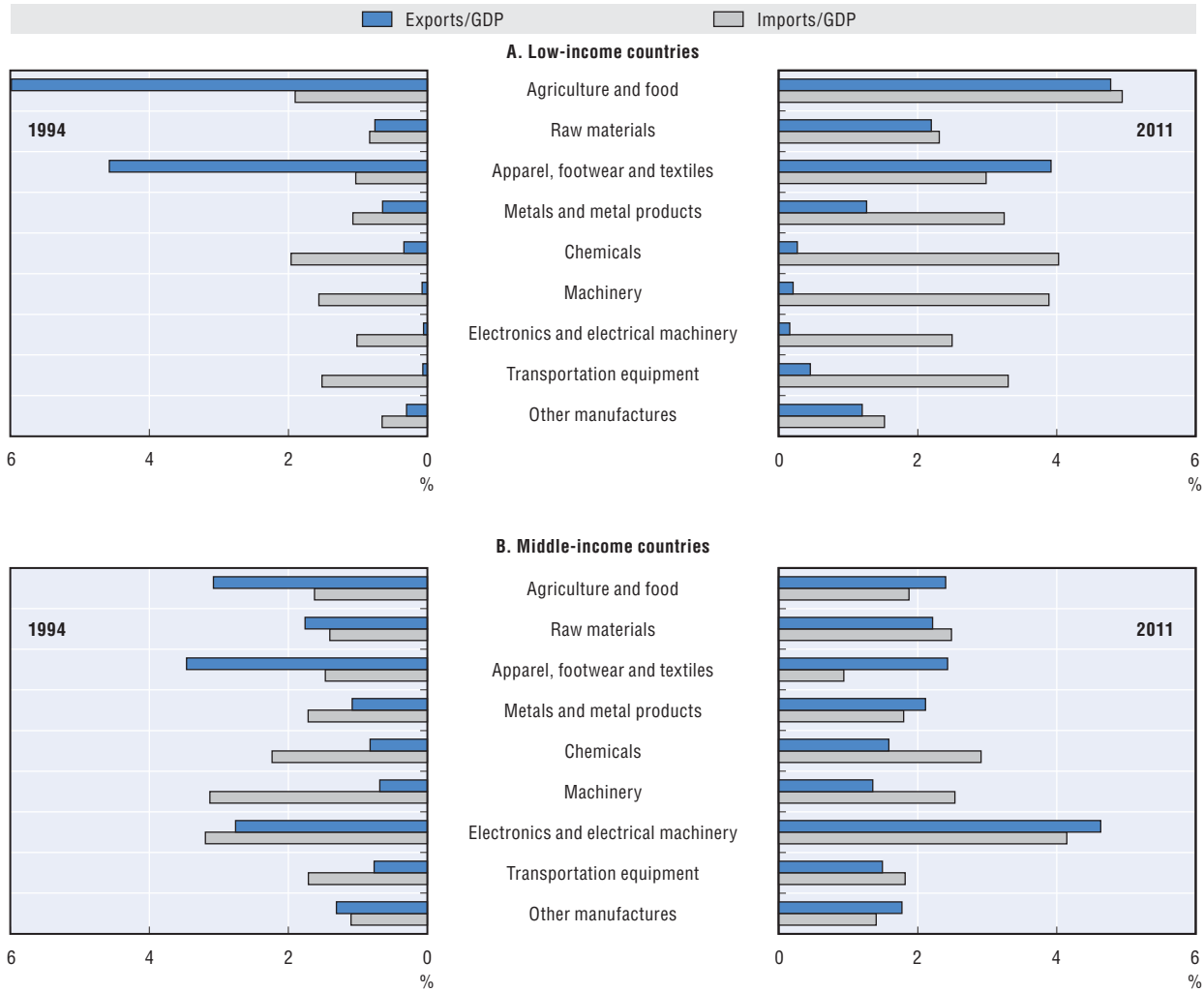
Two characteristics of global trade have become apparent over the last two decades (Hanson, 2012):

- The share of trade in GDP has grown sharply for low and middle-income countries as growth in trade advanced even more rapidly than their relative economic size: exports as a share of GDP rose from a quarter to more than 40% of non-OECD GDP during 1994-2008.
- The shifting pattern of global trade has involved much larger South-South (and North-South) trade flows. Between 1994 and 2011, the component of low and middle-income countries' exports to other low and middle-income countries rose from 18% to 32% of their total exports; the component of low and middle-income countries' imports from other low and middle-income countries rose from 17% to 38% of their total imports during the same period.

The growth in trade from developing economies has been associated with reduced trade and transport costs, World Trade Organization (WTO) membership and unilateral trade reform. An important explanation of why South-South commerce has surged over the last decades is expanding multi-stage global production networks (Hanson, 2012). Much of the recent increase in trade appears to be the result of off-shoring, with manufacturing fragmented across borders as firms have exploited comparative cost advantages.[4] Apart from the falling trade costs and expanding global production networks that are driving global trade, the greater role of emerging economies has contributed to a much finer degree of international specialisation than occurred previously when North-North trade predominated. This underlines the return of comparative advantage in connection with shifting wealth (Hanson, 2012): low-income countries have relatively large (net) exports in resource or labour-intensive sectors (e.g. agriculture, raw materials, apparel and shoes) and have accentuated during the past decades their import surpluses

in other sectors (Figure 1.9A). At the same time, a number of middle-income countries, in particular the large ones, have turned into net exporters of electronics, decreased net exports in the primary sectors and remained net importers in capital-intensive sectors (Figure 1.9B).

Figure 1.9. **Sector trade shares**



Source: Authors' calculations based on UNcomtrade (2012), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx* and Hanson, G.H. (2012), "The Rise of Middle Kingdoms: Emerging Economies in Global Trade", *Journal of Economic Perspectives*, American Economic Association, Vol. 26(2), pages 41-64, Spring.

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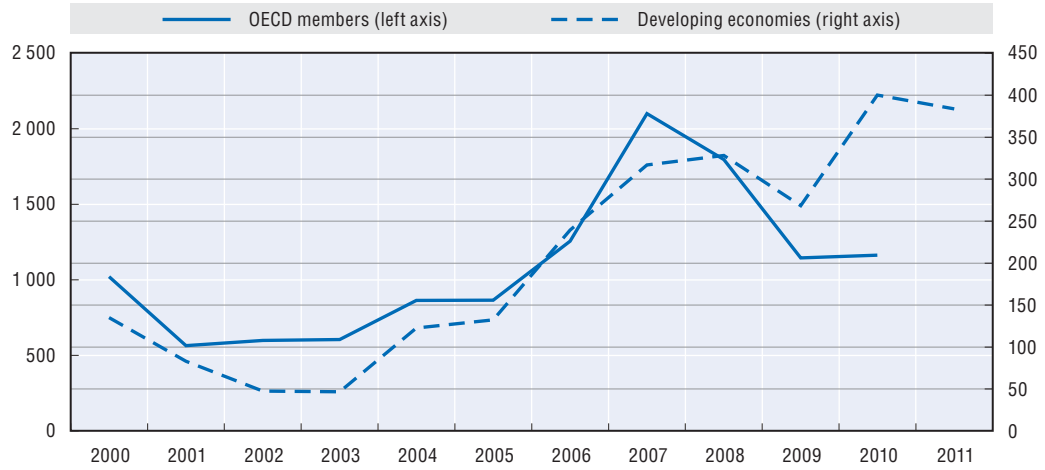
FDI has been a crucial vehicle in building global production networks and has usually flowed in a predominantly North-South direction; indeed, FDI sourced by OECD countries and hosted by developing countries surged during the 2000s (Figure 1.10). Like trade, FDI flows have also been growing faster than global GDP, and hence rising as a fraction of it. However, while these are by now well documented facts, the rise of outward FDI by emerging economies has been less appreciated. Outflows of FDI as a share of GDP rose over the 1994-2008 period from 0.2% to 1% of GDP in middle-income countries, catching up smoothly with the 3.8% of GDP sourced from high-income countries in 2008.[5]

Figure 1.10. **Foreign direct investment inflows by region, 2000-11**

USD billion, current prices and exchange rates



Source: OECD (2012c), *Globalisation – Foreign Direct Investment Statistics* (database), *http://stats.oecd.org/* and UNCTAD (2012), *UnctadStat* (database), *http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx*.

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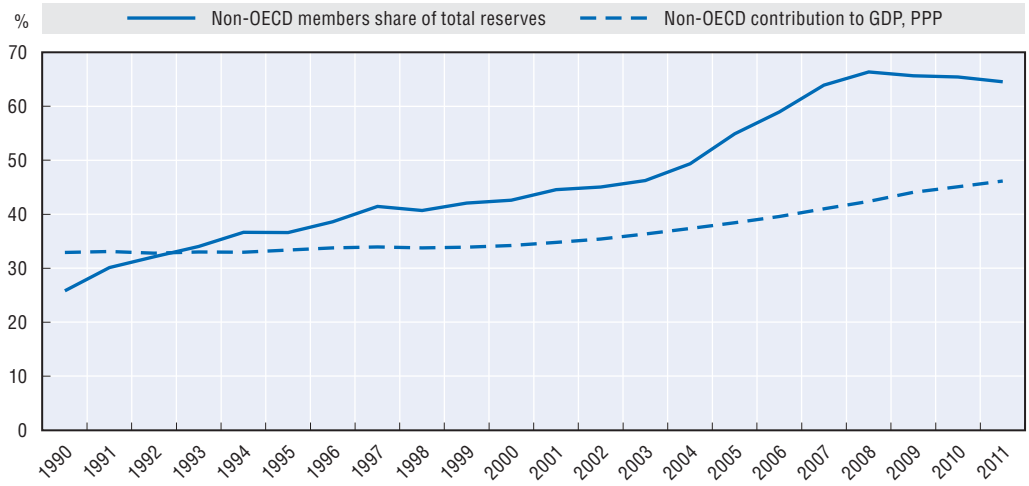
Developing countries are already the source of much of the world's savings and could become a growing source of FDI in other developing countries. They hold a cumulative USD 1.8 trillion in FDI abroad, with USD 850 billion from Brazil, China, India and the Russian Federation alone (Kharas and Rogerson, 2012). At present, most of these savings (*via* sovereign wealth funds and foreign exchange reserves) are flowing into advanced and upper middle-income countries. However, the balance of opportunities will gradually shift in line with risk-adjusted returns, which over the longer horizon favour countries with faster growth and a more slowly ageing population.

Apart from the stock and flow definitions of shifting wealth, its geopolitical dimensions have moved to the forefront (OECD, 2010). The reinvigoration of the G20 (which had been created in the aftermath of the 1990s Asian financial crisis) as the premier global economic policy forum; the modernisation of the inclusion, representation and voice of countries in international organisations (such as the Bretton Woods institutions); and the enhanced political weight, in particular of the large emerging economies, are observed features of their shifting geopolitical stance on a global scale. For international monetary governance, there is a growing prospect of the RMB, and perhaps other emerging-country currencies, entering reserve-currency functions alongside key OECD currencies (Reisen, 2009). In global trade policy, shifting wealth translates into higher bargaining power. Finally, the growing importance of non-OECD countries may translate into acceptance of a different intellectual paradigm underlying cross-border collective arrangements and lower effective compliance with standards as defined and scripted by the advanced economies, not least in the global aid architecture (Mahbubani, 2008).

New investment patterns change political balances. It can be observed that many newly cash-rich countries have different political regimes from the countries that previously dominated international investment (Röller and Véron, 2008). Figure 1.11 illustrates that non-OECD economies, in addition to encompassing a growing share of world GDP, have added to their future investment pool by generating current account surpluses.

Figure 1.11. **The shifting distribution of global economic power, 1990-2011**



Source: Authors' calculations based on World Bank (2012a), *World Development Indicators* (database), *http://data.worldbank.org/indicator*; Röller, L.H. and N. Véron (2008), "Safe and Sound: An EU Approach to Sovereign Investment", *Brueghel Policy Brief*, Issue 2008/8, Brussels, November.

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Shifting wealth is changing in nature and represents an evolving opportunity

The shifting wealth process, triggered by the rise of emerging economies, has created increasing development opportunities. Globally, the impact has been positive for developing economies, in terms of growth and poverty reduction, despite the fact that some countries have been hurt by increased competition, in particular from China. The rebalancing of China and other large emerging economies would have large impacts and would offer evolving development opportunities.

Shifting wealth has fostered global development and has been globally an opportunity, rather than a risk

Beyond China and the emerging giants, increasing South-South linkages have created opportunities for trade, financial flows and knowledge exchanges. For instance, China has become a major trade partner not only for developed and other Asian economies, but also for Latin America and Africa, shifting the world trade axis to the East. More generally, South-South trade linkages have intensified over the last two decades thanks to the widening differentials between developing and developed economies and the upsurge in intra-regional specialisation and production sharing. While world trade expanded almost fourfold, South-South trade multiplied more than ten times. In 2011 developing countries accounted for around 41% of global trade, with South-South flows making up about half of the total. As another example, emerging economies are increasingly both recipients of FDI and outward investors. They absorbed more than half of global FDI inflows in 2010, versus less than 20% in 2000, and half of the top 20 host economies for FDI in 2010 were emerging economies. FDI outflows from emerging economies also account for 29% of global FDI outflows (United Nations Conference on Trade and Development [UNCTAD] 2011).

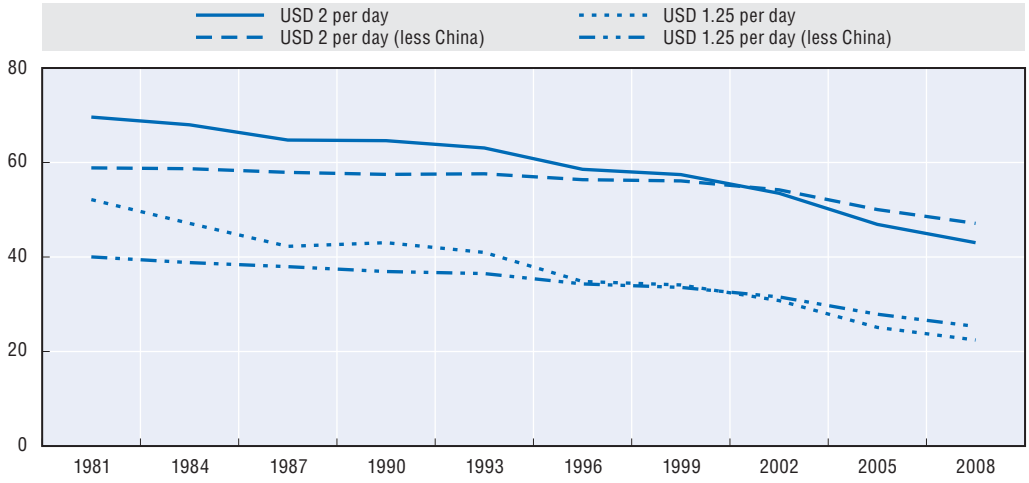
In spite of many assertions to the contrary, the positive growth performance of low and middle-income countries in the 2000s can be linked to a large extent to China's growth; in other words, recent developing and emerging-country growth has to a certain extent been linked to China's growth. Evidence suggests that poor countries, with or without oil

resources, have been changing their engine of growth during the 2000s, from the G7 countries to China (see for instance Garroway et al., 2012).[6]

The rising prosperity in many parts of the developing world has represented an enormous opportunity in terms of poverty reduction. It is the case that GDP growth in itself is not of much help if it fails to bring down poverty (Figure 1.12). While the proportion of the extreme poor (who have to live on less than USD 1.25 per day per capita) went down from 52% to 22% during the period 1981-2008, the number of people living on less than USD 2 a day per capita only started to decline from the 2000s, in the era of shifting wealth. During the period 1981-2008, the number of people living in extreme poverty declined by 650 million to 1.29 billion, despite a rise in the world population of more than 2 billion over the three decades. Most of that global poverty reduction occurred in China where the number of extreme poor diminished by half a billion. But Figure 1.12 clearly shows that, even correcting for China, the eradication of extreme (and less extreme) poverty has gathered speed during the last decade. Taking into account the evidence on growth links discussed above, it is fair to say that China has helped reduce not only local but also global poverty.

Figure 1.12. **Poverty rates for the developing world, 1981-2008**

Poverty headcount index (percentage below poverty line)



Source: World Bank (2012b), *PovcalNet* (database), *http://iresearch.worldbank.org/PovcalNet/index.htm*.

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Focusing on trade channels, Chapter 2 documents in detail the thesis that shifting wealth is more of an opportunity than a challenge. The 2011 edition of the *African Economic Outlook* (AEO, 2011) also shows that economic co-operation between Africa and non-OECD partners involves more than China alone and increasingly more than a simple quest for commodities. Indeed, while the rise of Africa's "emerging partners" has been widely analysed in terms of a scramble for African resources, there has been in the 2000s a remarkable rise of manufactured exports from sub-Saharan Africa to China and other emerging economies, as well as of FDI from emerging economies that has reached Africa's non-oil countries (which was, in proportion to their respective GDP, not less than FDI that reached oil and raw material producers); in contrast, OECD-country imports from Africa remain as biased towards oil, as do the FDI flows from OECD to Africa.

Emerging partners, not only China, seem also to focus more on infrastructure and other structural bottlenecks to growth. Apart from trade, new partners boost new sectors and finance mechanisms. China, India and Brazil in particular offer alternative modalities to finance development. These emerging actors blur the borders traditionally drawn between investment and aid; between trade and aid; and between private and public sector involvement (Dahman Saidi and Wolf, 2011). Their diversity is an opportunity for Africa, as they offer broader sources of finance; more appropriate expertise, technology and training; low-cost and speedy infrastructure; and cheap generics, machinery, and consumer goods. China has a perceived comparative advantage in building infrastructure, India in providing cheap generics as well as skills and services, and Brazil in helping agriculture and agro-processing. Emerging economies offer new opportunities to Africa, and that is how they are mostly perceived, according to a stakeholder survey of policy makers and experts in 40 of the 51 countries covered by the AEO. Such evidence contrasts with the views of some economists who have described the other poor countries as "emerging market victims" of China's exchange rate policy (see for instance Subramanian, 2010), or who argue that "China's currency policies undermine those regions' fundamental growth engines" (see for instance Rodrik, 2010). A number of economists are indeed concerned that countries in sub-Saharan Africa in particular have been propelled forward merely by the growing demand for their natural resources from other countries – especially from China, but detrimentally to their competitiveness.

From shifting wealth I to shifting wealth II

More than 30 years after the integration of the Asian giants into the world economy started, it is imperative to disentangle the effects of the initial entry of China and India into world markets (shifting wealth I) from the development effects on low-income countries that would arise should they be able to sustain their superior growth (shifting wealth II). The major channels through which development effects have operated have been global commodity markets and intra-Asian manufacturing production networks; the associated trade and investment volumes; and the indirect income effects arising from changes in relative prices (terms of trade and relative wages). Global second-order effects have been generated through the recycling of China's current account surplus and through the associated exchange rate and interest rate effects. It is safe to assume that shifting wealth II will accompany a rebalanced China that produces more sophisticated goods and consumes more than in the recent past.

Shifting wealth I encompassed the initial opening of China and India to world markets which really became felt from the 1990s – a "one-off" event that integrated 2 billion people, or 40% of the global labour force, into the global market economy. China's economic openness and manufacturing base created international trade, production and investment networks, especially with Asia, while its commodity-intensive growth created a "China-commodities complex", especially with Africa, Latin America and some OECD commodity exporters. The impact on developing countries was much deeper than is just indicated by actual trade flows, as higher commodity prices also created very large terms of trade gains and real currency appreciations even for countries with relatively small China orientation in their exports.

The opening of China and India to trade increased the proportion of workers with basic education in the world labour force and lowered the world average land/labour ratio. The relative endowments of other countries were thus shifted in the opposite direction, which tended to move their comparative advantage away from labour-intensive manufacturing (Wood and Mayer, 2012). The initial entry of China into world markets,

especially after it joined the WTO, has been supportive of raw material prices relative to manufactures, especially manufactures that embody basic skills only (Jankowska et al., 2012). Resource-based economies, reaping the benefits of rapidly expanding demand in China for their commodity exports, may at the same time also be cursed by appreciating exchange rates, rising labour costs, loss of competitiveness in manufacturing industries and other challenges brought about by the commodities boom. The biggest gains in real effective exchange rates during the 2000s (2000-11) indeed occurred in those countries that have benefited most from China, if not through direct trade links then through gains in their terms of trade (for instance Chile, Colombia, Nigeria or Peru).

The counterpart to rising materials prices were drops in the price for basic-skill manufactures, a result of the Stolper-Samuelson effect[7] of more than 2 billion people with basic skills being simultaneously integrated into the world economy, which has implied challenges, but also opportunities. China's competitive threat, in particular, led to widespread concerns that China would deindustrialise other developing countries, concerns that were confirmed in some semi-industrialised countries such as Mexico, Thailand and South Africa while the majority of low and middle-income enjoyed higher growth thanks to China's growth engine.[8] However, crowding out by China is difficult to disentangle from the limited capacity of some middle-income countries, often in Latin America, to engage in a structural transformation conducive to higher productivity. By contrast, emerging Asia offers a few examples of virtuous productive transformations. These are in part linked with the development of Asian manufacturing production chains, closely tied to Asia's high and rising intra-regional trade, as manufacturing activities shifted downstream from the more developed East Asian countries. Japan, Chinese Taipei and Korea were the big drivers of this delocalisation of manufacturing. Meanwhile, China is at the heart of Asia's intra-regional trade, with an estimated 56% of Asia's exports to China in 2011 being used for processing for re-export to other markets, and the rest for final demand in China (Citigroup, 2012).

Overall, the impact of China on developing-country growth performance has been positive, regardless of the country dimension. Both low-income and middle-income countries have benefited, as have (as was to be expected) oil and commodity producers but also non-oil countries (see Table 1.1). While the China-commodity complex easily explains the positive growth connection for countries endowed with raw materials, it can be presumed that Asia's intra-regional value-chain trade has produced the positive results for the non-oil countries.

Table 1.1. **The developing world's growing China linkage**

Change in growth rate associated with 1% change in China's growth rate

	Low-income countries	Middle-income countries	Non-oil countries	Commodity countries
Before 2000	-0.26[1]	+0.02	+0.22[1]	-0.30[1]
After 2000	+0.60[1]	+0.64[1]	+0.42[1]	+0.94
Total	+0.34[1]	+0.66[1]	+0.66[1]	+0.64[1]

Notes: The impact of China's growth on these four country groups has been quantified using a fixed-effects model, which allows analysis of a cross-section of developing countries over time.

1. Denotes 99% significance.

Source: Garroway et al. (2012), "The Renminbi and Poor-country Growth", *World Economy,* 35: pp. 273-294.

Shifting wealth II refers to a long-term process of sustained and higher growth in heavily populated emerging economies if they keep accumulating skills, capital and modern technology, build a middle-income class, switch (in the case of China in particular) from investment-led growth toward more consumption, and export increasingly sophisticated goods and services. If emerging economies succeed in becoming advanced economies, their success would improve export opportunities for the remaining developing countries, which can lead to accelerating global growth. If countries get richer, they will experience a demographic transition with a drop in fertility and young age dependence. If differentials of population growth between developing and advanced economies are small, economic development accelerates over time. Both migrants' remittances and aid from rich to poor countries can support this process. If China and India become richer and if their poor share the new wealth, over 2 billion more people will live in countries that import labour-intensive goods and fewer in countries that export them, opening up opportunities for other countries to fill this niche. Their initial opening (of China in particular) may have hurt developing countries in the short term, but their sustained growth would improve the long-term prospects of low-income developing countries (Chamon and Kremer, 2009).

The trade patterns of rapidly growing countries tend to be quite dynamic. If factors are being accumulated at differential rates, the composition of output can change quite quickly. The Rybczynski theorem[9] suggests that, given rapidly growing education and production skills in China, its skill-intensive output should rise more than disproportionately (see also Woo, 2012). Unlike low-income countries that no longer compete directly with China, advanced and middle-income manufacturing exporters compete directly with China in manufacturing exports. China's average export prices (unit values) place substantial downward pressure on these countries' prices; by contrast, there is little and vanishing evidence for price competition between China and low-income countries. The price competition effect of China's exports over low-income countries in the United States, the European Union (EU) and Japanese markets weakened over the period 1989-2006 (Fu et al., 2012), suggesting a gradual change, for low-income countries, in Chinese competition from price to non-price factors such as quality and variety.

If China continues to converge towards high-income economy per capita income levels, either higher real wages or real appreciation of the Chinese currency will continue to speed up China's structural upgrading, which would further soften the price pressures on low-skilled goods and on low-income countries. At the same time, technological upgrading in China would move its price impact from the middle-income countries to the high-income economies. Prosperity in China and other large emerging economies will improve export opportunities for the remaining developing countries, which can lead to accelerating global growth, supported by a demographic transition with a drop in fertility and young age dependence (see Chamon and Kremer 2009). Table 1.2 summarises some possible global development effects of moving from shifting wealth I to shifting wealth II.

While the growth engine shifted from the G7 countries to China during shifting wealth I, global rebalancing in the light of a lower trade surplus in China and a move from investment-driven toward consumption-driven growth should imply a partial rebalancing of the growth engine for developing countries – back toward OECD countries and more toward middle-income countries other than China. This should foster diversity of trade partners for poor countries and attenuate hyper-specialisation effects witnessed during shifting wealth I. The shift from investment-led toward consumption-led growth will

Table 1.2. **The global development impact: From initial entry to sustained growth effects**

Impact channel	SW I: Entry effects	SW I: Impact on LICs + MICs	SW II: On-going process	SW II: Impact on LICs + MICs
Growth engine	From G7 to China	Higher growth in LIC and MIC, oil and non-oil	Partial rebalancing of growth engine	Higher trade client diversity, while initial specialisation effects weaken
Aggregate demand	Investment-led	Stimulated imports of commodities and skill-intensive	Higher consumption share, less investment[1]	Stimulates low-skill imports, skill imports neutral, structural impact on commodity demand (iron ore, copper suffer; food crop prices stagnant/rising)
Factor supply	Land-labour ratio lower; Skills-labour ratio lower	Better ToT for commodities and skill-intensive Lower ToT for low-skill manufactures	Skills-labour ratio gradually rising Land-labour ratio stagnant	Better ToT for low-skill manufactures with new supply/demand balance Skill- and tech-intensive manufactures face lower ToTs

Notes: SW: Shifting Wealth. ToT: Terms of trade. LIC: Low-income countries. MIC: Middle-income countries.
1. This does not take into account the possible acceleration in urbanisation trends in other developing countries, which would require investment in those countries.

impact on raw material prices, with prices for industrial metals (steel, copper, zinc) slowing as the pace of the first phase of urbanisation and industrialisation in China decreases. The winners from this transformation will be those commodities (such as palladium and coffee) with strong links to rising living standards and changing tastes, or to the industrial sectors that will outperform, such as vehicles, renewable energy or power investment (Barclays, 2012). The skills-labour ratio is projected to rise gradually as China approaches the Lewis turning point (Huang and Jiang, 2010), with wage pressure starting to translate into higher prices for basic-skills goods while the evolving supply-demand balance will exert price pressures on skill-intensive and technology-intensive goods.

Another lasting growth driver will be fast-rising emerging-country "middle-class" consumption (Kharas, 2010). Burgeoning "middle classes" in dynamic developing countries will by 2025 dominate global demand for most goods and services. Using a metric of USD 10-USD 100 per day in PPP terms, the developing country share of global "middle classes" of just under 4 billion people in 2025 (compared with 2 billion today) is projected to increase from 55% to 78%, and its spending share from 35% to 60% (see Table 1.3). The world's consumption centre of gravity is rapidly shifting to the East. By 2025 it will be over central India, with strong pulls from Southeast Asia, as well as from China and India itself. Favourable demographic trends (outside China) push developing countries to grow faster than developed countries as they are still at an early phase in their demographic transition. Global demographic trends are inexorably changing the distribution of global economic activity. The reason for expecting an acceleration of global growth is that the share of rapidly growing economies has now risen to almost half of total output, while the share of slow-growing countries has fallen.[10] India, although poorer than China, has a sizeable "middle class" that could overtake China's by 2020 (Kharas, 2010), even though India would still be much poorer than China at that time. India has a much higher share of household income in GDP, so its "middle class" is larger given its income level. As India has the potential to grow rapidly for some years to come, its emerging "middle class" will strengthen and reinforce its growth.

A weaker and more consumer-driven growth in China, linked to the rebalancing process, will imply structural changes to be felt in middle-income countries

Table 1.3. **Spending by the global "middle classes", 2010-25**

World total and shares as percentage of world total

	2010	2025
World total, USD trillion, PPP adjusted	21.9	40.2
Shares as % of world total		
North America and Europe	64	41
Asia Pacific	24	45
Central and South America	8	8
Middle East and North Africa	3	3
Sub-Saharan Africa	1	1

Source: Kharas, H. (2010), "The Emerging Middle Class in Developing Countries", *OECD Development Centre Working Paper,* No. 285, OECD Publishing, Paris, January; updated in Kharas, H. and A. Rogerson (2012), *Horizon 2025: Creative Destruction in the Aid Industry*, Overseas Development Institute, London, July.

(Citigroup, 2012). The shrinking share of investment in China's GDP and the rising "middle classes" in emerging economies will favour goods and services with high income elasticities, such as tourism, cars and green energy (Engel's Law shows that the absolute spending on goods with low-income elasticity does not need to fall, just their share in overall spending). The new demand patterns will in turn determine the future price developments of commodities: aluminium and palladium, heavily used in cars and power infrastructure, would fare better than copper, iron ore and zinc, the metals most leveraged to construction and fixed asset investment. The cyclical dependence – the elasticity of demand to real GDP growth, hence by extension China's GDP growth – has been highest for metals such as aluminium, copper, nickel, zinc, iron and tin. Big metal exporters to China such as Zambia and Chile may suffer from weaker imports and lower prices arising from a satiation of the investment-led urbanisation and industrialisation process in China.[11]

After 15 years, during which China has shifted from being a supplier of parts and components to developed countries to becoming the core production base for suppliers in other countries,[12] it is reasonable to expect relative, if not absolute, factor relocation away from China, as its manufacturing wage cost advantage is gradually eroding because of higher real effective exchange rates (through either wage inflation, nominal currency appreciation or a combination) and as other factor inputs – real estate, capital, water and energy – become more expensive as well. Which countries might benefit? The Citigroup (2012) analysis relates the World Bank's 2012 *Logistics Performance Index* to manufacturing unit labour costs relative to China. According to its analysis, India, Indonesia, Malaysia, the Philippines, Thailand and Viet Nam are well placed to capture a slice of the fragmented production networks that may leave China. As other developing regions perform worse, Asian regional integration is predicted to intensify further in manufactures.

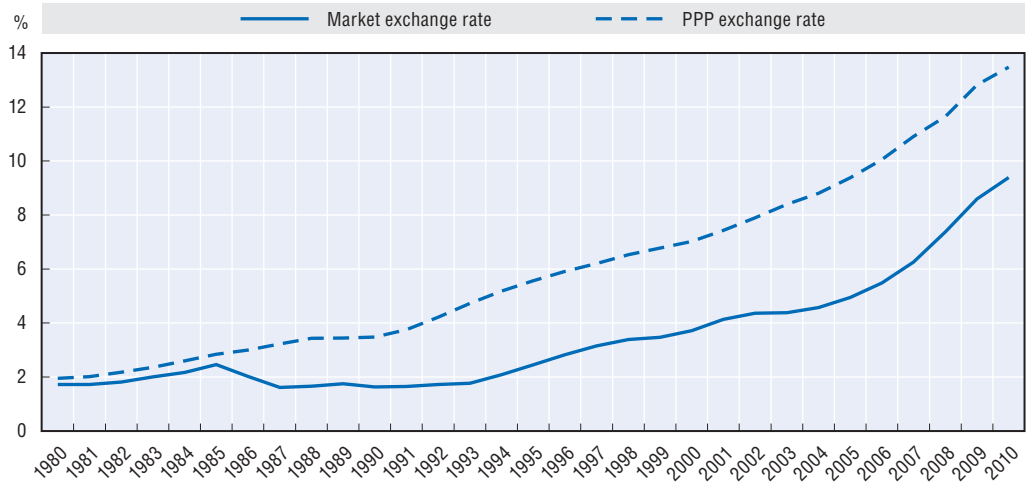
Is shifting wealth sustainable or has it just been a temporary phenomenon linked to the first decade of the 21st century?

Since the OECD is expected to remain at low or moderate levels of growth in the foreseeable future, the answer to that question hinges on whether China continues to outperform in terms of growth or, in the event that it does not, whether other heavily populated middle-income countries would take the lead. The rise of the non-OECD economies as a percentage share of world GDP (displayed in Figure 1.7), regardless of whether it is measured in purchasing-power adjusted terms or at market exchange rates,

has been largely due so far to China (Figure 1.13). That is why the world's economic centre of gravity has shifted East (Quah, 2011) and so far, even a large, fast-growing economy such as India has played a much more minor role than China (Figure 1.14). The world's economic centre of gravity can only move south if China (currently 19.2% of world population) is emulated by populous countries such as India (17.3%), Indonesia (3.4%), Brazil (2.7%), Pakistan (2.6%), Nigeria (2.3%) and Bangladesh (2.0%).

Figure 1.13. **China's share of world GDP, 1980-2010**

At market and PPP exchange rates



Source: IMF (2011), *World Economic Outlook, 2011*, International Monetary Fund, Washington DC.

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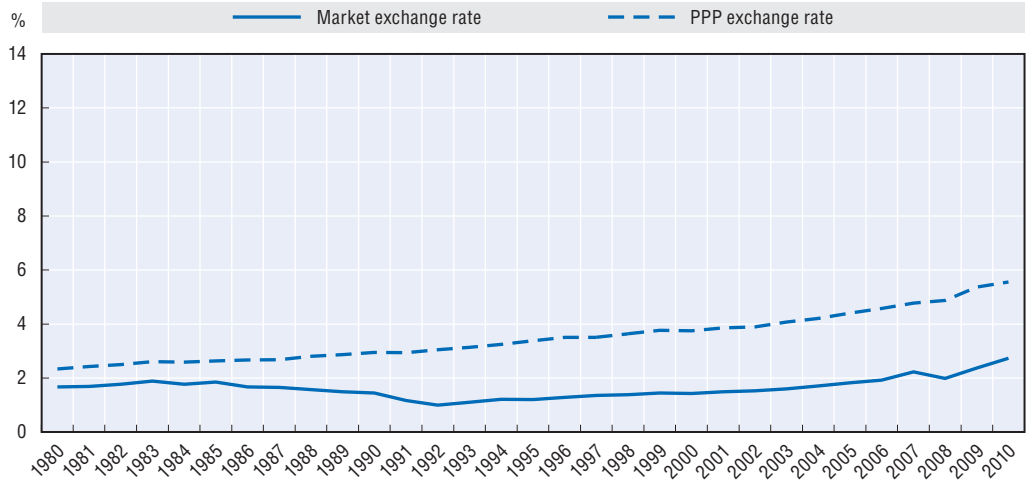
Figure 1.14. **India's share of world GDP, 1980-2010**

At market and PPP exchange rates



Source: IMF (2011), *World Economic Outlook, 2011*, International Monetary Fund, Washington DC.

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Mainstream economic theories, perhaps because they tend to underweight the positive network externalities of the higher capital stocks that have built productive sectors in Asia, have had a hard time in explaining Asia's outstanding performance, and

called it accordingly "the Asian miracle". Consequently its end has been constantly announced. While the past 30 years have seen many negative forecasts about China's growth that subsequently remained unsubstantiated,[13] four economic, social or environmental[14] challenges to sustained growth in China and other leading emerging economies stand out.

A first concern is China's rebalancing from investment-led to consumption-driven growth, with an associated decline in its trade surplus. The ability of China and other Asian economies to pursue their growth strategy might be increasingly circumscribed by the refusal of other economies (emerging and developed) to run ever increasing trade deficits with Asia (Rodrik, 2011a). Furthermore, global imbalances may introduce negative externalities, by depressing interest rates too much and stimulating asset bubbles (*Aizenman, 2009*; Levy Yeyati, 2010). The fear is that a decade of stable growth in China and other emerging economies might give way to a period of volatile boom-bust cycles. Both Japan in the 1970s and Korea in the 1990s provide historical antecedents.

A second important concern centres on what has recently been called the middle-income trap. Specifically, rapid growth in emerging economies might slow down and they will be trapped at middle-income level. This occurred in the past in many Arab and Latin American countries, and also recently in Malaysia and Thailand. Recent evidence suggests that rapidly growing economies slow down significantly when their per capita incomes reach around USD 17 000 in 2005-constant PPP prices (Eichengreen et al., 2011). At this income level, growth rates have been found to decrease by at least 2 percentage points. China is set to achieve this income level by 2015 or soon after. Beyond concerns of a supposedly overly heavy remaining dependence on slowing OECD activity, the factors that have massively contributed to high growth in emerging economies may weaken (e.g. the rural-urban divide, the population dividend, or the catching up to their technological frontier). Indeed, growth in a number of converging economies was mostly based on Gerschenkron and Lewis-type growth, i.e. factor accumulation and dual sector shifts (large supply of subsistence labour, capital deepening, dual-sector reallocation). Such growth patterns may be getting closer to an end where higher efficiency, upgraded skills and a diversified non-traditional output mix would be prevalent.

Third, growing social challenges are associated with rising income inequalities, as well as with the need to meet the rising expectations of citizens in terms of standards of living and of access to opportunity (OECD, 2012a). Deep and fast economic transformation often worsens inequalities, social exclusion and tensions. While absolute poverty (e.g. share of the population below USD 1.25 PPP/day) has fallen in many emerging economies in recent decades, the number of relatively poor has often stagnated or increased.[15] Thus, while the absolute living standards of the poor may have improved, the number of people who are affected by relative poverty has grown over the last two decades. The growing relative poverty raises a number of concerns, and in particular for stability. Indeed, in fast-growing economies, citizens typically raise their expectations regarding current and future standards of living as they aspire to share the benefits of growth. It is risky for governments to disregard the expectations of their emerging "middle classes" or to underestimate their capacity to mobilise and to 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 often fail to reach a significant part of them, since these systems are not yet sufficiently developed, or since workers often remain in the informal sector. This leaves them at a high risk of significant downward

social mobility when they get sick, lose their job, or retire. These uncertainties may also affect the level of domestic demand, and hence prospects of growth.

Fourth, environmental challenges are also looming larger. Continued degradation of the environment poses risk of irreversible damage that jeopardises the continued rise of living standards. There is a growing recognition amongst policy makers that some of the hitherto successful development strategies may not be sustainable in the longer run (e.g. the ASEAN export-led, energy-intensive model of growth, see OECD, 2011). Hence, attention is increasingly turning to evolving new development strategies that would spur the environmental sustainability of growth.

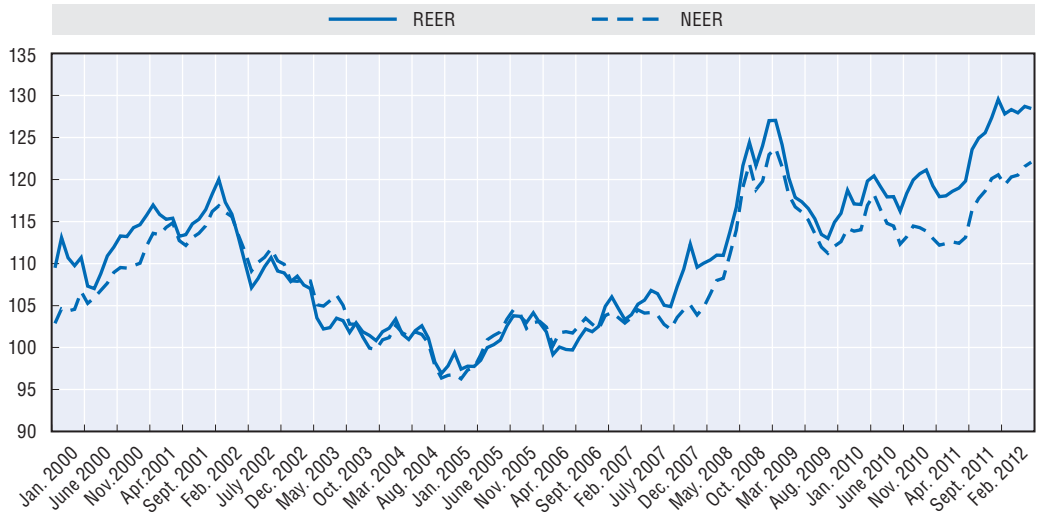
The first two, economic, concerns need to be considered more closely.[16] China's current account surplus over the past two decades can be well explained by structural savings determinants. In particular, the role of rising corporate savings arising from reallocation within the manufacturing sector from low to high-productivity companies has been stressed (see for instance Song et al., 2011). China's rising household savings can also be explained by gender imbalances (Wei, 2010). Household and corporate savings have financed, beyond external investments, an investment/GDP ratio that reached 50%. Such extreme levels of capital accumulation are bound to disappear as a result of the decline in the efficiency of China's investment spending, the fall in the return on capital and the changing dynamics of China's labour market as wages rise and corporate profitability drops. The growing domestic consumption of a rapidly growing "middle class" (on which more below) and policy reforms in areas such as interest liberalisation, price reform and pension reform will be associated with rising disposable income of Chinese households and lower incentives to save.

Moreover, large currency appreciations do impact on the current account (hence can allow a decrease in China's current account surplus) and, in developing countries, can at the same time slightly depress growth, as evidenced by data over the past 50 years (Kappler et al., 2012). In fact, China's trade surplus peaked in March 2009 and has since fallen substantially, even more so as a percentage of China's growing GDP. The rebalancing was also driven by a recent appreciation of China's trade-weighted exchange rate, especially if corrected for inflation differentials with China's trade partners (Figure 1.15). Mostly thanks to positive inflation differentials with its trade partners, China's currency has appreciated by 18% compared with its trade partners[17] since 2008.

The increase in the world's China-dependence in the past few years suggests that the continuing rebalancing of the Chinese economy will have highly visible consequences for many developing and emerging economies. The threat from a slower-growing, more consumer-driven China will depend largely on whether the rebalancing process is benign (more consumption) or not (less investment). A less benign rebalancing would certainly accompany weaker Chinese growth, and this could contain a number of threats for emerging markets in particular. Potential challenges come in three forms: *i)* threats to the commodities exporters who fail to benefit from the weaker growth of China's commodities demand and its changing composition; *ii)* threats to countries who lose out in China's pursuit of vertical integration, by which China replaces foreign-supplied inputs to the production process with its own; and *iii)* threats to a broader group of commodity-importing countries if it turns out that a weaker, more balanced Chinese growth has a negative impact on global risk appetite that subsequently reverses the endogenous favourable debt and macrodynamics in those countries (Citigroup, 2012).

Figure 1.15. **Chinese renminbi effective exchange rate index, 2000-12**

2005 = 100



Notes: An increase means an appreciation.
NEER (nominal effective exchange rates) and REER (real effective exchange rates) are based on broad Bank of International Settlements (*BIS*) *effective exchange rate indices*, comprising trade weights with 58 economies.
Source: BIS (2012), *Bank of International Settlements Effective Exchange Rate Indices* (database), *www.bis.org/statistics/eer/index.htm*.

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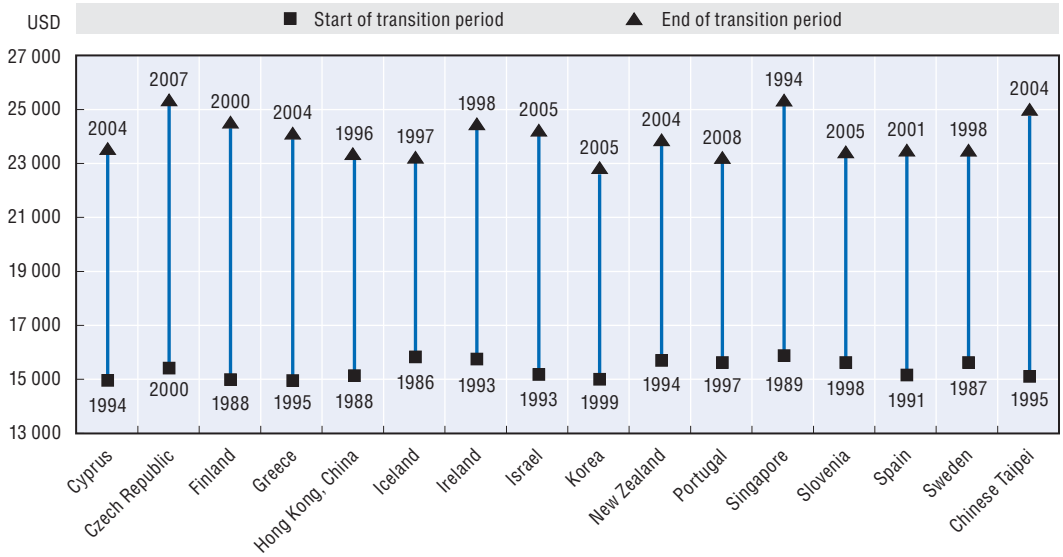
The other important non-cyclical concern is that China's growth falls as it is caught in the middle-income trap, and with it other emerging middle-income countries whose growth has been increasingly China-dependent in the last decade. A look at the data, however, would seem to suggest that escaping the middle-income trap has not been uncommon recently. Figure 1.16 produces evidence for all advanced countries (in the International Monetary Fund [IMF] World Economic Outlook [WEO] 2011 definition) that have changed from middle-income to advanced-country status since 1980. The transition threshold is defined as in Foxley and Sossdorf (2011): countries with a per capita income in terms of PPP (purchasing power parity) below USD 15 000 in 1980 that reach a per capita income of the last country placed in that category by the IMF, namely Portugal, with a per capita income of USD 23 000 in 2008. The table has 16 economies that found ways around the middle-income trap over the last 30 years, none of them in Latin America or the Middle East. Most of the countries are European and/or are (now) OECD members. The transition period and the transition speed have varied considerably among the 16 countries, from 5 years to 11, and from 3.6% to 9.5% a year. The IMF estimates China will enter the transition threshold of around USD 15 000 PPP per capita by 2015 or 2016. Despite the need to switch gradually to a new growth model, China has enough momentum to grow further, albeit at lower rates. The evidence presented in Figure 1.16 would imply that China will enter the group of advanced countries as defined by the IMF between 2020 and 2027.

Income convergence and emerging-country "middle classes" consumption are two important pillars for the recalibration of the world economy toward the East and the South for future decades. The relatively low level of per capita income in heavily populated countries such as China, India, Indonesia or Bangladesh and the rising "middle classes" in such countries give reason for optimism that the recalibration of the world economy will

Figure 1.16. **Transition from middle-income to advanced-economy levels**

Per capita income in terms of purchasing power parity (PPP)



Source: Reisen, H. (2011), "Ways round the middle-income trap", 7 November. Available from *http://shiftingwealth.blogspot.in/2011/11/ways-round-middle-income-trap.html*.

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continue for the foreseeable future. Despite its impressive long-run growth performance, China itself remains still at lower middle-income levels in the World Bank definition. And given the strong regional disparities within China, lower-income provinces may achieve the status of high-income provinces before the country would hit the middle-income barrier previously witnessed in other countries. The argument holds even more for India which, unlike China, will be supported for the next decades by a favourable demography, with lower young-age dependency and hence higher domestic savings that will allow high investment rates to be sustained.

A study by Citigroup has investigated the likely future sources of global economic growth between 2010 and 2050, and is optimistic for many developing and populated countries (Buiter and Rahbari, 2011). Aiming at identifying so-called global growth generators (3G), the study considers a weighted average of six growth drivers that the growth literature has found important. The six components are measures of *i)* domestic saving/investment; *ii)* demographic prospects; *iii)* health; *iv)* education; *v)* quality of institutions and governance; and *vi)* openness to trade and investment. Apart from China and India, the list of 3G countries includes Bangladesh, Egypt, Indonesia, Iraq, Mongolia, Nigeria, the Philippines, Sri Lanka, and Viet Nam.[18] Developing Asia and Africa are forecast to be the fastest-growing regions, essentially driven by a drop in young-age dependency (before old-age dependency turns to burden) and by beta-convergence. This optimism is however based on the authors' presumption that many emerging economies will have opened up to foreign trade and investment, and that they would have surpassed a critical threshold level of institutional quality and political stability.

The Citigroup report on the 3G, however, fails to address the question of why there are poverty traps in the first place that have hindered young and poor countries from catching up in the past, with the exception of the last ten years when exceptional global liquidity,

unsustainable global imbalances and China's growth lifted a majority of developing and emerging economies. Child labour, persistent high fertility, illiteracy, debt bondage, soil erosion, profitable criminality and conflict in resource-rich *rentier* economies are just some examples that define the vicious circle of sustained poverty. The lack of social cohesion and rising inequality in the emerging economies, often linked to exceptional growth in a dual-economy setting through Kuznets effects, will perhaps be the most important stumbling blocks for global growth generation. However, China and India accounting for almost 2.5 billion people between them, did manage to launch themselves on new and promising growth and development trajectories after centuries of poverty and stagnation.

In the same line, Johansson et al., (2012), build a model for projecting growth of OECD and major non-OECD economies over the next 50 years as well as imbalances that arise. Their growth scenarios are shaped by developments in education, technological progress and labour force participation based on a framework in which GDP per capita in each country is expected to converge to the long-run path that is assumed to be consistent with its own endowments, policies and institutions.

They find that global growth will be sustained by emerging economies, and that growth of the non-OECD G20 countries would continue to outpace OECD countries, although the difference would narrow over coming decades. As a result, the next 50 years will see major changes in the relative size of world economies. In particular, fast growth in China and India will make their combined GDP measured at 2005 Purchasing Power Parities (PPPs), soon surpass that of the G7 economies and exceed that of the entire current OECD membership by 2060, while it currently amounts to only one-third of it. Although there is no consensus regarding the relevant policies to implement, they also underline that efficiency improvements will be the main driver of growth and that there is a need for policies to make growth sustainable.

Conclusion

The magnitude and the features of this process may depend on what will happen in China and other large economies, as well as on the domestic policies which would be implemented. If China (and other major middle-income economies) avoid the middle-income trap and become richer, this may provide further opportunities for growth for poor countries. The rebalancing of China and the rise of Chinese consumption may provide opportunities for other developing economies to move up in the global value chain. Furthermore, if the structural constraints and challenges that low and middle-income countries face are to be addressed, they will be confronted with the need to implement deep reforms. This concerns in particular the need to adapt their productive network and to enhance the inclusiveness of growth. Economic development policies will be needed to support the sustained growth performance that low and middle-income countries have enjoyed over the past decade.

However, development economics and evidence have shown that not all policies are right at all moments in time for all countries. For instance, Aoki (2011) distinguishes five phases of economic development and institutional development (along which policy prescriptions can be clustered): Malthusian; government-led; *à la* Kuznets; human capital-based; and post-demographic transition. But there are also marked differences in the onset, duration and institutional forms of these phases across economies. Lin (2010) underlines a framework in which the stage of development of a country matters. Similarly,

the World Economic Forum (2012) raises the point that the drivers of growth depend on the stage of development of the country, with initially factor accumulation, then a focus on efficiency and productivity, and then a focus on innovation at a later stage. Acemoglu et al., (2006) underline that "distance to the frontier" matters for the selection of appropriate growth strategies: countries at early stages of development (optimally) pursue an investment-based strategy, which relies on existing firms and managers to maximise investment. Relatively backward economies may switch out of the investment-based strategy too soon, so certain policies such as limits on product market competition or investment subsidies, which encourage the investment-based strategy, may be beneficial.[19]

The global crisis that originated in the US has also led to scepticism and has prompted searches for alternatives to Western policy paradigms. Indeed, while income convergence post World War Two until the end of the 20th century had been conditional on OECD membership and broadly following OECD mainstream advice,[20] and while there was no income convergence outside the OECD area, the 21st century has, so far, witnessed much stronger income convergence outside than inside the OECD. Furthermore, Wölfl et al., (2010) estimate that the effects of a rapid liberalisation of product and labour markets, as well as of trade and foreign investment, can be significantly weaker below a certain income per capita threshold. Extending deregulation and liberalisation policies that have worked in rich OECD countries to emerging and developing countries must be done with great care, if sustainable growth is not to be impaired.

The global economic outlook, even though is not as optimistic as it was before the 2008 financial and economic crisis, opens opportunities for developing countries provided that they follow a strategic approach. Countries have to face a very uncertain landscape. The extent to which developing countries will be able to sustain growth and to transform it into a sustainable and inclusive growth will depend on their willingness and capacity to implement targeted policies.

The challenges that emerging and developing countries face today are increasingly complex and require integrated policy responses. Increasing knowledge content of production, diversifying and increasing exports and strengthening the scientific and technical base are key steps for developing countries to create jobs and sustain growth. Several countries are implementing industrial policies to achieve these objectives. The *Perspectives on Global Development 2013* analyses the role of these strategies in enabling the structural changes required to respond to these emerging challenges. It examines policy options which aim at facilitating an appropriate process of structural economic transformation and discusses the ability of countries to implement these policies. Before discussing the renewed role of industrial policies in the rapidly evolving globalised context, the report analyses the impact of China on other emerging and developing economies.

Notes

1. BBVA (2012) points out that China has become the world's largest creditor, while most other emerging economies remain net debtors so far, although their international investment position is expected to become less negative.
2. China remains the most important single foreign holder nation of US treasury securities. See for latest US data *http://www.treasury.gov/resource-center/data-chart-center/tic/Documents/mfh.txt*.

3. However, because of higher integration, the cyclical components of GDP of different groups of countries appear much more correlated than in previous decades, which means that shocks in advanced countries can have significant impacts on developing countries.
4. A consequence may be that gross trade flows (i.e. total exports) overstate net exports (corrected for intermediate imports), which might imply that some recent expansion of South-South trade, especially for manufactures, is merely a statistical artefact (see for instance Athukorala, 2011).
5. See also Chapter 2 for deeper analyses on China's outward FDI.
6. Their study looked at the relationship between China's growth rate and those of 115 developing and emerging economies for the period between 1990 and 2009. The analysis distinguished net exporters of oil and raw materials from net importers, and low-income from middle-income developing countries.
7. The Stolper-Samuelson theorem was developed in 1941 and states that, with constant returns, *perfect competition* and equality of the number of factors to the number of products, a rise in the *relative price* of a good will lead to a rise in the return to that factor which is used most intensively in the production of the good, and conversely, to a fall in the return to the other factor.
8. See, for example, Greenaway et al., (2008), Kaplinski and Morris (2008), Lederman et al., (2008).
9. The Rybczynski theorem was developed in 1955 and states that, at constant relative goods prices, a rise in the endowment of one factor leads to a more than proportional expansion of the output in the sector which uses that factor intensively, and an absolute decline of the output of the other good.
10. To be sure, there are many uncertainties surrounding this consumption-cum-demography scenario. Foremost is whether China's "middle class" will develop fast enough to sustain rapid growth in China if exports start to falter. Given China's unequal income distribution and the small current share of the "middle class", it is not at all certain that this will be the case.
11. This does not take into account other features, such as the possible acceleration of other large developing countries and its impact on world demand patterns. See also Chapter 2.
12. From which mostly ASEAN countries have benefited (OECD, 2013).
13. See Krugman (1994) as a famous example. It seems that the success of Asia's economies is considered out of line with mainstream economic theories. Krugman "predicted", among other things: "From the perspective of the year 2010, current projections of Asian supremacy … may well look as silly as 1960s-vintage forecasts of Soviet industrial supremacy did from the perspective of the Brezhnev years".
14. Political and institutional challenges to emerging-country growth, while they exist, are not discussed here.
15. The relative poverty measures define that basket or income level as a proportion of a given society's mean or median standard of living (consumption or income).
16. The chapter focuses on the two first, economic concerns. Social challenges were analysed in the previous edition of the *Perspectives on Global Development* (see OECD, 2012a). For environmental challenges, see for instance OECD (2011).
17. Compared with the estimated level of undervaluation of the renminbi, this appreciation is significant. For instance, the renminbi was also estimated to be undervalued by around 12% in 2007, relative to the Balassa-Samuelson benchmark that allows for differences in per capita incomes (Garroway et al., 2012). There are however other estimates, which result in higher estimates for the degree of undervaluation.
18. Note that some prominent emerging economies did not make it into Citigroup's 3G list: Brazil, Chile, Mexico, the Russian Federation, South Africa or Thailand.
19. However, these policies may have significant long-run costs because they make it more likely that a society will be trapped in the investment-based strategy and fail to converge to the world technology frontier.
20. See evidence and discussion provided by Bénassy-Quéré et al., (2010), Chapter 6.

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Chapter 2

Channels of shifting wealth

Shifting wealth – driven primarily by China's rise but also by the dynamism of some other developing countries – has been a major force behind reshaping global economic relations. To adopt the right strategies in this changing landscape, it is useful to understand the channels through which countries are affected. The impact of shifting wealth on other countries – through the channels of trade, investment, financial and knowledge flows – will be shaped by the combination of the type of endowments and the strategies adopted to integrate into the global economy. The challenges countries face and their potential arsenal of policy tools also hinge on the combination of these factors. Countries that are rich in natural resources of which China is in great need have enjoyed rising terms of trade, increasing exports and improving current account balances, but have also seen their competitiveness challenged. 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. Services exporters in developing countries have often been less successful in meeting China's large appetite for imports of services. In the medium term China's changing growth pattern will offer new challenges for developing countries: slower, but stable, demand for raw materials and higher demand for consumer goods and for a wide range of services.

Note: 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.

Introduction

Shifting wealth reshapes global economic relations. The opening up of China in 1978, together with the subsequent gradual economic liberalisation, its entry into the World Trade Organization (WTO) in 2001 and its robust growth path and tightening of economic ties with the global economy ever since, have been important factors shaping global economic relations. China's growth path has indeed been remarkable, but it is not unprecedented. Several other countries, notably recently the five other BRIICS economies (i.e. Brazil, India, Indonesia, the Russian Federation and South Africa), somewhat earlier the five "tigers" (Indonesia, Malaysia, the Philippines, Singapore and Thailand) and, going further back in time, the four "dragons" (Chinese Taipei; Hong Kong, China; Korea; and Singapore) have also experienced remarkable growth rates and progress along the value chain. Given, however, the size of China's economy and hence the impact of its rise on the world, the shifting wealth phenomenon – the major underlying principle of the *Perspectives on Global Development* – refers mainly to China's transformation. The "dragons" and the "tigers" have been successful in transforming their economies by well-designed policies, but the size of these economies means that their impact on the world could not be compared to that of China. More recently, a few other larger developing countries joined China as growth engines for the regional or even the global economy.

The rise of China – and to a somewhat lesser extent that of other emerging economies – has been reshaping global economic relations and has impacted on flows of trade, investment, finance, technology and knowledge to and from other developing countries. The purpose of this chapter is to identify groups of developing countries by their types of endowments and development strategies and examine how these different groups of countries are affected by the dynamism of some large emerging economies through those channels. The groups of countries considered in this chapter are economies based on natural resources, economies integrated into global value chains or competing in manufactured goods with China, and those that boast large service sectors. The chapter first describes the different thresholds and ways to define the country groupings followed by discussion of the impacts on the different country groups through the various channels. It concludes by discussing changes in the near and medium term in China and the opportunities that those changes open up for developing countries.

Through what channels does shifting wealth affect other developing countries?

Shifting wealth has been increasingly reshaping global trade, investment and, more recently, financial and knowledge flows.[1] China's accelerated economic growth, primarily based on processing and assembling manufacturing activities benefiting from low labour costs and economies of scale, turned the country into a workshop of the world. This transformation involved large flows of inward foreign direct investment (FDI) seeking to seize the opportunities of low-cost production and large flows of trade, importing parts and

components and exporting finished goods. Wealth created through this process has only to a small extent boosted imports of consumption goods, partly because of high household savings rates and partly because of the low import content of consumption. Foreign direct investment (FDI) inflows, alongside high capital spending by the government, have contributed to a rapid accumulation of capital, in particular in the business sectors, thereby boosting the potential growth rate of the economy. The liberalisation of other financial flows, such as debt and equity portfolio investment and cross-border lending, have been more gradual and some type of restriction still applies to most such flows.

The increasing flows of trade and investment also imply growing flows of the knowledge embedded in goods, services and technologies. Moreover, with the take-off of Chinese overseas FDI, such flows have increasingly become two-way. The internationalisation of the renminbi (RMB) and the direct convertibility and mutual acceptance of bilateral currencies between China and nearly a dozen regional economies will boost economic flows. This is particularly important for the increasing of flows at the external margin as more and more small firms will be able to engage in overseas economic activities without being constrained by the need to obtain foreign exchange for settlement purposes. The above channels have offered opportunities, and at the same time constitute challenges not only for OECD members but also for developing countries in positioning themselves in global economic relations.

The opportunities and challenges differ by country characteristics

The way shifting wealth affects a developing country's economy is to a large extent determined by the economic orientation of that country and the way it conducts its economic relations with the outside world. Countries that, for instance, rely on the production and exports of natural resources may face different challenges and need a different set of policies to reap fully the benefits of China's rapidly growing demand, compared with countries that participate in fragmented global supply chains and provide parts and components for final assembly in China. Furthermore, within countries dependent on natural resources it makes a difference whether a country produces the types of minerals of which China is in great need or the types China can also produce but the country in question can produce at a lower cost. By the same token, it also makes a difference for a country integrated into global value chains to what extent it competes with China, which in turn is tightly linked to its position along the value chain, its diversification capacity and also the geographical location.

Endowments such as natural resources or abundance of other factors of production may have an impact on the way the country is integrated into the global economy, but development strategies are important. Abundance of natural resources is an asset hard to resist exploiting, especially when there is robust demand for that resource. To avoid the natural-resource curse and the related loss of competitiveness of sectors not based on resources, strong institutional frameworks and policies are needed. By the same token, the abundance of low-cost labour is a natural base for manufacturing industries, but other complementary policies are needed to make manufacturing exports competitive in international markets, such as efficient production, good infrastructure and stable macroeconomic policies. The grouping of countries according to these characteristics may provide a better insight into the channels and ways shifting wealth affects them.

Resource-based economies have great natural capital and rely on their exports

Natural-resource endowments can be measured from various angles. The multiplicity of measures in the empirical literature allows for choosing the most appropriate variable for the question in case (Boulhol et al., 2008). The abundance of natural resources is best measured by the natural capital indicator constructed by the World Bank. It is the sum of pastureland, cropland, timber resources, non-timber forest resources, protected areas and subsoil assets expressed in US dollars and can also be expressed in per capita terms or as a share of total wealth. Total wealth, in turn, includes intangible capital, produced capital and urban land in addition to natural capital. The latest date for which this indicator is available is 2005.

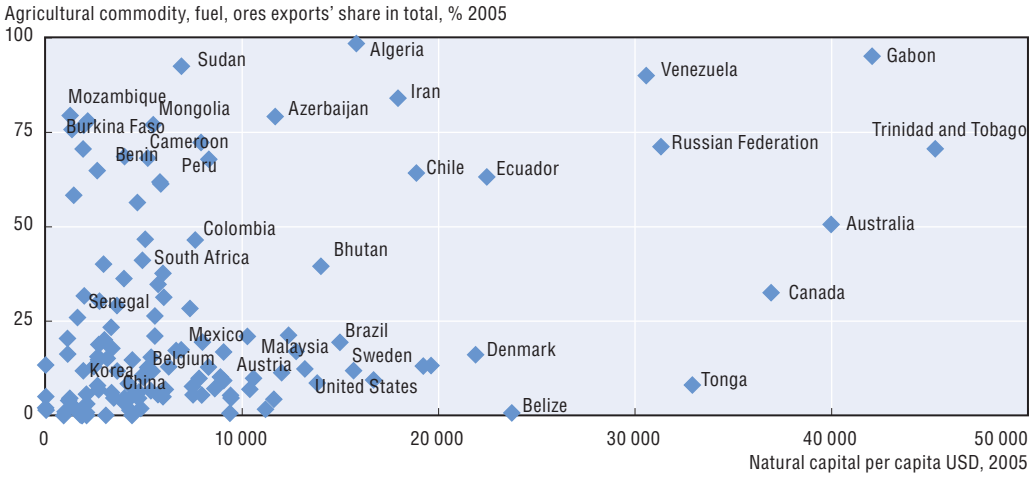
The main alternatives proposed are usually based on exports of primary products, which may better reflect the economic dependence on natural resources (as opposed to abundance). The most commonly used indicator is the ratio of gross primary exports to gross domestic product (GDP) (Sachs and Warner, 1995) but variants have also been proposed, including the share of primary exports in total exports, primary exports divided by total labour force (Lederman and Maloney, 2003) and the share of mineral exports in merchandise exports (Davis, 1995). However, export-based measures also suffer from two major limitations: one is a misrepresentation of the stock of natural resources for some countries and the other is endogeneity. For instance, gross primary exports as a share of GDP tend to boost artificially the importance of resource endowments in relatively small countries with high shares of both imports and exports. A measure based on the ratio of exports of primary products to total exports is less exposed to this latter type of distortion. Conversely, the ratio of exports to GDP tends to underestimate the underlying share of natural resources in countries that are relatively richly endowed but whose domestic consumption also tends to be resource-intensive. Moreover, resource abundance does not necessarily show up in the exports of natural resources. For instance, abundance in energy may show up in the large share of energy-intensive exports rather than in energy exports. All export-based measures share the problem of reverse causality: lower-income countries tend to have higher exports of primary products relative to GDP – or even more so relative to total exports – regardless of their true endowments.

To capture China's impact on economies based on natural resources, the share of natural resource exports in merchandise exports is considered the most appropriate. Notwithstanding the reverse causality problem, which tends to be serious in the case of low-income countries, this measure reflects rather economic dependence than merely the abundance of resources. For some countries, such as Algeria, Azerbaijan, Burkina Faso, Gabon, Guinea, Iran, Mongolia, Mozambique, Sudan, Venezuela and Zambia, the share of natural resource exports (defined as agricultural raw materials, fuel, and ore and metal exports) in total merchandise exports exceeds 75% (Figure 2.1).[2] Another dozen countries rely on natural resources for between 50-75% of their merchandise exports, while a further dozen between 25-50%. While it is arbitrary to define what constitutes the minimum share of natural resource exports for a country for it to be classified as an economy based on natural resources, the classification of the upper half may be unquestioned. What in turn may be questionable is whether a country with a share of between 25-50% of natural resources should also be classified as such. However, as most countries belonging to this band, such as Bhutan, Colombia, Indonesia and South Africa are known for their resource-based economies, the 25% threshold of natural resource exports' share in merchandise exports could also be applied to identify this group of countries.

Export dependence on resources is not identical to abundance in per capita terms. Although some economies that are heavily dependent on natural resources for their exports also tend to be abundant in resources, it is not always necessarily the case (Figure 2.1). Burkina Faso, Gabon, Mozambique and Zambia rely on natural resources for over 75% of their exports; nevertheless their natural capital stock in per capita terms is similar to those of Bangladesh, India or Korea, which are known for not being endowed with natural resources. Moreover, some countries with very large stocks in per capita terms, such as Australia, Canada, Tonga or Trinidad and Tobago, do not heavily rely on such exports in relative terms. The former group of countries tend to be low-income countries and hence the reverse causality issue discussed above is relevant, whereby primary exports tend to dominate regardless of endowments. The latter group of countries is more heterogeneous: there are high-income OECD countries, such as Australia and Canada, that have managed to diversify their economies and exports and there is Tonga, for instance, where the largest part of natural capital are protected areas, which may not be exploitable for exports. Trinidad and Tobago, though, has sub-soil assets but also relies on other sectors of the economy, as in the case of the two OECD members.

Figure 2.1. **Natural resource endowment in per capita terms and export dependence, 2005**

Per capita natural capital vs. resource exports share in total



Notes: Natural capital includes pastureland, cropland, timber resources, non-timber forest resources, protected areas and subsoil assets. Total wealth is the sum of natural capital, intangible capital, produced capital and urban land. Resource exports are defined as agricultural raw material, fuel, and ore and metal exports.

Sources: World Bank (2012a), *Total and Per Capita Wealth of Nations* (excel database) for the natural capital and total wealth indicators and World Bank (2012b), *World Development Indicators* (database), *http://data.worldbank.org/indicator* for the remaining indicators.

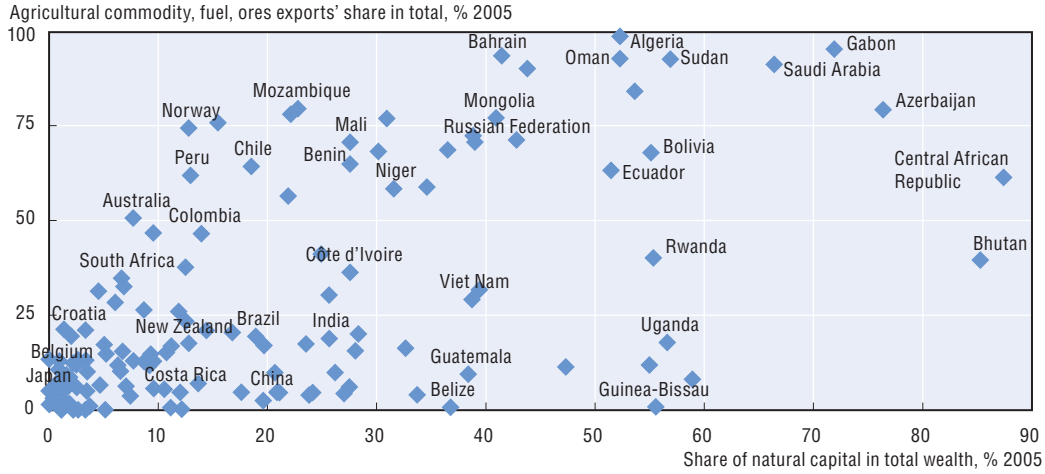
StatLink *http://dx.doi.org/10.1787/888932813003*

Lower-income countries tend to rely on resource exports not necessarily because they are abundant in the resources in per capita terms, but often because of the lack of other types of capital (intangible or produced or urban land) that could be employed in producing non-resource exports. Many of the countries that depend on the exports of natural resources to a very high extent, such as Azerbaijan, Mongolia or Sudan do not boast a high per capita natural resource stock. In their total national wealth, however, natural-resource

capital features prominently with a share over 40-50%, or, in the case of Azerbaijan, over 75% (Figure 2.2). Heavy dependence on exports of natural resources can therefore be explained by their relative abundance compared to other types of capital.

Figure 2.2. **Natural resource endowment as share of wealth and export dependence, 2005**

Share of natural capital in total wealth vs. resource exports share in total



Notes: Natural capital includes pastureland, cropland, timber resources, non-timber forest resources, protected areas and subsoil assets. Total wealth is the sum of natural capital, intangible capital, produced capital and urban land. Resource exports are defined as agricultural raw material, fuel, and ore and metal exports.

Source: World Bank (2012a), *Total and Per Capita Wealth of Nations* (excel database) for the natural capital and total wealth indicators and World Bank (2012b), *World Development Indicators* (database), *http://data.worldbank.org/indicator* for the remaining indicators.

StatLink *http://dx.doi.org/10.1787/888932813022*

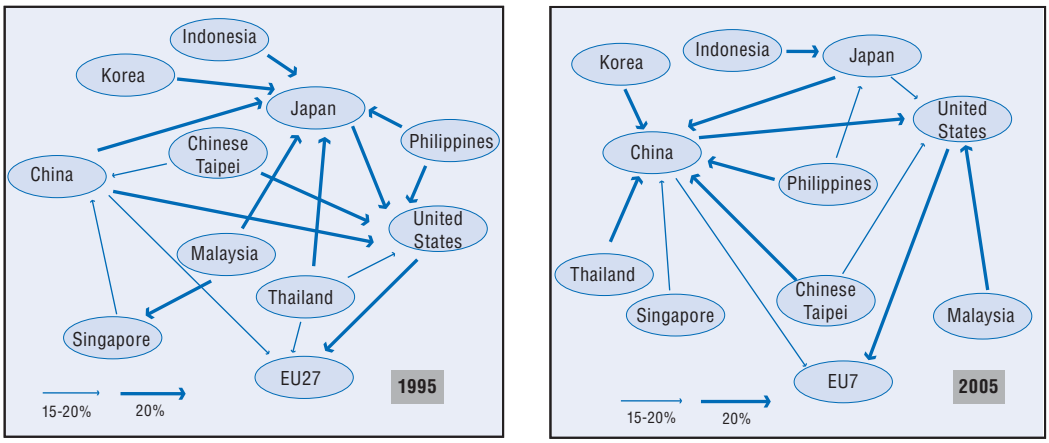
Countries engaged in global value chains are increasingly complementary to China

China's development into a global production platform has offered an opportunity for producers of parts and components to become integrated into global supply chains. China itself has long been integrated into global production chains, but earlier mainly as a supplier of parts and components to be added/assembled in Japan and other countries. Recent trends based on input-output analyses, however, show that between 1995 and 2005 China shifted from being a supplier of parts and components to developed countries to becoming the core production base for suppliers in other countries in the region (Figure 2.3). In 1995 two export markets for China's intermediate goods and services (Japan and the United States) exceeded the 20% threshold and only Chinese Taipei and Singapore directed at least 15% of their intermediate goods and services exports to China. By 2005, the production-slicing landscape had completely changed in Asia: by that year the United States remained the only economic entity receiving over 20% of Chinese intermediate goods and services exports. More importantly, China has become a production hub: in 2005 it received over 20% of intermediate goods and services exports of Chinese Taipei, Korea, Japan, the Philippines and Thailand and over 15% of those of Singapore. Such a transformation involved a long-feared hollowing out of industries in Japan, and more recently the phenomenon has spread to Korea. The shift of production from Japan, which in 1995 absorbed over 20% of the intermediate exports of six countries (China, Indonesia, Korea, Malaysia, the Philippines and Thailand) left it by 2005 with only Indonesia as a

major regional supplier (with over 20% of its intermediate exports destined for the Japanese market) and the Philippines as a minor one (with over 15% of its intermediate exports going to Japan). Korea, the Philippines and Thailand switched their major intermediate exports destination from Japan to China. In addition to the relocation of Japanese firms to China in search of lower production costs and closeness to a big market, the deliberate specialisation among Association of Southeast Asian Nations (ASEAN) members has also contributed to this process. This division of labour among ASEAN members involved, for instance, the concentration of electronics manufacturers in Thailand and car production, wood, and pulp and paper industries in Indonesia. Given the higher degree of fragmentability of production processes of electronics, the continuing division of labour translated into a deeper integration of Thailand into international supply chains.

Figure 2.3. **Asian economies are increasingly integrated with China through supply chains**

Partners for intermediate exports of goods and services 1995 vs. 2005



Note: If a country's intermediate exports (in both goods and services) to a particular partner country exceed a given threshold percentage of that country's total intermediate exports (15% or 20% in this exercise), such a trade node is considered as a dominant link.

Source: OECD (2010a), *Southeast Asian Economic Outlook 2010*, OECD Publishing, Paris.

StatLink http://dx.doi.org/10.1787/888932813041

Outside the Asian region, the involvement of developing countries in global supply chains (traced by their trade in intermediate goods and services) is limited. Neither African nor Latin American countries seem to have been successful in gathering around supply chains, be they global or regional (Figure 2.4).

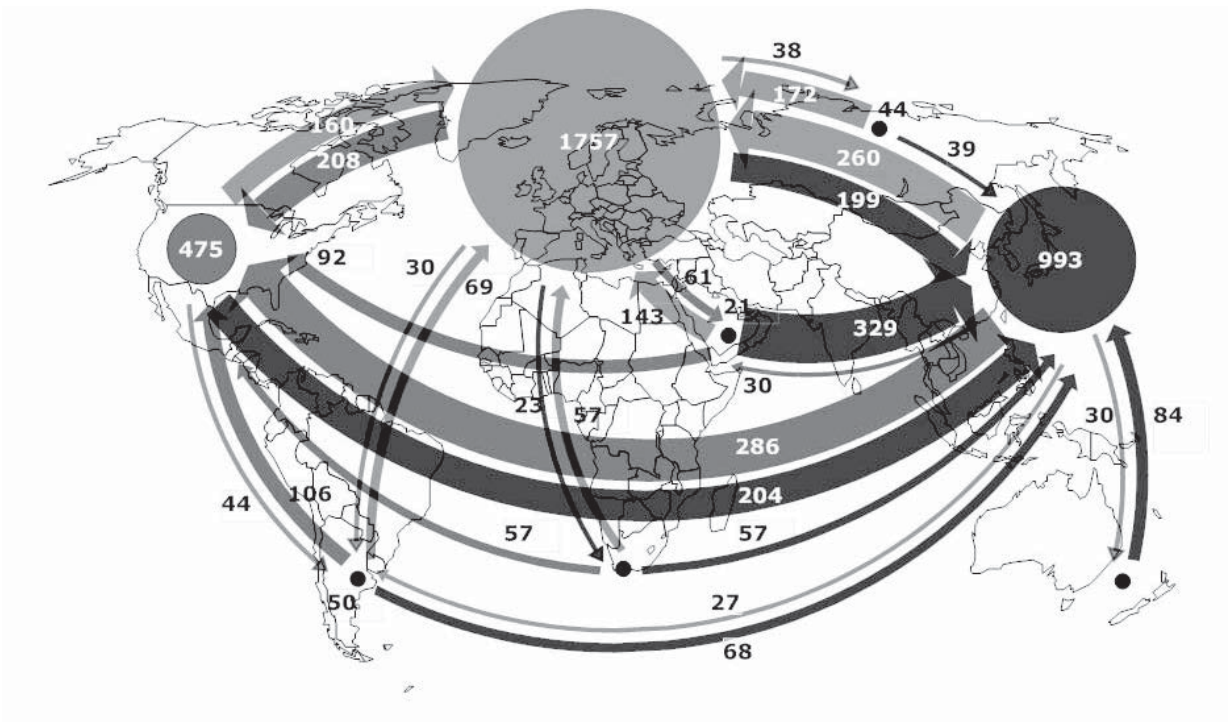
Few countries manage to compete in low-cost manufacturing

The ability of developing countries to compete in global markets depends on the combination of their ability to produce at competitive prices and, in the longer term, to produce high value goods and, in addition, a diversified structure the least similar possible to other countries' structures of goods. Indicators capturing these features will be employed to identify the set of developing countries that are closest to China in terms of international competitiveness. The export structure and type of export products have long been used as an indicator of external competitiveness and several further indicators have been derived from it. Hausmann et al. (2007), exploited the detailed product-level data to

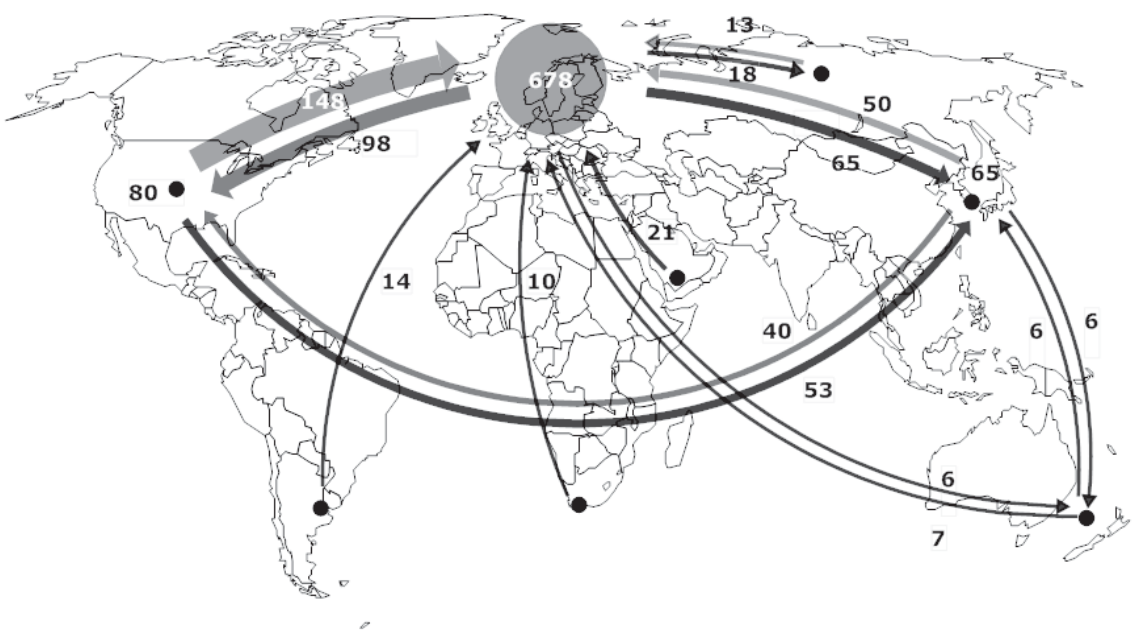
Figure 2.4. **Flows of intermediate goods and services between and within regions**

USD billion, 2005

A. Flow of intermediate goods



B. Flow of services



Source: OECD (2010b), *Measuring Globalisation: OECD Economic Globalisation Indicators 2010*, OECD Publishing, Paris.

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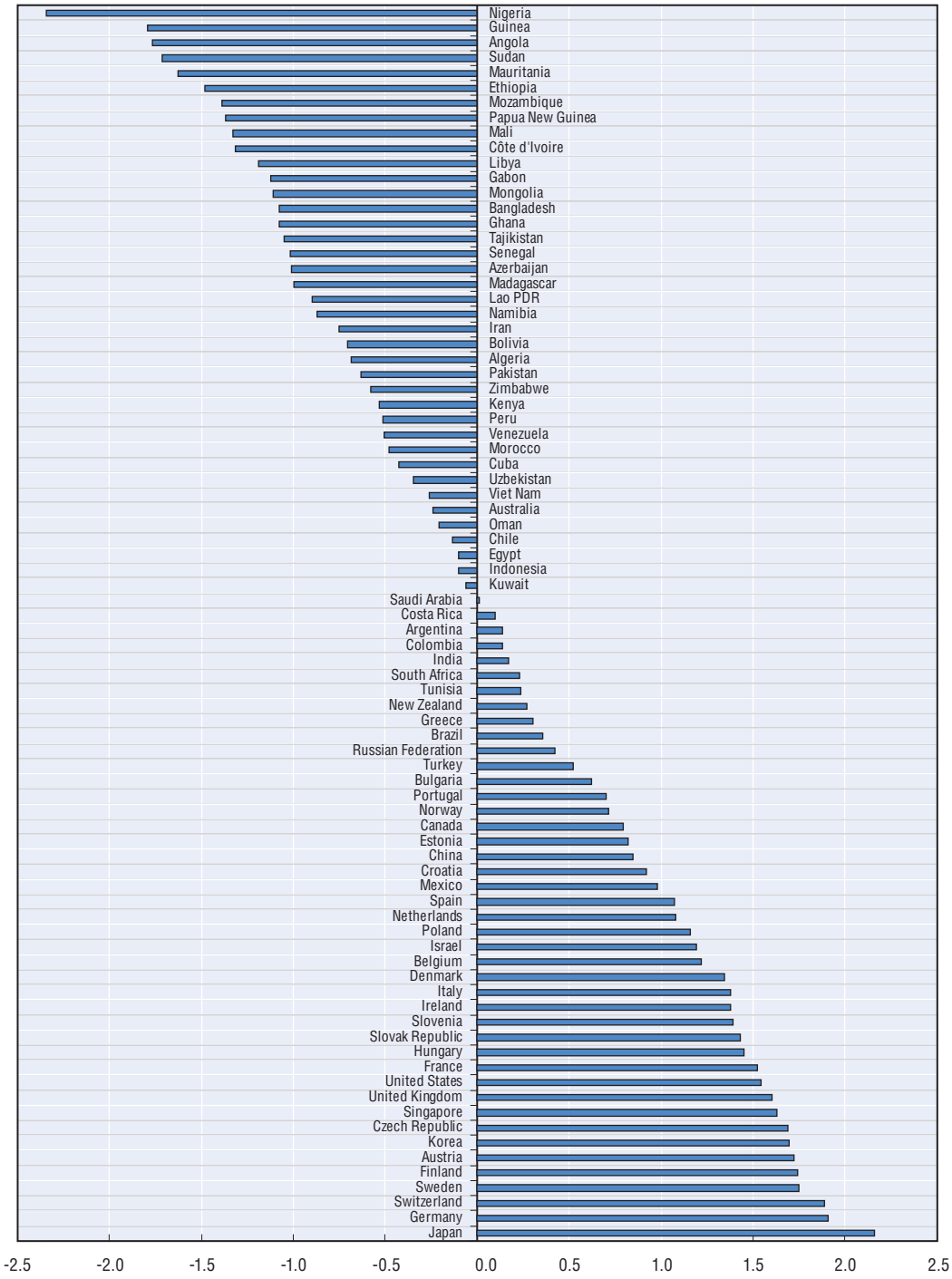
construct indicators capturing the diversification and ubiquity (number of other countries that on average make those products) of export structures. Their indicator, which combines these two dimensions using the so-called method of reflections into a capability index, was considered as best reflecting a country's capability both to produce different types of goods and to identify niche markets where it can have a quasi-monopolist position. According to this indicator, and as of 2010, developing economies "close" to China's "capability" level, defined as a combination of diversified and ubiquitous product structure, include Hong Kong, China; India; Malaysia; Mexico; Thailand; and, somewhat "further", Argentina, Brazil, Indonesia and the Philippines (Figure 2.5). Apart from most OECD countries only Croatia and Singapore (from the 127 economies for which the indicator is available) fare better than China by this indicator.

In addition to how diverse and how ubiquitous an export structure a country may have, the price at which it is able to produce those exports is also crucial for its competitiveness. A commonly used indicator to compare costs of production across countries is the unit labour cost for the manufacturing sector expressed in USD terms. A key to maintaining competitiveness is to keep these costs low, at least relative to competitors. Over the past half decade, Chinese Taipei appeared successful in reducing unit labour costs, while Singapore and Thailand also managed to maintain them at a flat level (Figure 2.6A). At the other extreme, Argentina and the Russian Federation (not depicted in the figure owing to very sharp increases in unit labour costs), as well as Brazil, China and South Africa experienced surges in their unit labour costs between 2005 and 2011.

Given, however, that the amount of manufactured goods that countries trade may differ, as well as their destination and origin, a relative unit labour cost (ULC) index is more relevant to monitoring competitiveness trends. The relative ULC index is competitiveness-weighted with the weights based on a double-weighting principle taking into account the structure of competition in both export and import markets of the manufacturing sector in 49 markets.[3] According to this index, Hong Kong, China; India; Indonesia and Mexico also managed to reduce their unit labour costs relative to competitors, in addition to Chinese Taipei, which also did so in absolute terms (Figure 2.6B). At the other extreme, Brazil, China and the Russian Federation saw the sharpest increases in relative ULCs. Although two other countries, Argentina and South Africa, experienced sharp increases in their ULCs over 2005-11, these increases did not hurt their competitive positions. This can be explained by differences in *i)* degree of importance of exports, *ii)* share of manufactured exports and *iii)* export/import markets. If, for instance, a country can identify some niche products or niche markets for its products (both for sourcing and destination) where increases in unit labour costs do not hinder their exports and do not replace their domestic production by imports (i.e. demand and supply of goods is inelastic to price), it may remain competitive, as long as it is able to identify such products and markets. Thus, a relative ULC index is more relevant than a simple ULC one. But even the relative ULC has its limitations: it only captures the manufacturing sector. While overall wages tend to be affected by rises in a few sectors, international competitiveness can differ largely across sectors. While in labour-intensive manufacturing sectors, unit labour costs may indeed be the most relevant measure of competitiveness, in capital-intensive or knowledge-intensive manufacturing they play a lesser role; as is the case with commodities, which tend to be capital-intensive, or services, which may be either capital-intensive (e.g. construction, transport, etc.) or human-capital intensive (e.g. professional services, research and development, etc.).

Figure 2.5. **Hausmann's capability indicator ranking of selected countries, 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 method of reflections as described in Hausmann et al. (2007).

Source: Jankowska, A., A.J. Nagengast and J. Ramón 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.

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Figure 2.6. **Trends in competitive positions measured by unit labour costs in the manufacturing sector**

2005 = 100

Note: Unit labour costs refer to the manufacturing sector and are expressed in USD terms and in an index form with 2005 as base year (2005 = 100). Relative unit labour costs are competitiveness-weighted indices where competitiveness weights are based on a double-weighting principle, taking into account the structure of competition in both export and import markets of the manufacturing sector of 49 countries. An increase in the index indicates a real effective appreciation and a corresponding deterioration of the competitive position. Argentina and the Russian Federation were deleted from Panel A for the sake of better visibility of the figure as their unit labour costs increased sharply over 2005-12.

Source: OECD (2012), *OECD Economic Outlook* (database), *http://stats.oecd.org/*.

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The price at which a country is able to supply a given product to a given market also reflects its ability to compete with others and hence how it responds to the shifting patterns of wealth. This indicator captures more aspects than unit labour costs do, as it includes not only labour costs but also other costs related to the production and trade

process, e.g. infrastructure costs. In certain countries, for instance Brazil, infrastructure costs are said to be a significant cost component (the *custo Brasil*[4]). To explore this avenue, the unit prices of exports were compared for selected producers in third markets. In particular, the ability of developing countries to supply products at unit prices close to those of China is relevant for their international competitiveness. About a quarter (earlier a third) of Chinese exports to the US market in categories where it competes with low and middle-income countries appear to be priced similarly to competitors' prices (within 10% above or below competitors' prices) (Figure 2.7A) and these products make up an increasing share of overall US imports, exceeding 4% in 2010 (Figure 2.7B). By contrast, the share of products where China differentiates its exports by attaching higher unit prices has been hovering around 5% over the last two decades. The share of such products in US imports had been below 1% until very recently. This shows that most low and middle-income countries tend to engage in price competition for most exports where there is overlap with exports by China. Price differentiation by quality is less apparent among developing countries.[5]

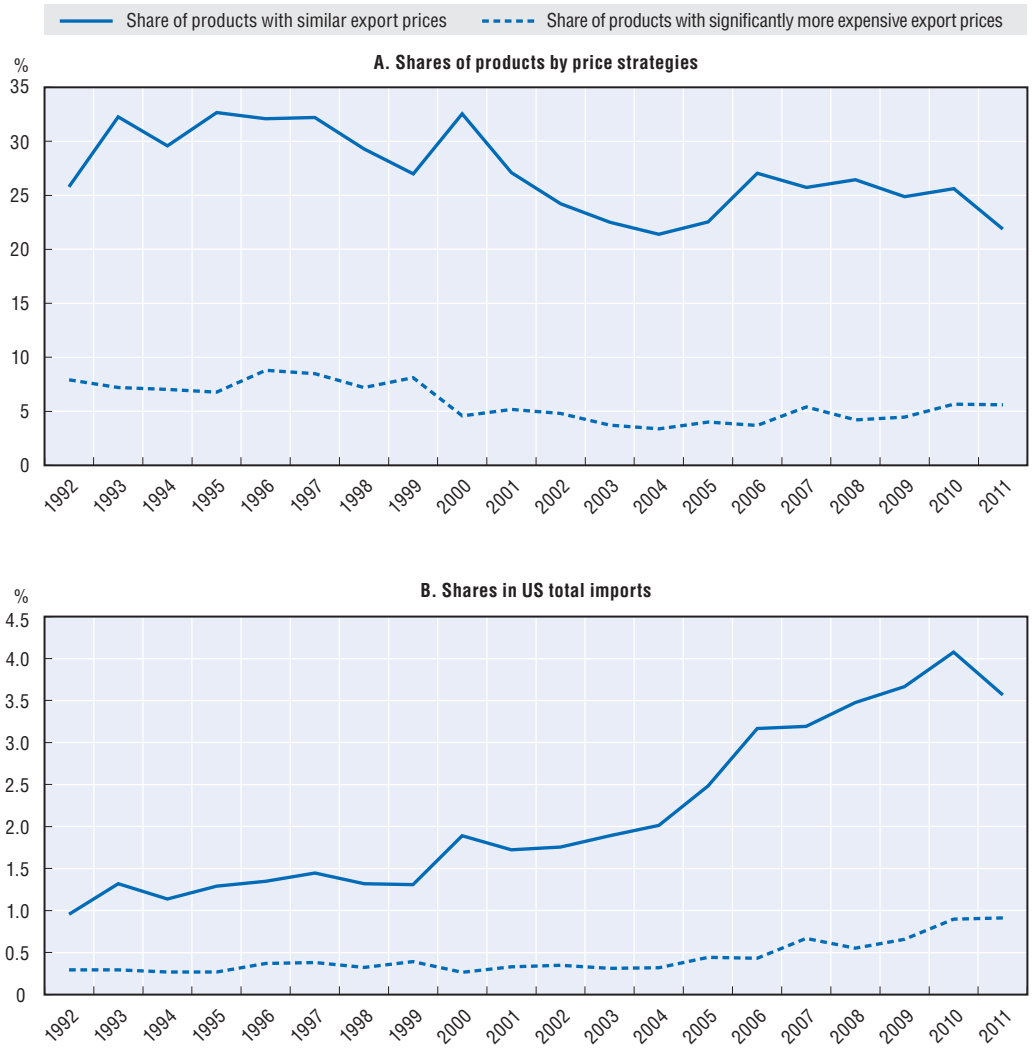
Classifying countries by their pricing strategies in third markets shows that almost a dozen and a half countries compete with Chinese products (i.e. attach unit prices within 15% of those for Chinese products in the same 6-digit HS category) to at least 50% of their exports to the US (Table 2.1). Examining unit prices and the shares of products in the same categories with similar or very different unit prices reflects more on the ability of countries to compete in prices and to differentiate goods in the same category rather than a simple comparison of market shares. This method comes however, with a caveat, in that it does not take into account the variety of products in which countries are able to compete with China in unit prices.

Table 2.1. **Classification of countries by pricing in third markets, 2010**

Competing with China (at least half of export products have unit prices +/-15% of Chinese unit prices)	Differentiating their products from Chinese exports (at least 50% of exports have unit prices at least 50% higher than Chinese unit prices)
Armenia	Afghanistan
Bolivia	Algeria
Chad	Azerbaijan
Congo, Republic	Benin
Ecuador	Bosnia and Herzegovina
Egypt	Central African Republic
Equatorial Guinea	Costa Rica
Kazakhstan	Former Yugoslav Republic of Macedonia
Libya	Gambia, The
Rwanda	
Saudi Arabia	Mauritania
Senegal	Moldova
Togo	Namibia
Uganda	Nepal
Ukraine	Niger
Zambia	Serbia
Zimbabwe	Singapore
	Tanzania
	Tunisia
	Yemen

Notes: Unit prices refer to CIF (cost, insurance and freight) prices. The third market is the US market. The comparison of unit prices is done at the 6-digit HS level. None of the countries was found to differentiate its exports from Chinese exports by attaching significantly (i.e. at least 50%) lower unit prices for at least 50% of its exports to the US. Many countries were found to compete with China in several categories and differentiate by price in other categories. These countries include Brazil, Cambodia, India, Indonesia, Lebanon, Morocco, Paraguay, Philippines, Turkey and Viet Nam.
Source: OECD calculations based on UNcomtrade (2012), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx*.

Figure 2.7. **Pricing by China and low and middle-income countries in the US market**



Note: Panel A shows the share of products in the US market in the same product categories at the 6-digit HS (Harmonised Commodity Description and Coding System) level where the unit prices of Chinese and low and middle-income producers are within 15% of each others' (continuous line) and the share of products where Chinese unit prices are at least 50% higher than those of low and middle-income competitors, similarly in the same product categories at the 6-digit HS level. Panel B depicts the share of products in US imports where Chinese and low and middle-income producers have similar unit prices (continuous line) and where Chinese exporters price their products at least 50% higher in the same product category (dotted line).

Source: OECD calculations based on UNcomtrade (2012), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx*.

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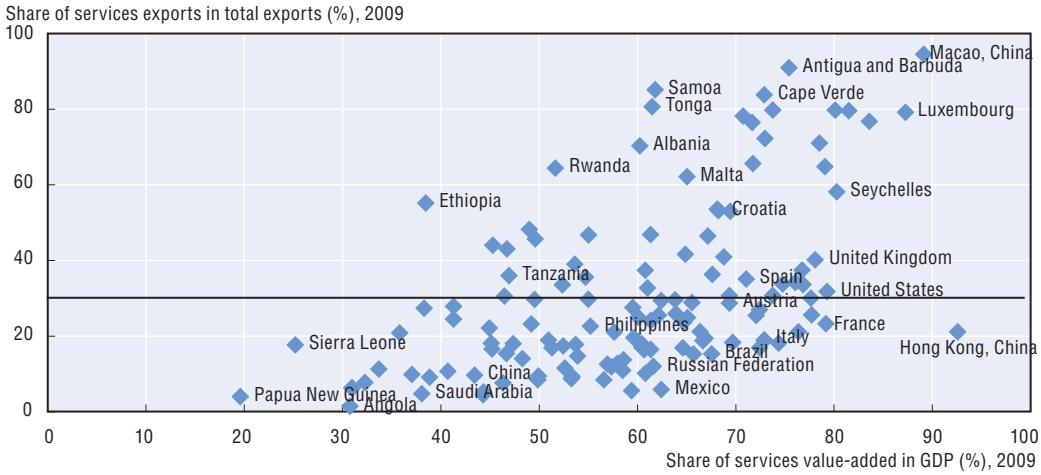
Specialisation in services is another avenue to explore for take-off

Some countries endowed with unique natural environments or abundant labour have specialised in services, either from a lack of other options or as a catch-up strategy. Small islands in the Pacific and the Caribbean with beaches and other wonders of nature have to a large extent relied on tourism as a major export product. In addition to such endowments, the other factor that may have had a weight in such specialisation is the sparseness of population. Without sufficient amounts of low-cost labour, economies of

scale are difficult to realise and thus manufacturing exports may find it difficult to compete in global markets. The costs of trade may also be higher for remote island states. Proximity to large markets has opened opportunities to establish information and communications technologies (ICT) businesses in some small island states, in particular in the Caribbean. Not only small states have, however, identified services as their niche industries on which to rely for development. Larger countries, such as Egypt, Ethiopia, India, Tanzania and Uganda rely on services for over 30% of their exports and Paraguay, the Philippines and Uruguay for over 20% (Figure 2.8). Thus the abundance of one of the two types of endowments of natural environment and labour paved the way for service-based development in some countries.

Figure 2.8. **Shares of services exports in total exports and services value-added in GDP, 2009**



Note: Services exports as defined in the Balance of Payments.
Source: World Bank (2012b), *World Development Indicators* (database), *http://data.worldbank.org/indicator*.
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Endowments and strategies shape how shifting wealth affects developing countries

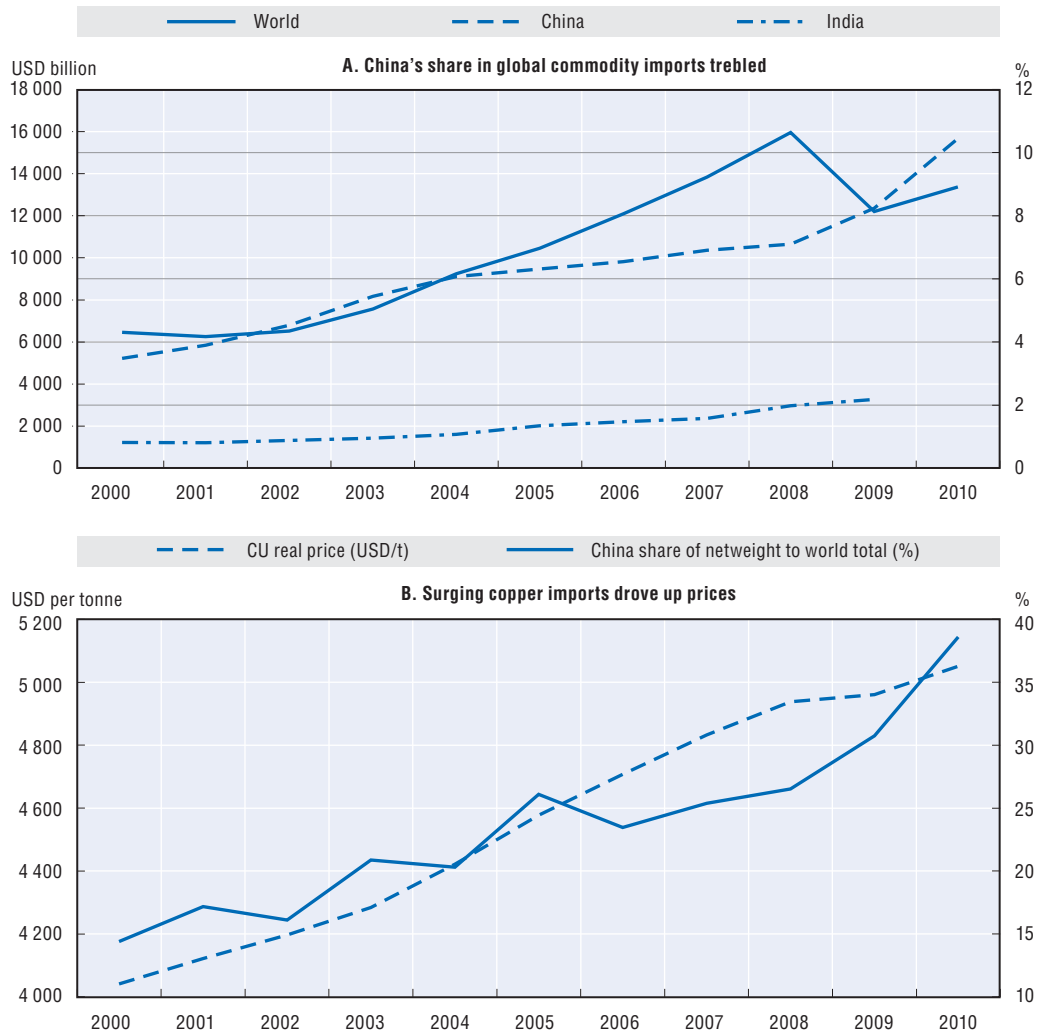
The impact of shifting wealth through the channels of trade, investment, financial and knowledge flows will be shaped by the combination of the type of endowments the country possesses and the strategies it adopts to integrate into the global economy. This implies that the challenges countries face and the potential arsenal of policy tools also hinge upon the combination of these factors.

Most resource-based economies have benefited from surging demand in China

Countries rich in natural resources which export minerals, hydrocarbons and other raw materials of which China is in great need have been blessed by rising terms of trade, increasing exports and improving current account balances, but also cursed by loss of competitiveness and other impacts. China's rapid growth boosted demand for a series of commodities, tripling its share in world commodity imports from 3.5% in 2000 to close to 11% in 2010 in value terms (Figure 2.9A). Investment-led growth in China implies a high level of commodity intensity, in particular in commodities needed for capital goods and construction materials. Soaring demand in China for such commodities drove up prices and led to improving terms of trade in commodity-exporting countries. An example is

copper, for which China commands roughly 40% of world imports and which experienced a quadrupling of prices between 2000 and 2010 (Figure 2.9B). Demand for copper originates in all parts of the economy: it is used for power generation and for the grid, for construction, for home appliances and for the manufacture of other goods. Major beneficiaries among developing countries are Chile and Peru which depended on the Chinese market to the extent of over 40% and 30%, respectively, for their copper exports in 2010.[6] As a result of China's soaring demand for copper and the abundance in both Chile and Peru of this ore, both countries increased their ratio of exports over GDP radically from 2000 to 2010: Chile from 20% to 35% and Peru from 10% to nearly 20%.

Figure 2.9. **China's demand for commodities has been robust**



Note: Panel A: World imports in USD (left hand-side scale) and shares of China and India in percentages (right hand-side scale). Panel B: copper prices in USD per tonne (left hand-side scale) and copper imports expressed in growth rates of values (right hand-side scale).

Source: Authors' calculations based on UNcomtrade (2012), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx*, and London Metal Exchange (2012), *Pricing and Data* (database), *www.lme.com/en-gb/pricing-and-data/*.

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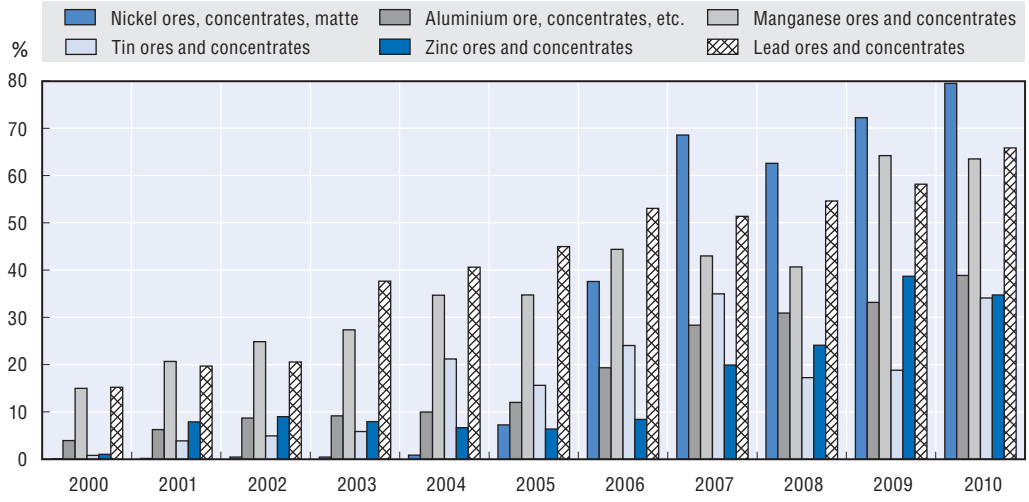
Copper, however, is far from being the only mineral from which commodity exporters benefited: there are several other metal ores of which China is an almost purchaser in the global market. These include nickel with 80%, lead with 65%, manganese ore 62% and other ores with over one third of global imports (Figure 2.10). Major beneficiaries of commodity booms in these ores include Indonesia and the Philippines, reaping the benefits of nickel production booms; Brazil, Gabon, Myanmar, South Africa (and Australia) benefiting from soaring manganese ore prices; and India, Oman, Pakistan, South Africa and Turkey from rising chromium prices. Manganese ore is used in steel-making and a surge in capital spending in a large economy can trigger price hikes. China quintupled its imports of this ore from 2000 to 2010, but from a large net exporter of manganese ferroalloys over the past decade it turned into a net importer in 2012. Similarly, exports of electrolytic manganese metal, used in the making of stainless steel, have recently started to fall, alongside exports of steel. China still remains the largest producer of electrolytic manganese metal but high domestic demand and rising energy prices for wholesale users discourage exports of processed metals that require imported raw materials and that are highly energy-intensive to produce. For comparison, India quintupled its share of manganese ore imports in global exports just between 2004 and 2008 (Figure 2.11), a much shorter period for a five-fold increase in the share than that seen in China, but the initial share of imports was much more modest, at only around 1% of world exports. Nevertheless the pace of increase is indicative of future trends that are likely to follow India's accelerating growth and urbanisation in the coming decades. Many mineral-rich countries, in particular Peru, South Africa and Zambia, also 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. They are less measurable, but Chinese provision of infrastructure, coextraction of resources and other FDI have likely been generating substantial knowledge flows to resource-rich developing countries.

Figure 2.10. **China commands over 30% share in world imports of several metals**

Percentage, 2000-10



Note: The categories of metal ores and concentrates refer to the 4-digit level of the HS classification.
Source: Authors' calculations based on UNcomtrade (2012), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx*.

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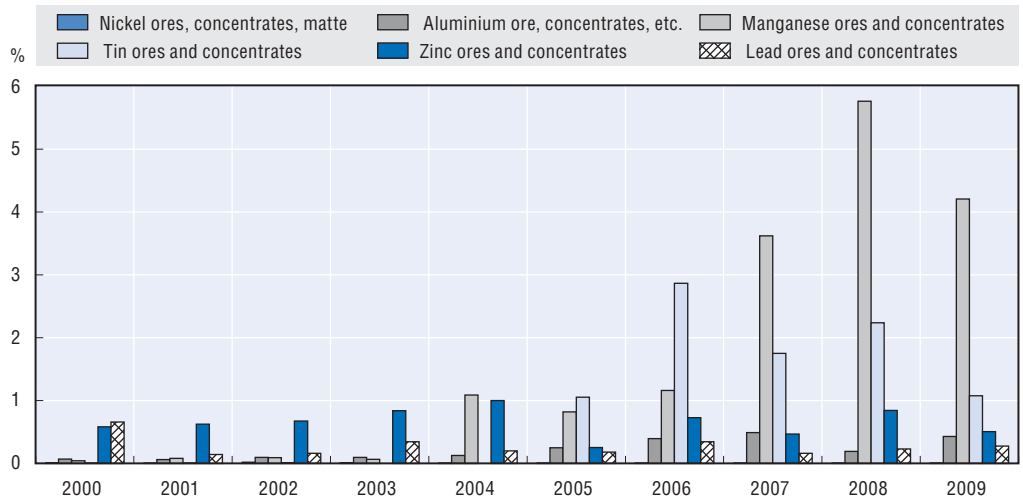
Figure 2.11. **India's appetite for metal ores has been modest, but rapidly increasing**

Percentage of world exports, 2000-09



Note: The categories of metal ores and concentrates refer to the 4-digit level of the HS classification.
Source: Authors' calculations based on UNcomtrade (2012), *United Nations Commodity Trade Statistics Database*, *http://comtrade.un.org/db/default.aspx*.

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Hydrocarbon exporters have also benefited from China's rapid growth, with Angola, the Russian Federation and Saudi Arabia in particular depending to an increasing extent on the Chinese market. China is the world's second largest oil consumer (accounting for 10% of global consumption) and about half of China's consumption relies on imports. In addition to rapidly expanding export markets, hydrocarbon-abundant countries have also received large Chinese investment in their resource sectors. Such investments were led by state-owned firms acquiring stakes in oil fields in various parts of the world. Acquisitions have not, however, been limited to upstream industries; filling stations and processing industries have also benefited from Chinese capital exports. In addition, many resource-rich countries established joint production facilities in China, building on joint comparative advantages. Even in coal, China has turned from being a net exporter to a net importer in the last couple of years. Although imported coal in 2011 made up only about 5% of Chinese electricity generation, it accounted for nearly 20% of the world seaborne market, thereby exerting an increasing influence over global thermal prices. Soaring mineral and hydrocarbon imports are to a certain extent interrelated, as the smelting and pressing of ferrous and non-ferrous metals, chemical material production and non-metal mineral manufacturing together account for a third of China's electricity consumption.[7]

In addition to mineral and hydrocarbon exporters, countries abundant in agricultural raw materials of which China is in great need have also seen an export boom over the past decade or so. The opening of China to international trade coupled with its low level of agricultural productivity naturally led to soaring imports. Having been a net exporter till the mid-1990s, China now takes nearly 80% of world soybean exports. Major sourcing markets for soybeans include Argentina, Brazil and the United States. In 2010 soybeans made up about 70% of Argentine exports to China, though soybeans constitute only 5% of total Argentine exports. Brazilian soybeans constitute a lower share of the country's

exports to China (25% to 30%), but with another 40% share of iron ore, Brazil's dependence on the Chinese market for its commodities exports is also high.

China's appetite for raw materials imports in general has been large, but in the case of some minerals, in particular rare earth metals, it has roughly half of global resources buried in its own soil. Such metals are essential for the production of hard-disk drives and electric and hybrid vehicles, among other uses, thereby promising constant high demand in the foreseeable future. The large-scale extraction and exports of such resources in China in the past decades made exploitation and exports too costly in other countries. Some producers left the market and closed down mines, including some in several countries of the Commonwealth of Independent States (CIS) and the United States. This trend, however, has reversed recently and some types of rare earth metals have seen several-fold price increases over the past couple of years, leading to a starting-up of production in Australia (Mt Weld) that was earlier than planned and the reopening of mines in the United States (e.g. Mountain Pass). Among developing countries, Brazil and Malaysia are the major beneficiaries of the rare earth metal price hikes.

But the commodities boom also raised several policy challenges for resource-based economies

Resource-based economies may also be cursed by appreciating exchange rates, rising labour costs, loss of competitiveness in manufacturing industries and other challenges brought about by the commodities boom. Countries also have to deal with the risk of rapid exhaustion of non-renewable resources.

The boom in the commodities sectors boosts demand in other sectors and pushes up wages, which, in turn, spill over to other sectors that do not usually experience productivity gains that would justify the wage increases. This leads to a loss of competitiveness of labour-intensive exports in international markets and to an increased reliance on commodities exports and production, which may constitute a serious constraint on the diversification of the economy. The decline in manufacturing activities is particularly harmful as manufacturing industries often have positive knowledge and other spillovers. Diversification of the economy through the promotion of linkages to the extractive industries is seen by many developing commodity exporters as a way to avoid the resource curse. The extension of domestic value chains with resource-based manufacturing (downstream/forward linkages) and increased domestic sourcing of equipment and services (upstream/backward linkages) facilitates the creation of jobs and technological learning. A critical element of developing upstream industries is investment in technical skills and technology needs. Governments will need to consider how local engineers and technical workers should be trained, and more broadly what type of educational policies should be pursued to stimulate the local processing of natural resources and to foster economic diversification. Small and medium-size enterprises may also face bottlenecks preventing them from providing inputs for mining operations and oil and gas companies which could be addressed by targeted policies.

Another potentially harmful by-product of excessive reliance on commodities exports is exposure to the volatility of commodity prices in world markets, often translating into domestic macroeconomic volatility. Moreover, commodities exporters often need to tackle large inflows not only through the current but also the capital account, as foreigners invest in their natural resource sectors in the form of FDI, equity participation, bond purchase or cross-border lending. China's outward FDI to resource-rich developing countries made up

over 5% of its FDI outflow in 2010 and cross-border lending to such countries has also been significant. Flexible exchange rates can effectively dampen the impact of volatility in external markets. Switching from a fixed regime to flexible rates has indeed played a stabilising role in, for instance, Mongolia, where the depletion of reserves to maintain the fixed exchange rate threatened a balance of payments crisis a couple of years ago. Many other commodity exporters opted for flexible exchange rates (e.g. Colombia and Indonesia) mostly combined with relatively free flows of capital, while another group of resource-based economies chose fixed exchange rates (e.g. Bhutan and Brunei). Moreover, fixed exchange rates can coexist with virtually completely closed capital accounts as in the case of Bhutan and virtually completely open ones as in the case of Brunei. The choice of exchange rate regime is a complex issue where many factors need to be taken into account.

Exchange rate policy, however, is not the only tool to cope with volatility. The insulation of the impact of the commodity boom from the domestic economy can help in reaping its benefits while minimising the downsides. This is mostly done by setting aside the proceeds from booms in separately managed funds. Less common, but apparently very effective in reducing volatility, is to engage in long-term contracts for the exports of commodities. While this may imply the foregoing of potential short-term profits in spot markets, the example of Brunei illustrates that even an economy fully based on resources with no capital controls and with the extreme type of fixed exchange rates – the Brunei dollar (BND) is fully interchangeable with the Singaporean dollar (SGD) at par – can lead the economic stability ranking of the World Economic Forum.

Also, exporters of natural resources that do not have direct economic links with China have been affected through indirect channels. Increasing Chinese demand improved the terms of trade of commodities exporters who were not exporting to China, as most commodity prices are determined in international markets. Such economies benefited from low interest rates in global markets and may have experienced some downsides of the commodity boom, like other countries that are directly linked to the Chinese market.

The changing patterns of shifting wealth will imply changing patterns of benefits for resource-based economies. China is in the process of shifting from an economy led by business investment to one relying more on infrastructure investment and from an investment-led growth to a more consumption-based one. Drastic ageing of the population will reduce potential growth in the long term and excess capacity in several industries will lead to moderation of growth in the medium term. At the same time, income levels are rising in China, producing an ever growing middle class, and environmental and other considerations will reduce the resource intensity of slower growth (discussed in detail in Chapter 1).

Economies sharing supply chains with China have increasingly been benefiting from shifting wealth

The expansion of production in China along global and regional supply chains has been implying an ever increasing demand for parts and components produced by other economies. Thus countries that share supply chains with China are benefiting from a similar ever-increasing demand for their exports. This shifting pattern of supply chains, from being Japan-centred to becoming China-centred over the decade between 1995 and 2005, has provided a cushion for many Asian countries, in particular in Southeast Asia during the recent downturn. Many countries, by shifting their export destinations from the

developed world more towards China and other large regional economies, managed to survive the deepest slumps in the past few years unscathed (OECD, 2011).

The biggest beneficiaries are countries that participate in highly sliceable supply chains such as in electronics industries and enjoy locations that enable them to compete for procurement contracts of large multinationals. Most of these economies are in Southeast Asia including Malaysia, the Philippines, Singapore and Thailand, or in East Asia such as Chinese Taipei or Korea. The electronics supply chain in East and Southeast Asia is characterised by a high degree of both vertical and horizontal differentiation. Not only are different segments of the production process located in different countries to exploit their advantages, but the origins of procurement are also highly diversified, intensifying competition among suppliers in the region and resulting in highly efficient multinational firms. Low tariffs for electronics products have also contributed to the reduction of multi-country sourcing and production. In contrast, tariffs on automobiles, motorcycles and parts are high in general, with most-favoured nation (MFN) tariffs between 20% and 40% in ASEAN countries. Thus, for the creation of multi-country production networks in automobile manufacturing, free trade areas (FTAs) appear crucial.

Low tariffs and service link costs are prerequisites of participation in supply chains and economic co-operation agreements may also foster integration into value chains. In addition to unilateral reforms, low tariffs can be achieved through FTAs, economic partnerships (EPAs) or other economic co-operation agreements that aim to boost economic ties. High import tariffs aiming to advantage domestic suppliers are unlikely to attract companies seeking export platforms as they would not be able to exploit the advantages of competitive sourcing. Economies deeply integrated into global value chains typically exhibit a flat tariff structure with relatively little tariff escalation, reflecting low effective protection at the industry level (WTO and Institute of Developing Economies [IDE-JETRO], 2011). Using FTAs, however, involves fixed costs, mainly related to the certificate of origin requirement and service links, that an exporter wishing to use a FTA needs to assume. To be able to assume the fixed costs, the firm needs to be large and/or efficient (Hayakawa et al., 2009; Takahashi and Urata, 2008, 2009; Hiratsuka, 2011). The costs of customs procedure, the material costs and time needed also have to be competitive for effective participation in supply chains.

Is the lack of an industrial base a problem for countries taking short-cuts through joining supply chains?

Joining a supply chain may provide a shortcut to industrialisation but it is not equivalent to building a supply chain. Geographical proximity to a supply chain and a low-cost, flexible and trainable labour force, as well as a business-friendly economic environment, may these days offer a shortcut to developing countries to produce and export products that may have taken decades to develop in earlier industrialisers. But not having gone through the learning process, and not having built broad and deep industrial bases to achieve that, pose new challenges for the developing world today (Baldwin, 2011). For instance, hosting only a slice in the production process may limit spillovers to the domestic economy and the specialisation of workers in a certain production process may not be conducive to upgrading or diversifying skills. Assembly activities do not typically raise overall skill requirements. Hence, there are limits to development based on joining supply chains that are attracted by low costs of labour partly because labour costs are only one component of total costs and partly because such investments tend to be mobile and

search for lower-cost locations once wage pressures arise. In sum, without the right policies to spread the benefits over the economy, this could lead to a polarisation between foreign-invested and domestic sectors. Acquiring skills in design and marketing is crucial to upgrading in global supply chains (Humphrey, 2004).

Shifting wealth puts pressure on China's competitors in third markets

Exporters of manufactures have been facing increasing competitive pressure as China has been entering into the production of an ever widening range of goods (and, to a much lesser extent, services). Wood and Mayer (2011) view China's trade opening as a shift in world average factor endowments which changed relative factor endowments and hence comparative advantages across countries. This shift, as they estimated for developing countries, translated into a decrease of labour-intensive manufacturing output in the sum of labour-intensive manufacturing and primary outputs, the two types of activities that tend to be crucial for developing countries. The extent of this decrease was between 1-3.5 percentage points (ppt) and the corresponding figure for the decrease in exports was 1.5-5 ppt during the 1980-90s. Countries found to have been most affected are East Asian countries that are open and have a large degree of similarity to China's export structure. To respond to competitive pressures, countries around the world have adopted various strategies. Several found their niche industries, where they face less competition from China, or adopted rationalisation measures in industries to enhance efficiency. Such rationalisation, while desirable to boost productivity, may have also resulted in the concentration of export markets or increased specialisation, which is the opposite of what would be expected in a developing country. Instead of specialisation, which leads to a reduction in the number of goods produced, diversification is desirable to achieve larger spillovers of knowledge and technology across industries.

Many countries that are competitors of China in third country markets are also recipients of Chinese manufacturing investment. Particularly if the country has a large market, it is often the best strategy for Chinese manufacturers to shift production to that market to tailor production to local needs, to improve access to local markets (including by avoiding trade barriers) and to make use of competitive labour forces. The electronics goods producer, Haier, has been exploiting the advantages of localised production in several countries in Southeast Asia and Chery, a car maker, is building a plant in Brazil. Such market-seeking FDI is also beneficial for the recipient country not only as a form of additional capital, which is often needed in developing countries, but also as a way of creating jobs and disseminating overseas technologies and management practices. Such transfers entail the flows of technology and knowledge through management practices, production methods and other know-how of the firm through which it transforms its inputs of capital, labour and materials into a product. Spillovers can take the form of "horizontal" flows of technology and knowledge to local competitors as well as "vertical" flows to backwardly linked suppliers. Spillovers tend to be strong when knowledge can be rapidly transferred and when domestic firms are able to absorb that knowledge. FDI may also crowd in domestic investment as it lowers the costs of adopting new technologies and thus enhances growth. In addition, by boosting demand for specialised inputs, and thus increasing the marginal productivity of investment in those inputs, FDI may also boost domestic investment. In terms of manufacturing industries, transport equipment, machinery equipment, textiles, special purpose equipment and electronics are the leading industries for investment by Chinese companies overseas.

Only a few countries are relatively insulated from competition from China, and these very likely only temporarily. At the high end of the value chain manufacturers have differentiated their products by branding or by quality. High-cost countries have reacted to increasing competitive pressure by outsourcing production to lower-cost locations. Companies able to produce highly differentiable products thanks to their embedded superior technology or branding have increasingly become targets of mergers and acquisitions by firms from China and other rapidly growing developing countries. Some examples include the acquisition of the personal computer (PC) arm of IBM by Lenovo or the purchase of Volvo by Geely, a Chinese car maker. Also, many struggling small and medium-sized enterprises (SMEs) in Japan have been saved by Chinese buyers. But even more importantly, Chinese companies have acquired some world leaders, in particular in heavy machinery. A symbolic example is Putzmeister, the German world leader in the production of concrete pumps, acquired recently by a Chinese firm. This technology-seeking FDI appeared a successful model for catching up countries and created value in the countries where firms were acquired.

At the low-end of the value chain, only a handful of countries are able to compete with China in terms of cost. A study of the textiles and garments industries, for instance, showed that only a few countries, including Bangladesh and Viet Nam, could effectively compete on price (Molnár and Kowalski, 2008). Some of the countries in this group have also been beneficiaries of relocation of Chinese industries at the lower end of the value chain, though so far only on a small scale. Such outsourcing, be it in the form of FDI or exports by local producers, entails the flow of knowledge to the host countries and provides an opportunity to integrate into the global economy. Such FDI also boosts local productivity growth and hence accelerates the catching up process. A major challenge for these countries is to keep labour costs low, which may be ensured by inflows of an unlimited supply of labour from the countryside to urban areas and/or high population growth. Nevertheless an integrated response is needed to meet the ever increasing demand for higher skills, efficient production and delivery which may involve a set of policies ranging from productivity-boosting supply-side measures to greater government involvement on the demand side.

Service exporters in developing countries compete less but benefit less from China's rise

Services exporters in developing countries have been facing less intense competitive pressure from China in international markets, but they have also been less successful in meeting China's large appetite for imports of services. China has been less successful in competing in services export markets compared to manufactured goods markets as its economy is highly manufacturing-based, with a low share for services, and it remains a major importer of services. Services imports, however, are mainly sourced in developed countries. This potential, untapped by other developing countries, is partly related to the types of services China imports in large quantities such as transport, tourism and business services. In addition, insurance services and royalties and licence fees also feature as being in high demand in China's balance of payments. In net terms, the largest deficits in China's services trade are recorded in business services (e.g. marketing, accounting, architecture, engineering etc.), transport services and insurance. These types of services are highly intensive in capital or skills, which means developed countries benefit from China's soaring import demand, but leave little room for services exporters in developing countries

to enter this rapidly expanding market. Even in tourism, developed markets tend to be the main destinations for Chinese tourists.

One of the few major beneficiaries among developing economies is Hong Kong, China, supplying about 15% of China's services imports, though that is a large drop from a quarter a decade ago. Reflecting the prominent role of Hong Kong, China in supplying a large share of services demanded on the mainland, this special administrative region (SAR) accounted for 70% of Chinese outward FDI in stock terms and 63% in flows terms in 2009 (CEIC database) and nearly three quarters of these flows were recorded in three service industries. These are leasing and commercial services (with 39%), financial services (21%), and wholesale and retail trade (nearly 14%). Hong Kong, China, with its highly developed logistics, financial and business services, offers an ideal gateway for mainland companies to establish an international presence and by the same token for foreign companies to access the Chinese market. Some types of services, such as, for instance, various business services, communication, finance and insurance, to a large extent involve the transfer of knowledge and technology as person-to-person provision is common in these services that are often provided by natural persons.[8]

Conclusion

The impact of the integration of China into the world economy has differed according to the type of endowments, specialisation patterns and industrial development strategies of different countries. Exporters of natural resources have been in general major beneficiaries of shifting wealth, accumulating inflows of export payments and of capital primarily seeking to secure the uninterrupted supply of the highly needed resource but also to reap the benefits of economic booms related to commodities. Although some commodities exporters also suffered the curse of macroeconomic volatility, exchange rate appreciation, rising labour costs and loss of competitiveness in non-resource sectors, successful examples suggest that natural resources can be more of a blessing than a curse. This has more been the case in economies that succeeded in channelling the proceeds from natural resources into areas that pave the way for long-term development. Notwithstanding the structural slowdown of the Chinese economy, as well as its shift to lower resource intensity in the medium to long term, resource-rich economies are likely to benefit from stable demand from China and increasing demand from other large economies with high growth potential such as India or, to a lesser extent, Indonesia. Likewise, as these countries will aim to secure the supply of commodities, direct investment into resource-based economies is also expected to remain strong.

While exporters of manufactures may have faced competitive pressure from Chinese manufacturers squeezing their margins and forcing some to leave the market, stiffer competition has also very likely contributed to innovative solutions for survival in the global arena. This includes not only product and process innovation at the frontier, but also more efficient production by a better use of the factors of production in economies further away from the frontier.

The 2002 move by China to encourage explicitly firms to go overseas is likely to have an extended impact. With China acquiring ever higher levels of technologies and ever better-known world-class companies, recipients of Chinese FDI will also benefit from technology and knowledge spillovers. Large markets will also remain attractive for building on local knowledge, customising products and avoiding trade barriers. Local employees of

Chinese-invested firms will learn new technical skills as well as getting acquainted with new management styles. Capital exports also take the forms of equity participation, project lending or cross-border bank financing thereby contributing to meeting capital deficits in developing countries.

With the moving up of China on the value chain, coupled with an increasing scarcity of its low-cost labour, production segments of the value chains with low added value are expected to be increasingly outsourced, benefiting countries that are behind in the chain. In the target countries for China's outsourcing, labour-intensive stages of the production process will help absorb the large number of new entrants to the labour market and will likely contribute to the diversification of production. China's switching growth drivers from investment to consumption in the medium term are also likely to shift production in many developing countries producing consumption goods. Such opportunities in factories will trigger inflows of rural labour into cities and hence drive urbanisation in many developing countries, as has been seen in China. China's moving up the value chain will, at the same time, inadvertently exert pressure on economies at present sharing the same supply chains with China to move upwards or adopt other strategies.

Services-based developing economies, in particular those with abundant high-skilled labour, could reap the benefits of increasing demand for services stemming from urbanisation and the constraints of local production. Beyond trade, investment and technology flows, the rise of China has also led to the transmission around the globe of its traditional wisdom in a broad range of areas including traditional medicine, an entrepreneurial mind-set and Confucian values, thanks to a large extent to its worldwide diaspora.

The rise of China and its impact through the shifting wealth process have reshaped global economic relations by boosting competitive pressures and offering new opportunities in trade markets, by attracting and at the same time supplying large amounts of capital and by seeking and disseminating knowledge and technology. The phenomenon of shifting wealth can be seen as more of an opportunity than a threat provided that developing countries put in place the right set of policies that responds to the new challenges of the world economy. This means putting in place policies to sustain the creation and upgrading of production and knowledge capabilities and mobilising skills, infrastructure and finance to increase competitiveness.

Notes

1. China's rise has also undoubtedly contributed to its increasing share in global development assistance and has likely influenced migration flows, but those issues will be outside the scope of the discussion.
2. A few countries were found to be outliers as they possess over USD 50 000 of natural capital in per capita terms. These countries include the United Arab Emirates, Norway, Saudi Arabia, Bahrain, Oman and New Zealand and, for the sake of better visibility, were excluded from the figure.
3. The 49 markets are: United States; Japan; Germany; France; Italy; United Kingdom; Canada; Australia; Austria; Belgium; Czech Republic; Denmark; Finland; Greece; Hungary; Iceland; Ireland; Korea; Luxembourg; Mexico; Netherlands; New Zealand; Norway; Poland; Portugal; Slovakia; Spain; Sweden; Switzerland; Turkey; Estonia; the Russian Federation; Slovenia; Chinese Taipei; Hong Kong, China; Singapore; China; India; Malaysia; the Philippines; Thailand; India; Argentina; Brazil; Chile; Israel; South Africa; EU12; EU13; EU15. EU15 refers to the members of the European Union prior to the 2004 enlargement and EU12/EU13 to the euro-area without/with the Slovak Republic.

4. On 11 September 2012, the President of Brazil, Dilma Rousseff, announced tax cuts on electricity. The cost of electricity is boosted by 28 different taxes which together account for almost half the average bill. All in all, residential bills shall fall by an average of 16%, and industrial ones by 19-28% (The Economist, 2012).
5. A similar exercise between Chinese and Japanese products in the US market revealed that almost three quarters of the Japanese products have at least four times higher unit prices than those of the Chinese competitors, so there is clear product differentiation by quality/prices.
6. Moreover, copper made up 60% of Chile's exports to China and China absorbed 25% of total Chilean exports in 2010. The same figures for Peru were 55% and 20%, respectively, in the same year.
7. Although it needs to be mentioned that more than 60% of China's electricity is coal-generated and the share of hydrocarbons in generation is less than 10%. Nevertheless, the market is expanding breathlessly: China's power consumption doubled during the past six to seven years.
8. The so-called "Mode 4" provision by WTO terminology.

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Chapter 3

The new productive landscape and the renewed interest of developing countries in industrial policy

This chapter discusses the renewed interest of developing countries in industrial policy. The global economic landscape is undergoing deep and rapid changes. The development of China and other emerging economies is reshaping the geography of production and innovation. In response to the new landscape, many developing economies are implementing targeted policies both to sustain growth and to support structural transformation.

Introduction

The rise of new industrial powers and the growing uncertainty about the global economic landscape are reshaping development opportunities (OECD, 2010a). The new context is not a guarantee of industrial upgrading and job creation, unless targeted policies are implemented because, notwithstanding the impressive growth performance of developing countries in the last decade, there are still deep structural asymmetries between advanced and developing economies. Diversification and upgrading are ongoing in developing economies, but are often confined to "islands of excellence". Development and the accumulation and mastering of production and technological capabilities[1] take time. These are long-term processes that go hand in hand with the strengthening of institutions and with the creation of backward and forward linkages both within the economy and with foreign partners.

Developing countries are implementing industrial policies to sustain growth and to foster production transformation. Each country has a specific policy model, but policy makers are facing at least two common concerns: *i)* how to position their country to take advantage of the changing competitive landscape; *ii)* how to ensure high growth rates and transform them into inclusive development opportunities. The experience of successful countries and a growing interest in new economic thinking are encouraging proactive government actions to shape development trajectories.[2] The challenge is to clarify which are the most appropriate levers for intervention and the right sequencing of actions.

This chapter discusses the renewed interest in industrial policy in developing economies. The first section presents an overview of the major changes in the global competitive landscape. It highlights the achievements of China and of other emerging and developing countries in reshaping the global geography of production and innovation. The second focuses on knowledge and technology and highlights, despite the advances, the persistence in differentials with more advanced countries. The third section discusses the renewed interest in industrial policy and describes the variety of approaches that developing economies follow in policy implementation.

The productive landscape is changing rapidly

This section sketches out the main changes in the global competitive scenario, recalling: *i)* the rise of China and its impact on the global geography of production and innovation; and *ii)* the rise of manufacturing in developing economies.

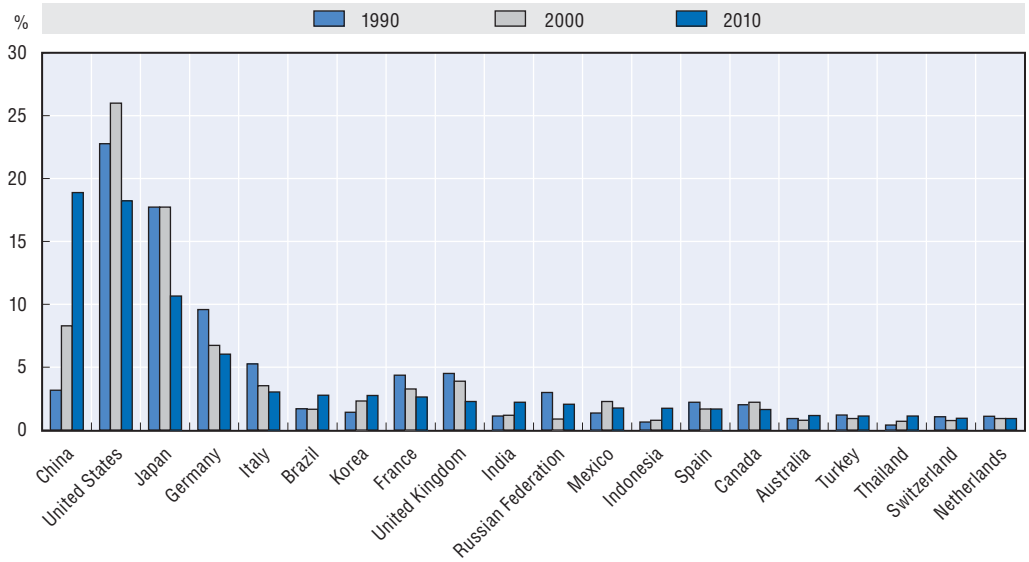
China is changing the geography of production and innovation

The rise of China is changing the global production landscape. China is today the world's largest manufacturer. Its share of total world manufacturing value added in 2010 (18.9%) outperformed that of the US (18.2%) (Figure 3.1). Its speed is also exceptional. In 1990 China accounted for only 3% of total world manufacturing output; over two decades

this share has increased six-fold. The rise of this giant is introducing major changes in the global landscape that other countries need to take into account in designing their strategies for the future (Barros de Castro, 2009; Castro and Castro, 2012).

Figure 3.1. **World top 20 manufacturers, 2010**

Country share in total world manufacturing value added



Note: Manufacturing refers to industries belonging to International Standard Industrial Classification (ISIC) divisions 15-37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the ISIC, revision 3.

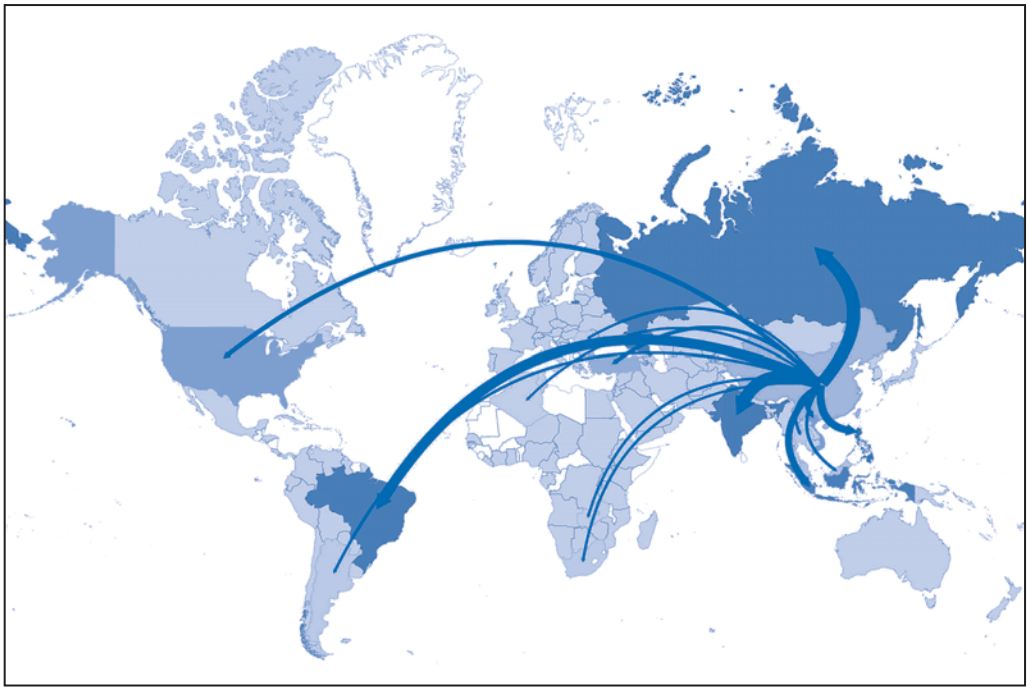
Source: UNStats (2012), *National Accounts Main Aggregates Database*, United Nations Statistics Division, *http://unstats.un.org/unsd/snaama/Introduction.asp*, (accessed March 2012).

StatLink *http://dx.doi.org/10.1787/888932813212*

The rise of China is changing international productive partnerships. China has made the axis of world trade shift East and South. It has become a major trade partner not only for Asian economies, but also for Latin America and Africa (OECD, 2011a; see Chapters 1 and 2). In 2011, China accounted for 19% of total African exports, while in 2000 that share was only 5%. African imports from China also grew from 5% of total imports in 2000 to 17% in 2011 (these figures are based on updates from the African Development Bank [AfDB], OECD, the United Nations Economic Commission for Africa [UNECA], the United Nations Development Programme [UNDP], 2011). In 2012, China was also the world's top destination for foreign direct investment (FDI) with a total volume of USD 170 billion, followed by the United States, Brazil and the United Kingdom. In addition, China has also started to generate FDI outflows, totalling USD 42 billion in 2012[3] (OECD, 2013a). The Russian Federation, Brazil, India and Indonesia, as well as a growing number of African countries, are major recipients of Chinese FDI both in terms of capital expenditure and job creation (Figure 3.2; fDi Markets database, 2012).

The rise of China is also changing the innovation landscape. After decades of manufacturing, Chinese factories have accumulated capabilities and learned how to move up in the value chain. The country is becoming a location for innovation. The gap with global innovation hotspots persists, but is shrinking. Chinese companies are increasing their investments and returns on innovation. For example, 19 Chinese companies appear

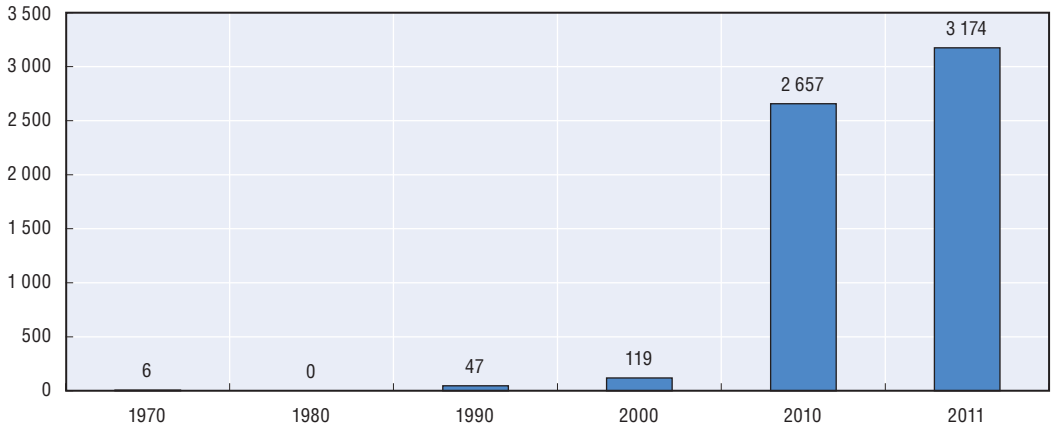
Figure 3.2. **Top 15 destinations of Chinese foreign direct investment outflows, 2003-12**



Note: The size of the arrows indicates the number of jobs created by Chinese FDI from January 2003 to December 2012 in the top 15 recipient countries. The difference in shading corresponds to the size of the arrows: a darker shading indicates a higher amount of jobs created. The graphic only includes data from greenfield and expansion-related investments; merger and acquisition transactions are not captured.
Source: Authors' calculations based on fDiMarkets (2012), *fDiMarkets: Crossborder Investment Monitor*, a service from the Financial Times Ltd., *www.fdimarkets.com/*. StatLink *http://dx.doi.org/10.1787/888932813231*

in the ranking of the world top 1 400 research and development (R&D) investing companies. The first Chinese firm in the ranking, Huawei, operates in telecommunication equipment and ranks 56th. It is followed by Petro China (76th), and by Railway China (92nd) (European Commission, 2011). As China accumulates innovative capacities, it has also

Figure 3.3. **Rising patenting in China, 1970-2011**
Number of patents granted to Chinese inventors by the USPTO



Source: Authors' calculations based on USPTO (2012), *United States Patent and Trademark Office: Patent Statistics* (database), *www.uspto.gov/patents/stats/index.jsp*. StatLink *http://dx.doi.org/10.1787/888932813250*

begun protecting intellectual property. The number of patents granted to China by the United States Patent and Trademark Office (USPTO) rose from fewer than 10 in the 1970s and 1980s to more than 3 000 in 2011[4] (Figure 3.3). China is also accumulating skills and improving the quality of education (Box 3.1).

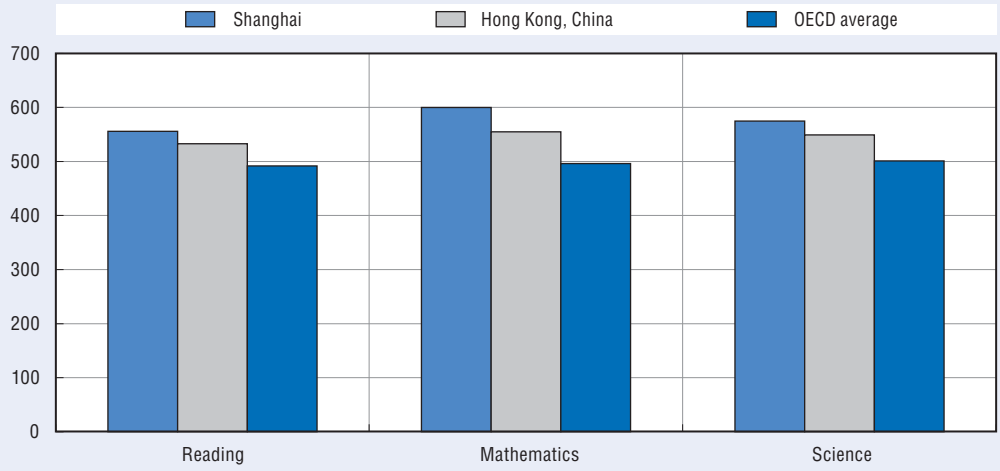
Box 3.1. **Secondary education in China: PISA results, 2009**

The OECD Programme for International Student Assessment (PISA) is an internationally agreed framework for the assessment of the quality and efficiency of education systems in some 70 countries around the world. Every three years it measures the educational outcomes of 15-year-old students in reading literacy, mathematics and science and thus provides an internationally comparative benchmark of global student performance.

PISA has for a long time included Hong Kong, China and the region has always ranked among the top performers. In 2009 PISA included Shanghai for the first time. The city achieved the highest reading performance in PISA 2009, ahead of the top-ranking OECD countries, Korea and Finland. Hong Kong, China and Shanghai ranked among the top three in mathematics and science (Figure 3.4).

Figure 3.4. **PISA scores, China, 2009**

Mean score



Source: Authors' calculations based on OECD (2010), *PISA 2009 Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, OECD Publishing.

StatLink http://dx.doi.org/10.1787/888932813269

Having included Shanghai and Hong Kong, China in the PISA assessment is a first and positive step. However, given the size and variety of development stages within China new measures accounting for other territorial realities are needed to give a clearer picture of skills development and learning in the country. Differences in student performance within countries are measurable in many OECD economies, but in China this is still a goal to be accomplished.

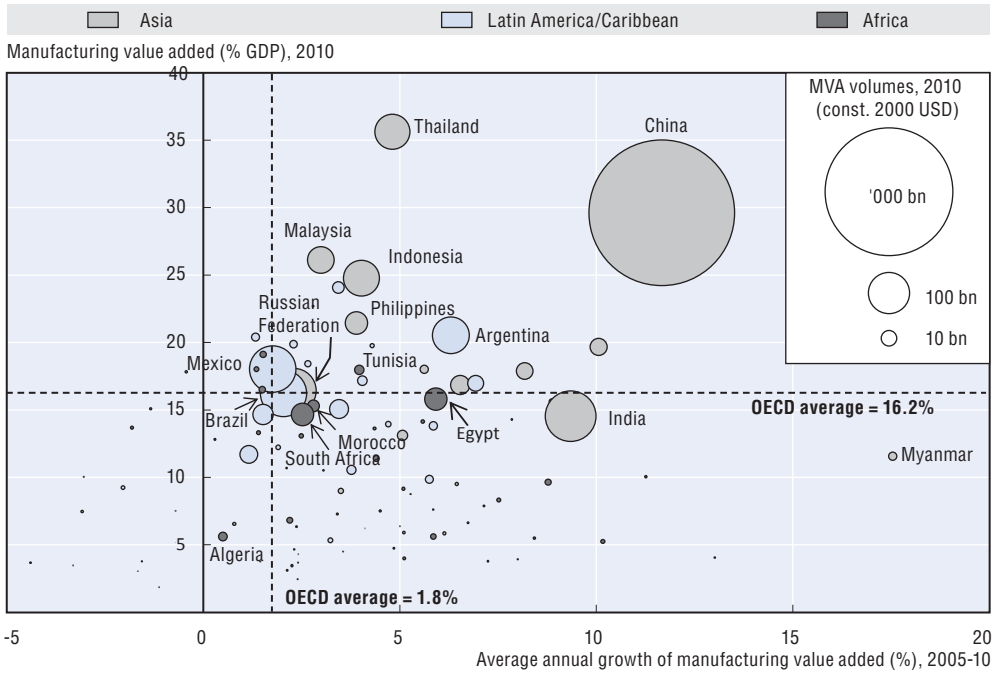
Source: OECD (2010c).

Manufacturing is rising in developing economies

Manufacturing is shifting to China, but it is also growing in most developing economies. The share of non-OECD economies (excluding China), in total world manufacturing value added rose from 14% in 1990 to 20% in 2010[5] (UNStats, 2012). Six of

the top 20 world manufacturers are non-OECD economies[6] (Figure 3.5). Developing economies show different patterns. For example, Indonesia, Malaysia, the Philippines and Thailand are more specialised in manufacturing than the OECD average and in these countries manufacturing is growing at a faster rate than in OECD countries. Egypt, India, Morocco and South Africa are catching up (i.e. they have a manufacturing output that is growing more rapidly than in OECD countries, but have lower proportions of manufacturing in gross domestic product [GDP] than the OECD average). Brazil and the Russian Federation seem to struggle, exhibiting some of the lowest levels of manufacturing output growth in all emerging economies, and a manufacturing intensity close to the OECD average (Figure 3.5). The rise in manufacturing is also accompanied by growing trade between developing economies. For example, India and Brazil, together with China, are emerging trade partners for Africa. They increased their share of total African trade from 2.3% and 1.7% respectively in 2000, to 7% and 3% in 2011. New trade partnerships open new technology transfer opportunities (Box 3.2).

Figure 3.5. **Manufacturing, intensity and dynamism in developing economies, 2005-10**



Note: OECD average: Manufacturing value added (%GDP) = 2009 data or latest.

Source: Authors' calculations based on UNStats (2012), *National Accounts Main Aggregates Database*, United Nations Statistics Division, *http://unstats.un.org/unsd/snaama/Introduction.asp*, (accessed March 2012), World Bank (2012), *World Development Indicators* (database), *http://data.worldbank.org/indicator*, and OECD (2012f), *STAN STructural ANalysis Database*, *http://stats.oecd.org/*, for OECD average, July 2012.

StatLink *http://dx.doi.org/10.1787/888932813288*

Together with growing opportunities for hosting the production of goods and components, globalisation favoured production unbundling, allowing vertical disintegration and delocalisation (Baldwin, 2006). But unlike in early stages, firms do not delocalise only to profit from lower labour costs. Delocalisation has also started to be driven at least in part by local assets, including a skilled labour force and proximity to emerging markets and consumers. Companies are starting to carry out research, design

Box 3.2. **Brazil strengthens its strategic partnership with Africa: The role of EMBRAPA**

Since the early 2000s the Brazilian government has explicitly acknowledged the strategic importance of Africa. Brazil has strengthened its partnership with the continent on various fronts, including trade, investment and the sharing of knowledge and technology. Africa is a strategic priority partner for government organisations including the Brazilian Export Promotion Agency (APEX), the National Development Bank (BNDES) and the Brazilian Agricultural Research Corporation (EMBRAPA).

A major pillar of the partnership with Africa is the sharing of technology and knowledge, especially in the areas of natural resources and agriculture. Brazil has a long-standing tradition of excellence in applied research to preserve the environment and increase the productivity of agriculture. EMBRAPA was created in 1973 as an institution attached to the Ministry of Agriculture. Its mission was to increase the value added and the sustainability of agricultural and livestock production in Brazil. It carries out applied research, develops technologies which are put at the disposal of producers, with no intellectual property charges, and fosters technology transfer; rural extension services are required to deliver the technical solutions to rural producers. EMBRAPA also works in partnership with big firms to carry out experimental and applied research.

Recently, EMBRAPA has strengthened its partnership with Africa, increased collaboration with the Forum for Agricultural Research in Africa (FARA) and opened a local branch in Ghana. EMBRAPA Africa is in charge of knowledge sharing and technology transfer to improve the competitiveness of agricultural products in Africa and their access to global markets. It carries out research programmes and offers technical assistance. It also participates in the Africa-Brazil Agricultural Innovation Marketplace, an initiative targeting smallholder producers aiming to enhance agricultural innovation for development in Africa.

Source: EMBRAPA (*www.embrapa.br*) and Africa-Brazil Agricultural Innovation Marketplace (*www.africa-brazil.org*). Last accessed October 2012.

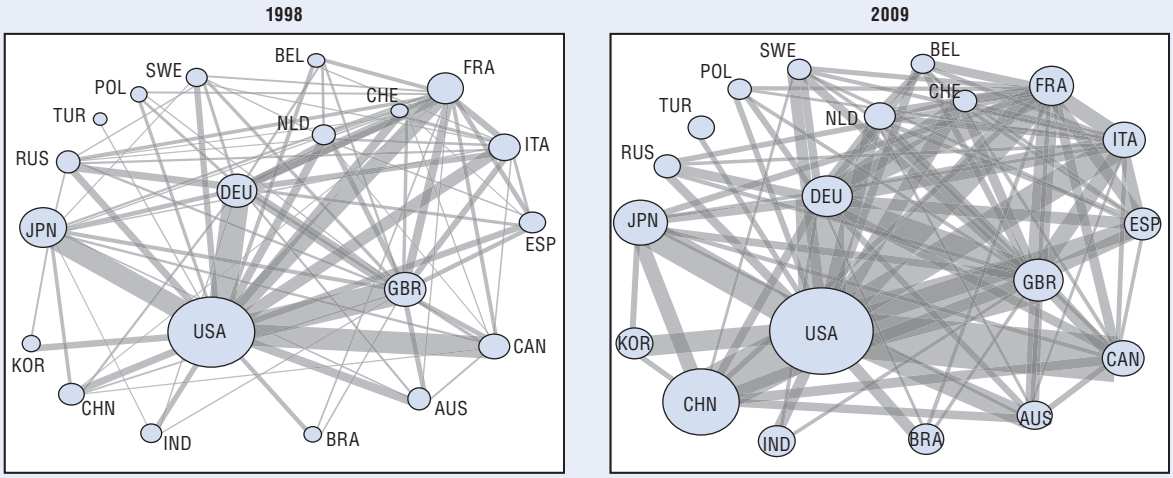
and innovation activities in developing economies, a possibility which was not in prospect a decade ago (Box 3.3). This higher value-added delocalisation has mostly benefited countries with some degree of local knowledge capacities and large domestic markets, such as China and India. Today these countries are perceived as future markets with rising demands from the so called "new middle classes" and with a growing skills base at competitive costs. However, some small economies have also managed to profit from the new forms of organisation of production, thanks to attractive incentive packages and a good skills base, as in the case of Costa Rica, which has gradually gained ground as a location for high-end manufacturing in small-scale high-value-added production, such as medical devices (OECD, 2012b). In addition, as emerging economies develop, they delocalise certain phases of production in the search for lower wages. For example, the displacement of textiles from China to Viet Nam, or the shifts of manufacturing activities within China are creating opportunities for learning in new territories. Those changes have opened up opportunities for learning that were not available before. In general, the traditional division between the North – specialised in activities with a high knowledge content – and the South, – specialised in the provision of raw materials and goods and services with low knowledge intensity –, is changing. This goes beyond China. It involves, at a different pace and on a different scale other countries. Some have benefited from

Box 3.3. **Emerging economies are increasing their participation in global innovation**

Research capabilities and scientific production are growing in emerging economies. As a consequence, their participation in global innovation networks is increasing. China has increased the number of co-authored publications with foreign researchers and the number of countries with whom its researchers collaborate. India, Brazil and the Russian Federation have also increased their participation in global research networks, but to a lesser extent (Figure 3.6).

Figure 3.6. **Scientific articles and co-authorship, 1998 and 2009**

Numbers based on whole counts



Note: The area of the bubbles reflects the number of scientific publications and the thickness of the link indicates the intensity of the collaboration (i.e. co-authorship).

Source: OECD (2012e), *Science, Technology and Industry Outlook 2012*, OECD Publishing, Paris.

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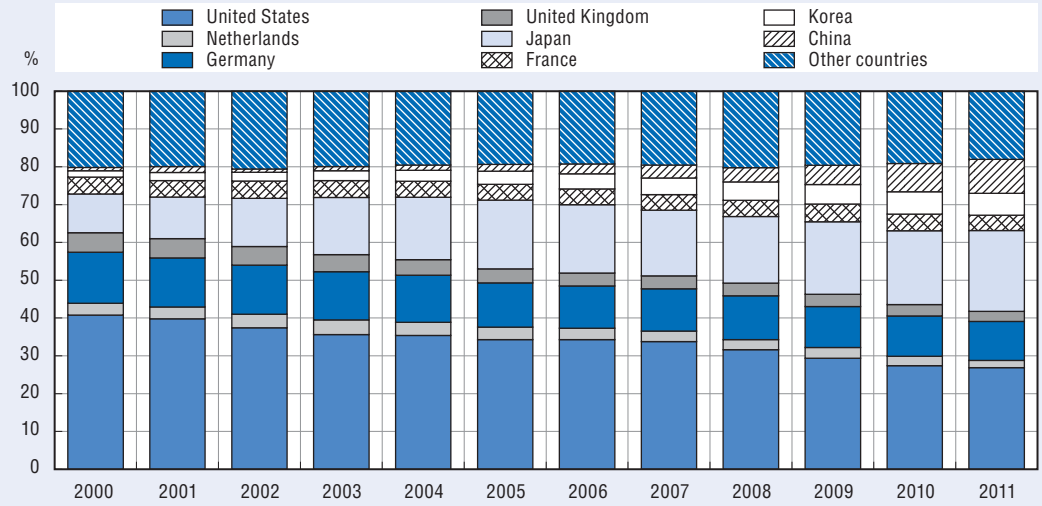
Patent applications have been rising world wide, and new actors are entering the game. The share of the US in total Patent Co-operation Treaty (PCT) filings fell from 40% in 2000 to 27% in 2011. By contrast, Asian countries showed a remarkable increase. China accounted for only 0.8% of total PCT filings in 2000 but for 9% in 2011. Korea's share also rose, from 1.7% in 2000 to 5.7% in 2011 (Figure 3.7).

Figure 3.7. **Country shares in total Patent Co-operation Treaty filings, 2000-11**



Source: OECD (2012e), *Science, Technology and Industry Outlook 2012*, OECD Publishing, Paris.

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increasing participation in international production networks; others have increased the density of their production structure, focusing more on domestic markets, while some, such as China, have done both. By participating in global value chains (GVCs) countries can specialise in specific production activities. Even the success of China reflects the importance of openness to imports and better linkages with other developing countries (OECD, 2013b).

Developing economies are still facing major competitive challenges

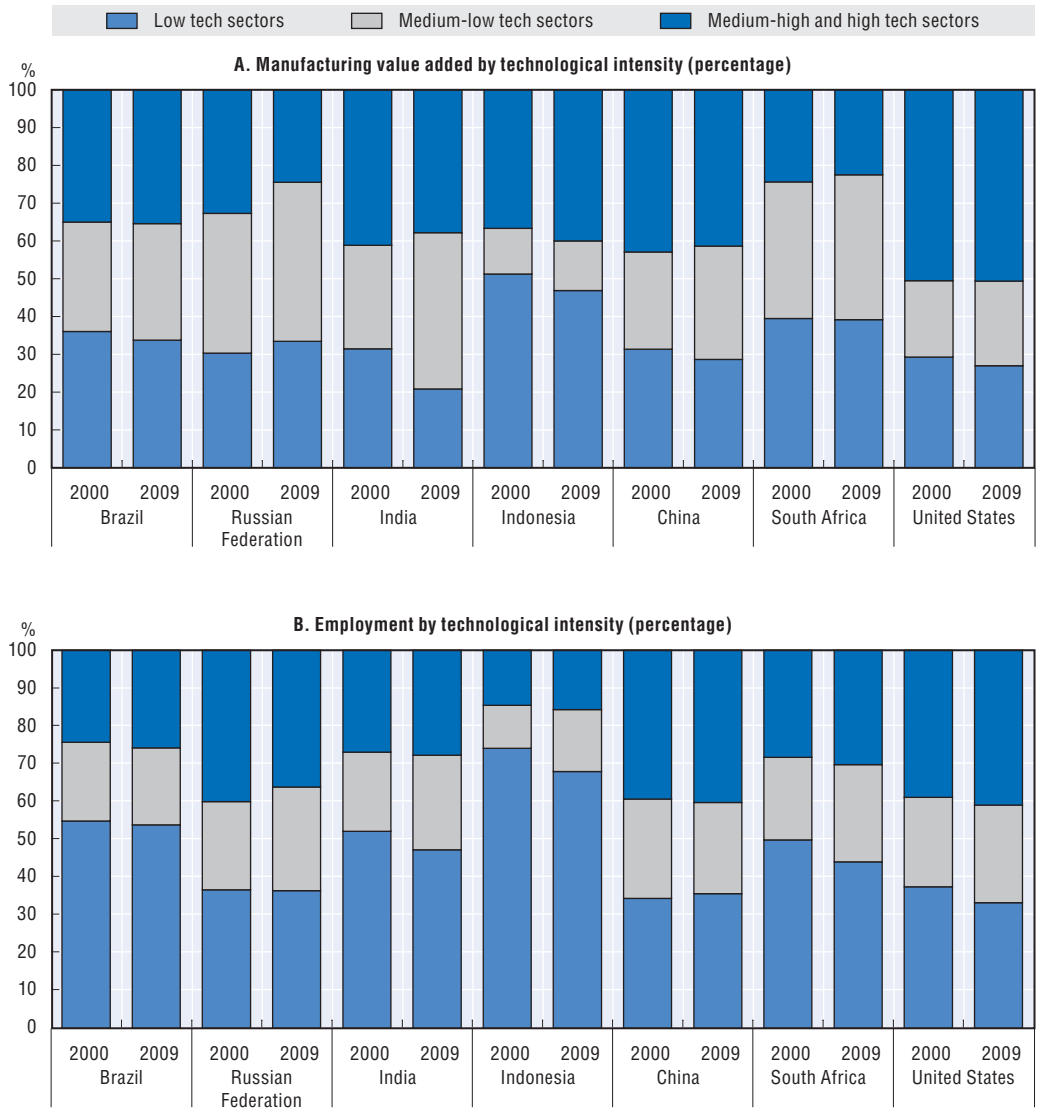
In spite of the significant upgrading and diversification that has taken place in some developing countries, they face major competitive challenges. This section sketches out three of the major challenges that developing economies face to upgrade and transform their production structure. It focuses on: *i)* production specialisation; *ii)* innovation efforts; and *iii)* youth employment.

Despite the changing landscape, developing economies are still specialised in low-knowledge content activities

Countries have shown different capabilities and ways of exploiting the opportunities of the new productive landscape. However, within countries, success is often confined to "islands of excellence", while the rest of the economy operates at much lower levels of intensity of capital and knowledge, or even in the informal sector (ECLAC, 2012; Srinivas, 2012). Some developing economies are diversifying their product mix, shifting from labour-intensive production, such as clothing, to more knowledge-intensive activities, including vehicles, electronics and pharmaceuticals, while other developing economies specialised in natural resource exports are facing obstacles in diversification because of currency appreciation and rising demand for their current exports. More generally, many developing countries are still specialised in activities with low knowledge intensity. For example, in Brazil, China, India and South Africa between 40% and 50% of total employment in manufacturing is concentrated in sectors that are defined as low-tech according to the United Nations Industrial Development Organization (UNIDO) classification.[7] Despite the rise of manufacturing over the last decade, the composition by technological intensity has not greatly changed in developing economies (Figure 3.8).

Activity in services is rising, but emerging economies are slow in becoming major global service providers. China heads the emerging economies for dynamism and share in total world services value added. It accounts for 5% of total world value added in services, on a par with the United Kingdom. The other two emerging economies in the top 20 world services producers are India and Brazil which each account for less than 2% of total world value added, ranking close to Korea (UNStats National Accounts Main Aggregates Database, July 2012). When exports of services are considered, only four non-OECD economies are among the top 20 world exporters: China, India, Singapore and Hong-Kong, China. China's share rose from 0.7% in 1990 to 4.5% in 2010, and India's from 0.6% to 3.3% in the same period (Figure 3.9). In addition, even though China has a comparative advantage in manufacturing, about one-third of the value added of its exports originates from services, relative to an average of around 50% in countries such as France, Germany, the United Kingdom and the United States (OECD/WTO, 2013). Even though they are not yet global services providers, India and Brazil are specialised in exporting knowledge-intensive services. Overall, 75% of total exports of services in India come from knowledge-intensive activities, and in particular from computer and information services. Brazil follows with

Figure 3.8. **Manufacturing by technological intensity, selected countries, 2000-09**



Note: Sectors are classified and grouped according to technological intensity by ISIC, Rev. 3 divisions. Low tech sectors: ISIC divisions: 15-22, 36, 37; medium-low tech sectors: 23, 25-28; medium-high and high tech sectors: 24, 29-35. Data manufacturing value added: Brazil = 2007, India = 2008, China = 2007. Employment data: Brazil = 2007, India = 2008.
Source: Authors' calculations based on UNIDO (2012), *UNIDO INDSTAT2* (database), United Nations Industrial Development Organization Industrial Statistics Database.

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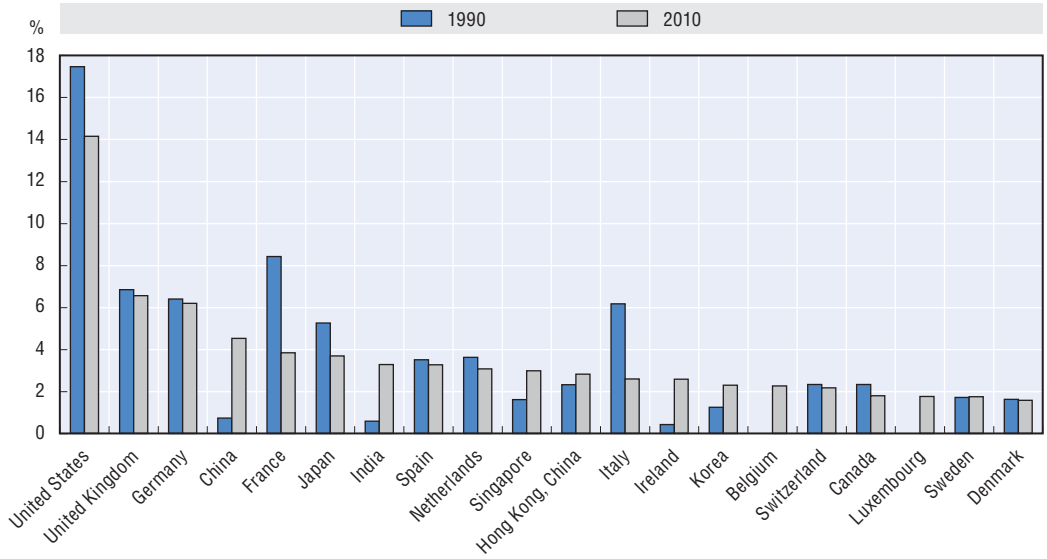
around 65% of services exports in knowledge-intensive activities, half of them in business services. South Africa in turn stands out for its specialisation in services that are not knowledge-intensive, including tourism, which account for 80% of total country exports of services (Figure 3.10). On average, when contrasted with the United States, emerging economies show less diversified export portfolios, mostly concentrated in business services. India is an exception being specialised in computer and information services.

Figure 3.9. **World top 20 services exporters, 2010**

Percentage in total world services exports



Note: Services exports refer to commercial services, which are defined as total services minus government services. 1990 data are not available for Belgium and Luxembourg.

Source: Authors' calculations based on WTO (2012), *Services Profiles Database*, World Trade Organization statistics database, *http://stat.wto.org/Home/WSDBHome.aspx?Language* (accessed October 2012).

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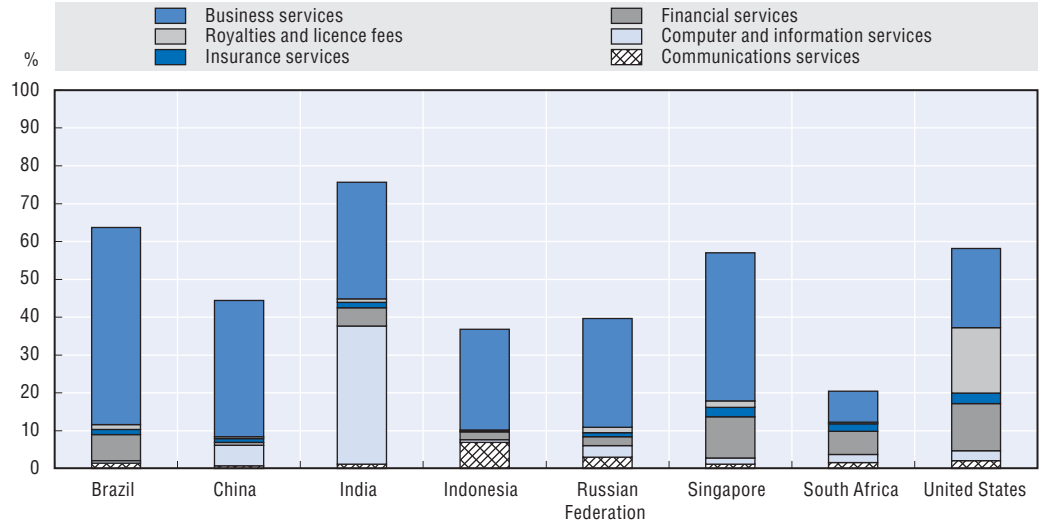
Figure 3.10. **Specialisation in exports of knowledge-intensive services, selected countries, 2010**

Percentage of total commercial service exports



Note: Following the National Science Foundation, commercial knowledge-intensive service exports include business services, royalties and licensing fees, financial and insurance services as well as computer, information and communication services (*www.nsf.gov/statistics/seind12/c6/c6s3.htm*). Data on computer and information services and other business services for India are of 2009.

Source: Authors' calculations based on WTO (2012), *Services Profiles Database*, World Trade Organization statistics database, *http://stat.wto.org/Home/WSDBHome.aspx?Language* (accessed October 2012).

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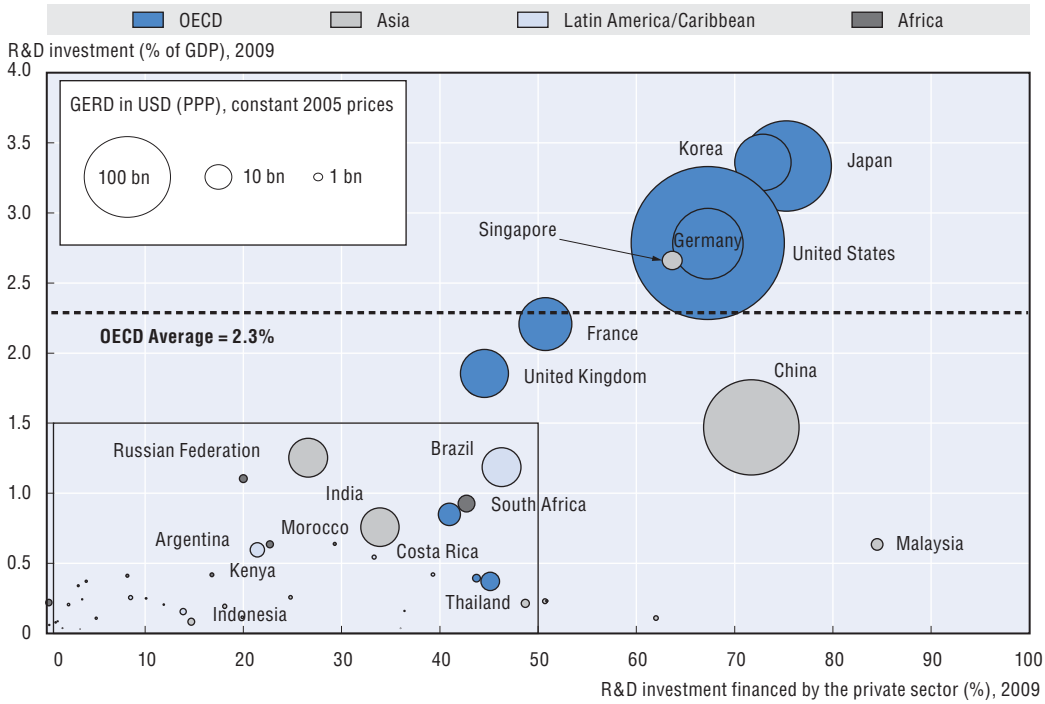
Innovation capabilities are on the rise, but the innovation gap with OECD economies persists

Developing economies are accumulating skills and capabilities for innovation. Emerging economies have increased their investment in innovation activities over the last decades. Investment in R&D is one of the indicators of the commitment towards innovation (OECD, 2012e). In emerging economies this indicator is rising. China more than doubled R&D expenditures over the last decade and in 2009 invested 1.5% of its GDP in R&D (the OECD average for the same year was 2.3%). Brazil increased its investment from 1% in 2000 to 1.2% in 2009. Emerging economies are also becoming attractive locations for research and innovation. For example, they host a rising number of R&D centres, thanks both to public policy support and to new business strategies of transnational corporations. Many companies have opened research labs in emerging markets, including China, Brazil and India, and in growing economies like Costa Rica, Malaysia and Singapore (UNCTAD, 2005; OECD, 2012b). However, the majority of developing countries invest little in R&D; for example, Argentina, South Africa and Morocco in 2009 invested less than 1% of GDP in R&D.

Public, and in particular private, sector investment in innovation, especially in R&D, is low when compared to the performance of OECD economies. Emerging economies still invest significantly less in terms of resources and share of GDP than OECD countries and lag behind, at the aggregate level, in terms of innovation outputs (including patents, trademarks or revenues from innovation). The private sector finances around 35% of total R&D expenditures in India, around 43% in South Africa and 45% in Brazil. On the contrary, the private sector accounts for around 70% of R&D expenditures in Germany, Korea and the US. China, Malaysia and Singapore are exceptions because, even though they still invest less than the OECD average in R&D as a share of GDP, the private sector is the major source of financing, as in most OECD economies (Figure 3.11). In the ranking of the top 1 400 world R&D companies, only 133 (9.5%) are from non-OECD countries, while the remaining 90.5% are from OECD countries. On average companies from non-OECD countries spend half of the amount that OECD companies devote to R&D. This gap is due to various reasons, including the prevailing specialisation of non-OECD companies in sectors generally less intensive in R&D (Figure 3.12).

Developing economies are innovating in business models and in branding, but still lag behind OECD countries such as Germany, the US and the UK. Beyond technological changes, innovation is also introducing new business models, services and customer experiences. Therefore, it can also be achieved beyond formal R&D programmes. Measuring those "non-technological" innovations is a recent effort and few comparable indicators are available. Trademarks have started to be used to compare attitudes towards commercial innovation and intangibles.[8] Applications and registrations for trademarks are on the rise; in 2010, more than 3 million trademarks were applied for and registered worldwide. Applications and registrations at the Chinese Intellectual Property Office explain most of the global increase in trademarks (WIPO, 2011). China ranks today in the top five countries for trademark applications and registrations (Figure 3.13). Applications and registrations are also increasing in other countries, including the Russian Federation, Brazil and South Africa, although on a smaller scale. OECD countries tend to have higher numbers of trademark applications and registrations abroad than at home, while emerging

Figure 3.11. **R&D investment and private-sector commitment in selected countries, 2009**



Note: 2009 or latest available year.

Sources: Authors' calculations based on OECD (2012g), *Main Science and Technology Indicators* (database), *http://stats.oecd.org/* for OECD countries, RICYT (2012), *Red de Indicadores de Ciencia y Tecnologia* (database), Ibero-American and Inter-American Network of Science and Technology Indicators, *www.ricyt.org/* for Latin America and the Caribbean and UNESCO (2012), *UNESCO Institute for Statistics Database*, *www.uis.unesco.org/Pages/default.aspx* for other countries.

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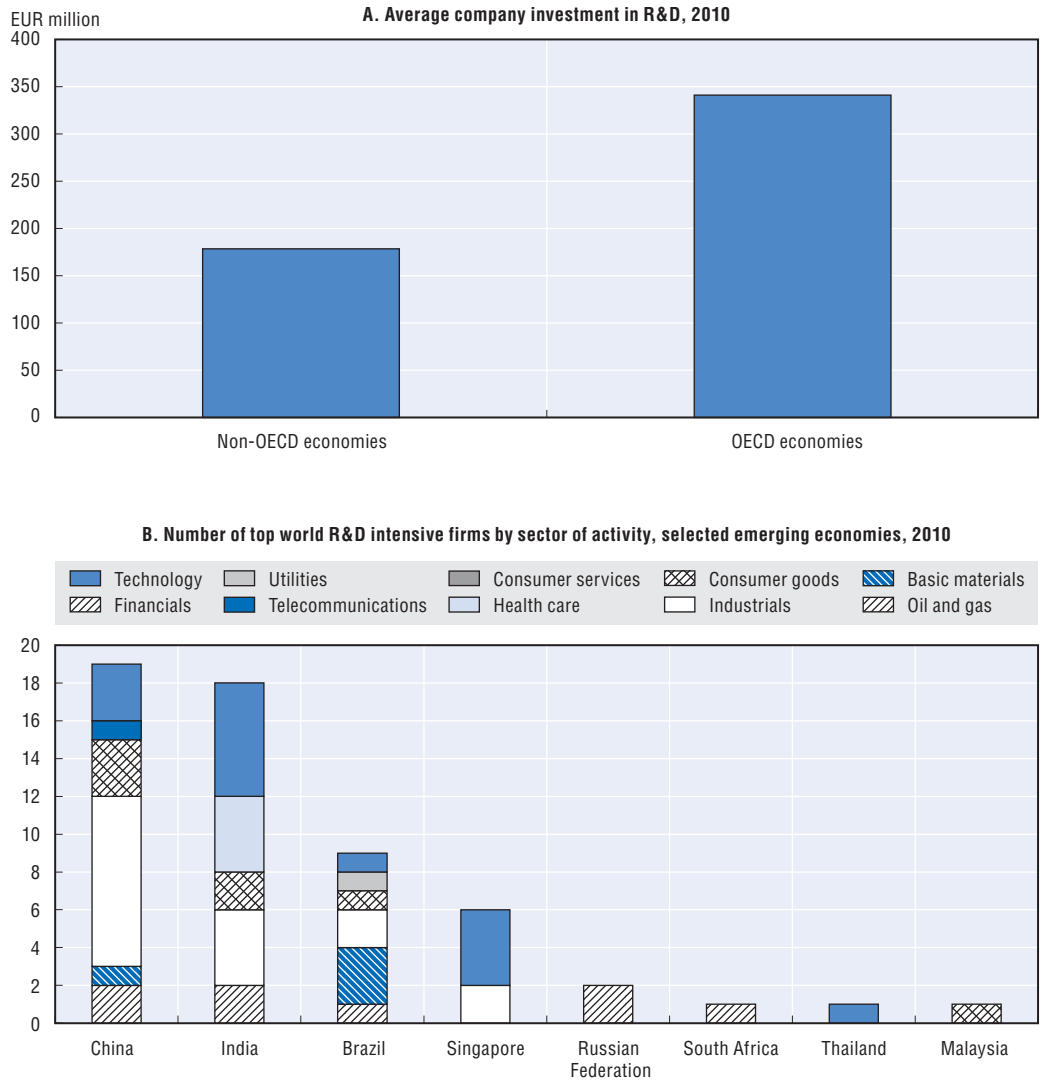
economies generally show the opposite trend, indicating a less global outreach of their innovation activity (WIPO, 2011).

Developing economies are increasingly using FDI to induce learning and backward and forward linkages. However competition to attract high-value-added phases of the production process as well as knowledge-intensive FDI is on the rise as more countries rely on this type of investment to sustain innovation and growth. Thanks to the diffusion of information and communications technologies (ICT) and reductions in transport costs, production remodelling is reaching new sectors, opening up new opportunities to delocalise and participate in global value chains. In the new landscape the factors that influence the location of production and innovation activities are more complex, and are not only related to costs. Local assets, including know-how, quality of institutions for supporting cluster development and the skills base in specific niches and activities will be crucial. This is why strengthening domestic scientific, technological and entrepreneurial capabilities is essential. For example, the partnership between China Railways and GM to develop high speed trains in China has been essential, both for the US company to enter the Chinese market and for the Chinese company to learn how to develop advanced railways. Thanks to this partnership and the associated technology transfer and business learning this Chinese company became the major firm in this sector in the domestic market (McKinsey, 2012).

Figure 3.12. **World top research and development investing companies, 2010**



Note: The 2011 "EU Industrial R&D Investment Scoreboard" collects information on the global top 1 400 companies investing the largest sums in R&D in the last reporting year. Sectors are classified according to the ten main industries by the Industry Classification Benchmark (ICB). Oil and gas includes Oil and Gas Producers' Oil Equipment, Services and Distribution. Basic Materials includes Chemicals, Forestry and Paper, Industrial Metals and Mining. Industrials includes Construction/Materials, Aerospace and Defence, General Industrials, Industrial Engineering and Transport and Support Services. Consumer Goods include Automobiles and Parts, Beverages, Food and Household Goods. Health care includes Health Care Equipment and Pharmaceuticals and Biotechnology. Telecommunication includes Fixed Line and Mobile Telecommunications. Technology includes Software and Computer Services as well as Technology Hardware and Equipment. The number of firms per country depicted may be an underestimate due to the fact that companies are counted by the location of their business registry rather than by the location of their operations.

Source: Authors' calculations based on European Commission (2011), *Monitoring Industrial Research: The 2011 EU Industrial R&D Investment Scoreboard,* European Union, Luxembourg.

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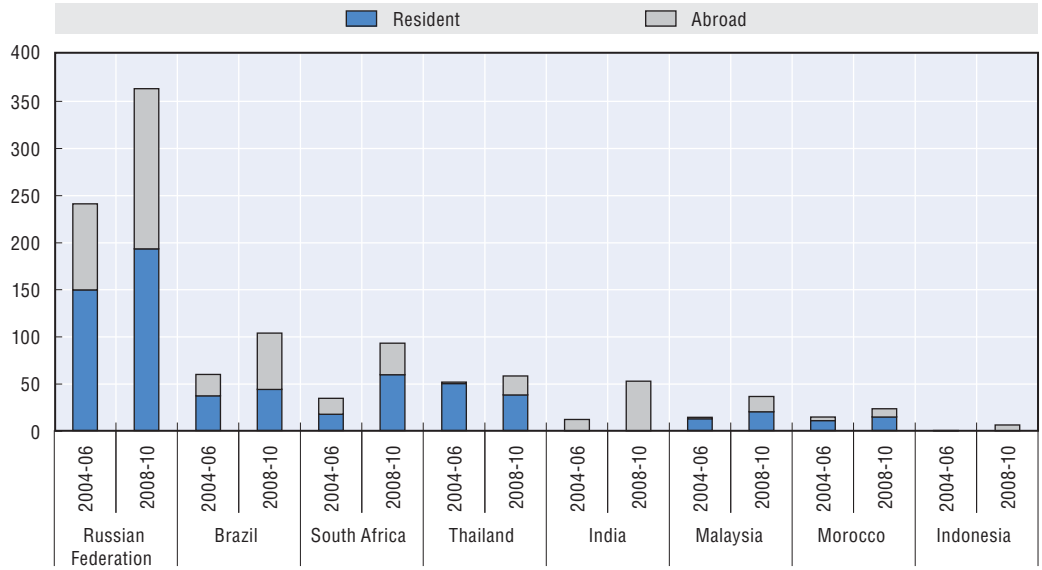
Figure 3.13. **Trademark registrations in selected non-OECD economies 2004-10**

Million registration class counts



Note: Following the WIPO (2011) definition, resident means applications to the country intellectual property office by residents of the country. Abroad indicates trademark registrations outside the country of origin. China refers only to mainland. For Indonesia there were no resident trademark registrations recorded for 2004-06 and 2008-10; 2004-06 registrations abroad totalled 398 and 6 130 for 2008-10.

Source: Authors' calculations based on WIPO (2012), *World Intellectual Property Organization Statistics Database*, *www.wipo.int/ipstats/en/general_info.html* (accessed October 2012).

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A growing young population is an asset, but jobs and skills are major challenges

Developing economies have young and fast-growing populations. Creating employment opportunities will be a major challenge in the short and medium terms (AfDB, OECD, UNECA, UNDP, 2012; OECD, 2012c; Box 3.4). In 2011, Asia accounted for more than 60% of the total world population aged between 20 and 24. This proportion is expected to stabilise around 50% by 2050, compensated for by a rise in the number of young people in Africa, which today accounts for 16% of the total world youth population. Projections indicate an exponential growth of young people in Africa, whose share in the total world youth population is expected to increase to 30% (UN-DESA, 2011).

Creating employment opportunities for the young will require both engaging in the diversification and upgrading of production and the ability to develop appropriate skills and competencies. Developing economies have increasingly educated populations, but they face two major challenges: *i)* to create adequate employment opportunities for the skilled; and *ii)* to train people in skills that are required by the private sector (OECD, 2012b; 2012c; Chapter 5). The skills gap between developing and OECD countries can be measured in various domains, i.e. coverage and quality of education, supply of vocational training and availability of human resources for research activities (OECD, 2012d). New skills will be required not only in science and engineering, but also in technical professions, as well as in the public service, to design and implement better polices. In the group of countries that are actively involved in designing and implementing industrial policies, some are taking new approaches in synchronising skills development with industrial upgrading, among them Brazil, Costa Rica, India and Morocco (see Chapters 4 and 5).

Box 3.4. **Promoting youth employment: A key challenge for African countries**

Africa's rate of growth has outperformed the global rate over the last decade. Yet high growth is not sufficient to guarantee productive employment for all. Large sections of the population, and particularly the young, can be left behind. Young people are not only growing rapidly in number, they are also becoming better educated. Based on current trends, 59% of 20-24 year olds will have completed secondary education in 2030, compared to 42% today. This will translate into 137 million 20-24 year olds with secondary education and 12 million with tertiary education in 2030. Although significant quality gaps remain, these trends offer a new opportunity for development if skills and jobs are created.

Without urgent action to modernise their economies, African countries risk wasting the potential offered by their young people. The International Labour Organization (ILO) estimates that between 2000 and 2008, Africa created 73 million jobs, but only 16 million for young people aged between 15 and 24. As a result, many young Africans find themselves unemployed or, more frequently, underemployed in informal jobs with low productivity and pay. The problem is particularly acute in middle-income countries (MICs). In 2009, in North Africa youth unemployment was 23.4% and the ratio of youth-to-adult unemployment rates was estimated at 3.8.

Source: AfDB, OECD, UNECA, UNDP (2012).

Developing economies are implementing industrial policies

The challenges in the global productive landscape, marked by the rise of China and the growth of emerging markets, are producing new opportunities as well as new challenges for developing economies in their efforts to improve life for citizens and sustain their businesses. To face both, governments in developing countries are showing a renewed interest in industrial policies as part of their development strategies (Box 3.5). This section describes the reasons for such interest and presents an overview of ongoing industrial policy initiatives in developing economies.

Box 3.5. **Defining industrial policies: An operational approach**

The economic literature presents a multiplicity of definitions for industrial policies, ranging from business-friendly framework conditions to more selective incentive packages, including soft and hard infrastructure provision to foster the development of specific industries and/or activities.

The analysis of the experiences of countries shows that industrial policies are country-specific, time-specific and related to the development stage (Peres and Primi, 2009; OECD, 2012a). Beyond the differences, the observation of the experiences of countries in designing and implementing industrial policies helps to define them through an operational approach.

In the context of developing economies, industrial policies are targeted government actions aimed at supporting production transformation that increases productivity, fosters the generation of backward and forward linkages, improves domestic capabilities and creates more and better jobs. This is the result of a co-ordination and sequencing of actions in several fields, including human capital and skills, infrastructure, finance, trade, and science and technology. Industrial policies are often organised as strategies for industrial development. They tend to include both horizontal measures to promote private-sector development, as well as selective policies to foster the development of specific activities or clusters.

Different factors explain the renewed interest in industrial policy

A number of OECD countries and developing economies have engaged in designing and implementing industrial policies as part of their competitiveness strategies. In OECD countries much of the renewed debate on industrial policy has been a response to the 2008 financial and economic crises, even though in some cases it has a more long-term horizon (Box 3.6).

Box 3.6. **Recent initiatives in industrial policy in OECD countries**

Some OECD countries have launched industrial policy initiatives in recent years. Some are direct responses to the economic and financial crisis of 2008, others have a longer-term focus.

In 2008 France established a Strategic Investment Fund to support supply chains and the EUR 35 billion Grand Loan to support strategic investments in commercial spin-offs from universities and research institutes and production development in the digital economy, nano- and bio-technology, renewable energy, low carbon vehicles and innovative small and medium-sized enterprises (SMEs). Japan has recently outlined a new industrial policy plan targeting five strategic areas: infrastructure, environmental/energy problem-solving industries (including green vehicles); culture (fashion, food and tourism), medical and healthcare, and traditional Japanese high-tech sectors (robotics, space, aerospace). Korea, a traditional proponent of active industrial policy, has recently developed sector-specific strategies for its flagship industries: automobiles, shipbuilding, semiconductors, steel, general machinery, textiles and parts and materials. Korea has also identified the priority growth engines for the future in green tech, high-tech convergence technology and value-added services. At the end of 2010, Turkey adopted its Industrial Strategy for 2011-14, aimed at boosting the competitiveness and efficiency of the domestic industry focusing on specific industries with high value-added production. The United States does not have a formal industrial policy but the recently launched innovation strategy includes horizontal measures to improve information and communication technologies (ICT) infrastructure, education, and public services together with a number of selective priorities, in particular: clean energy technologies, biotechnology, nanotechnology, space and advanced manufacturing. The American Recovery and Reinvestment Act of 2009 has included support for energy technologies, housing and other sectoral measures in addition to horizontal and demand stimulus measures.

Source: OECD (2012a).

Since the 2000s industrial policy has also been back on the agenda in developing economies[9] as a result of different factors, including:

- Globalisation and a booming China open up new opportunities but also pose threats to job creation in developing economies and call for more strategic approaches to grasp the benefits of the new scenario (Dahlman, 2011). The rise of China is pushing countries to look at trade and manufacturing from new angles as a result of the changes in the global geopolitical order. Creating and retaining manufacturing and technological capabilities have become more difficult and turned into a priority in developing countries. China has had an impact on different countries in diverse ways. It has boosted the demand for natural-resources exports, thus helping sustain growth in exporting developing economies, but it has also contributed to currency appreciation; it has fostered new

investment flows to the developing world, thereby contributing to the dynamism of African markets and it challenges the survival of low-cost manufacturing in assembly plants in Central America (Chapter 2).

- The 2008 financial and economic crisis reopened a debate on reconsidering the institutions and rules governing the market, in both the financial and industrial domains (Griffith-Jones et al., 2010; Cimoli et al., 2012; Noman et al., 2012[10]). Policies for learning and industrial development cannot be neglected in times of crisis, especially when the global landscape is also being reconfigured by rising uncertainty, new actors and new technological paradigms whose potential has not been fully explored. OECD countries themselves are increasingly concerned about the loss of manufacturing capabilities (Anderson, 2012; OECD, 2012a[11]) and are engaged in foresight exercises to understand the rise of new forms of manufacturing (Box 3.7). The emergence of a shift in preferences on the consumer side and rising general concern about the importance of sustainable development also call for renewed government intervention. Industrial policy can help in channelling resources to orient technical change towards more

Box 3.7. **The future of manufacturing: An issue of rising interest in the United States**

Advanced countries are trying to understand and anticipate changes that could have an impact on the competitiveness of their economies and the well-being of their societies. In 2010, the US government commissioned the Institute for Defense Analysis (IDA) to identify emerging global trends in advanced manufacturing in order to propose alternative scenarios for manufacturing over the next 10 and 20 years. Advanced manufacturing describes new forms of production that "[…] improve existing or create entirely new materials, products, and processes via the use of science, engineering, and information technologies; high precision tools and methods; a high-performance workforce; and innovative business or organisational models" (IDA, 2012).

The IDA report affirms that: *i)* manufacturing has transformed from labour-intensive processes to processes based on advanced technology; *ii)* information and communication technologies are increasingly interlinked with manufacturing processes; *iii)* manufacturing activities increasingly rely on modelling and simulations; *iv)* supply-chain management has increased in speed and flexibility; *v)* manufacturing is converging towards customised production; and *vi)* environmental-friendly solutions are a rising priority in all technological areas.

According to the IDA report, the government can have an impact on the development of advanced manufacturing in different ways, but especially through its support to scientific and technological development, infrastructure upgrading, skills training and regulatory frameworks for new activities. Even though it is too soon to assess the implications of the changing nature of manufacturing, it is possible to anticipate some characteristics of future scenarios. Manufacturing is likely to rely increasingly on ICT and automation; digital supply chain management has the potential to become a standard in firms' management, thereby allowing more rapid analysis and responses in decision making. Countries and companies investing in those capabilities will be better positioned to profit from the increased flow of information. Manufacturing will need to become more efficient in the use of energy and resources, as environmental concerns increase.

Source: IDA (2012).

sustainable practices and fostering its diffusion and adoption (Acemoglu et al. 2012). Although at the global level there is an open debate on sustainable development and on its impact on continuing and future development trajectories, many countries, including developing economies, are investing in sustainable business models and technologies (Mathews, 2012).

- Successful cases of catching up have been associated with the design and implementation of policies to sustain learning and the accumulation of capabilities. For example, Korea and Chinese Taipei followed different models, but both had strong government incentives to foster the development of domestic capabilities. In fact, sustained growth is often associated with the creation of a productive manufacturing base and with tailored government intervention to support it.[12] This is not only true for recent cases, it is also true for traditional OECD countries. Japan, the UK and the US are good examples of the role of the state in supporting industrial development (Reinert, 2007; Block and Keller, 2011; OECD, 2012a). The costs of poor industrial development and innovation have become more visible in the new global landscape. The existence of knowledge-based capabilities is increasingly considered the precondition for grasping the benefits of global markets. The issue is not merely one of being part of the value chain, but of being in a position that allows capturing the most value. In this respect the strategy of China to increase domestic innovation capabilities and to foster learning from FDI is an example (Box 3.8).

Box 3.8. **Strengthening domestic innovation capacities and fostering learning through FDI in China**

The rise of China is due to a combination of several factors. In particular, concerning production, China has been building a complex industrial matrix over time, combining a large domestic market and an open economy, a large supply of workers and the accumulation of domestic technological capabilities, public policies and competition (Dahlman, 2011; Xu, 2011). Policies aiming at strengthening the competitiveness of domestic industry have been, and are likely to continue to be, a central part of the national development strategy. Chinese companies benefit from a mix of public and private partnerships, a strategic management of FDI, active policies to learn from other countries' experiences, joint ventures including technology transfer agreements that favour learning in domestic companies (Van Reenen and Yueh, 2012), and the like. Moreover, China has built up human and financial capital that facilitates linkages and technological spillovers from FDI and is addressing its infrastructural constraints.

It is noteworthy that the government of China seems interested in maintaining and even strengthening its efforts in industrial policies as part of a broader strategy for removing the structural bottlenecks of the so called "middle-income trap". Given the sharp slowdown in population growth and the decline of the investment rate, growth is likely to be more dependent on improvements in competitiveness and in particular on "indigenous innovation" (World Bank and DRC, 2012). Industrial policies may help further in mobilising capital and labour resources that remain untapped, but they will also have to address innovation.

- Growth in developing economies has opened fiscal space for proactive policies which was not available in the 1980s and 1990s. For example, rising revenues from natural resources contributed to discussion on how to channel funds from these activities to

innovation and regional development in Chile, Colombia, Peru and South Africa. In addition, some countries showed a renewed political will to foster structural transformation, such as Brazil and South Africa.

Countries are implementing industrial policies in a variety of ways

Recent developments in the theory and practice of industrial policies show that it is possible to identify some rationales for government intervention through industrial policies (Peres and Primi, 2009; OECD, 2012a). In the context of developing countries, the rationales for government intervention include the reality that market incentives do not always lead countries to specialise in more dynamic or production activities and lock-in phenomena might persist. This is what happens, for example, in countries specialised in mining, where the generation of backward and forward linkages as well as the creation of new activities does not happen spontaneously, unless targeted policies are put in place. Even in developing countries that are more integrated into global value chains and that are aiming to use FDI as a lever for learning and domestic upgrading, government intervention is under way to overcome obstacles, including the provision of adequate domestic skills, infrastructure and local business development. In addition, the components of the industrial policy mix related to scientific and technological development may require targeted intervention to allow the channelling of finance to risky and long-term projects that market-based financing schemes would be reluctant to support, to infrastructure to overcome bottlenecks and, on the incentive side, to support the engagement of businesses and universities in research processes with high externalities.

But the fact that the state has a role to play in fostering the accumulation of technological and production capabilities is not a guarantee of its ability to do it, or to do it well. Designing and implementing industrial policies are not easy tasks, and the risks of failures and capture are high. The experience of the countries engaged, in the past or in the present in designing and implementing industrial policies as part of their strategies show that sophisticated government capabilities are required for the successful management of industrial policies, and this is even truer in global open economies. Even though industrial policy is highly specific to context and time, some lessons can be learned from the experiences of countries that have been engaged in industrial policies, especially with regard to issues that have proved to lead to failure (Box 3.9).

Since the early 2000s, developing economies have started openly to implement industrial policies, including Brazil, Malaysia, Morocco, India and South Africa (Table 3.1 and Box 3.10). China, in turn, has been continuously implementing industrial policies since the 1950s following a particular policy model characterised by a mix of state intervention and strategic opening to global markets. More recently, the country has been prioritising innovation as a key driver for future industrial development. Differences between countries emerge in the policy mix and financial resources devoted to policy implementation, in the governance structure, in the priorities, in the objectives and in the capacity to mobilise the private sector (Table 3.2). In general, Asian economies have proved to be more capable of working with the private sector than those in Latin America and Africa.

Box 3.9. **Learning from the experience of OECD and non-OECD economies in industrial policies**

Many countries at different times in history have designed and implemented, with more or less success, industrial policies to foster production transformation, reconversion or upgrading. In certain cases these policies have been effective in achieving their objectives, but in many others they have failed. Even the success stories include several failures, as countries learn to design and implement policies through trial and error. While it is common to focus on the lessons from success cases, much can be learned from failed attempts. The following points summarise some of the "do not" lessons that can be learned from the experience of OECD and non-OECD economies in industrial policy design and implementation.

- *Indiscriminate subsidies*. Granting subsidies without conditionalities increases the risk of adverse selection of beneficiaries and the development of assistance-dependent behaviour among firms that are often not translated into productivity improvements.
- *Never-ending support*. The absence of sunset clauses in support programmes to companies discourages the necessary efforts to increase their productivity.
- *"Cathedrals in the desert"*. Building factories or research laboratories in remote locations works only when this is part of a broader plan for creating backward and forward linkages, and when it is matched with programmes to foster local infrastructure development.
- *Preventing competition*. While the creation of new activities and industries may require support in early stages (the traditional "infant industry" argument), gradual exposure to internal and external competition can ensure that these activities grow in a productive way.
- *Closed-door bureaucracy-led prioritisation* limits the possibility of generating the information flows and the trust that are essential to get the private-sector commitment to invest in innovation and production development.
- *Capture by incumbents*. Consultations with the private sector often end up being led by incumbents, while innovation and production diversification also depend on the creation and expansion of new firms. Targeted mechanisms to foster the creation of start-ups are needed to avoid the risks of policies that will only help to maintain the *status quo* instead of fostering a dynamic change.
- *Low critical mass for investments* limits the effectiveness of industrial development plans. In addition, if the government contribution is too small, it will not be able to mobilise the matching funds from the private sector.
- *Short-term horizon and annual budgeting*. The creation and strengthening of domestic scientific, technological and production capabilities take time, so industrial policies with short-term horizons and based on annual budgets tend not to be credible. Multi-annual plans and budgets are necessary to mobilise actions and achieve results, but this also requires effective mechanisms for monitoring and evaluation to correct implementation failures.
- *Lack of monitoring and evaluation mechanisms* limits the capacity to generate feedback between policy design and implementation and reduces the effectiveness of policies that evolve through trial and error. In addition, the lack of evaluation limits the possibility of regularly revising the policy to reduce the risks of capture and adverse selection.

Table 3.1. **Recent initiatives in industrial policy, selected developing countries**

Country	Government plans for industrial policy	Main characteristics
Brazil	*Plano Brasil Maior*	Sectoral prioritisation: targeted initiatives for strategic sectors and for traditional sectors that need upgrading and modernisation. Special initiatives for SME development. Special targets for reducing regional disparities. Skills strategy focused on closing the engineering gap. Use of public procurement for innovation. Pivotal role of the National Development Bank (BNDES). High co-ordination with science and technology (S&T) and innovation policy.
China	12th Five-Year Plan 2011-15	Priority shift towards supporting regional development within the country and reducing internal imbalances. Mixed mode of strong public support and private sector development. Strategic management of FDI. High investment in skills, science and technology. Strengthened support towards "indigenous innovation". Use of public procurement for innovation. Direct support to domestic industries and national companies. Strong role of regional governments.
India	National Manufacturing Plan (2012)	Nested in the Five-Year National Development Plan. Matching skills and competences to employer demand. Co-ordination with S&T and innovation policy. Use of public procurement for innovation. Strong focus on FDI and Special Economic Zones (SEZs). Special initiatives for SME development.
Morocco	National Pact for Industrial Development 2009-15	Selection of priority sectors (e.g. automotive, textile, agri-business, aerospace, etc.). Strong focus on FDI and linkages with SMEs. SEZs. Skills strategy linked to the SEZs. (Morocco also has specific programmes for the development of the tourism sector, green development in agriculture, ICT and retail).
Malaysia	Economic Transformation Programme (ETP) for 2020 SMEs Master Plan 2012-20	Priority: sustainable and inclusive growth (New Economic Model). Prioritisation of National Key Economic Areas (Sectoral focus). Targeted initiatives to foster private-sector development. Strong focus on SME development. SME development bank. Leveraging of FDI to upgrade manufacturing. The Economic Transformation Programme (ETP) prioritises monitoring and evaluation of implementation and achievements.
South Africa	Industrial Policy Action Plan 2012/13-2014/15	Sectoral prioritisation: multiple industrial clusters. Focus on the need to align macroeconomic policies with microeconomic policies. Use of public procurement for innovation. Focus on the linkage with trade policy (e.g. infrastructure support for exports, tariff reform, etc.). Green financing. Skills strategy programmes for selected priority areas. SEZs.

Table 3.2. **Key features of industrial policies**

Governance	**Top-down** (Low margin of maneuver of regional/local governments); ex. Chile. **Mixed** (Coexistence of national and regional/local initiatives); ex. China, Brazil. **Bottom-up** (High margin of maneuver and responsibilities of regional/local governments); ex. India.	
Priorities	**Traditional**	**Growth** **Job creation** **International competitiveness**
	Emerging	**Territorial inclusion and competitiveness** **Social cohesion** **Sustainable development**
Objectives	**Diversification** (i.e. entry in new sectors/types of specialisation and upgrading (i.e. scaling up in local and/or global value chains activities) **Increasing the density of the production system** (i.e. fostering entrepreneurship, linkages)	
Policy mix	**Industrial policy tools** (i.e. direct and indirect incentives to firms) **Trade policy and FDI** **Support to science and technology** **Skills development**	**Infrastructure building and upgrading** **Financing** (i.e. development banks) **Macroeconomic policy** (i.e. exchange and interest rate management) **Competition policy**

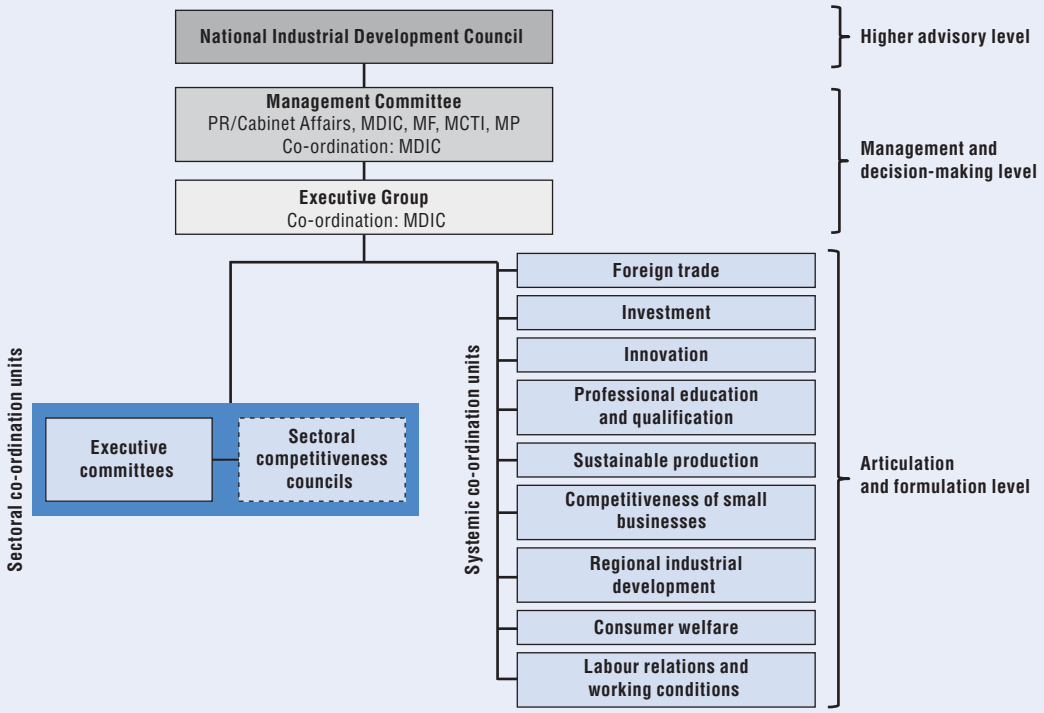
Box 3.10. **Recent experiences in industrial policy: Brazil, South Africa and Morocco**

In Latin America Brazil has been a pioneer: in 2003 it re-launched industrial policy with the industrial, trade and technology integrated policy for 2003-08 (PICTE). During this period Brazil created the National Council for Industrial Development (CNDI) and the Brazilian Agency of Industrial Development (ABDI) to increase policy co-ordination and foster dialogue with the private sector. In 2008 the country launched the Production Development Policy for 2008-11 that included incentives to strengthen existing sectors and create capacities in strategic areas. Building on this policy, in 2011 the government introduced the *Plano Maior* (Coutinho et al. 2012). Industrial policy in Brazil has a well-articulated governance structure fostering co-ordination among different ministries and levels of government (Figure 3.14). The plan aims to enhance productivity and innovation and expand the domestic and external markets while at the same time ensuring social cohesion and territorial inclusion. The plan has targets in different areas, including: *i)* increasing R&D, manufacturing value added, the share of knowledge-intensive manufacturing on total manufacturing and the skills base; *ii)* developing national energy markets and supporting sustainable technologies; and *iii)* fostering SME development and promoting innovation for social development. In parallel, the government is actively involved in improving infrastructure.

In South Africa a serious commitment to re-launch industrial policy was made in 2007 with the introduction of the New Industrial Policy Framework (NIPF). The key challenge for the country is to foster diversification and to favour the development of activities in sectors beyond the mining cluster. South Africa has learned that opening the economy and attracting FDI have not been enough to encourage production development. Today the country recognises the need to implement targeted incentives to create domestic industrial capabilities and to co-ordinate actions to strengthen the skills base and the scientific capabilities (Zalk, 2012). South Africa is prioritising some sectors that are medium-high value added and with potential for employment generation, including agro-processing, vehicles, textiles and green energy. The policy has a well-articulated governance structure that prioritises dialogue between government agents and private-sector stakeholders, as well as with civil society and universities. It involves a greater role for the national development bank (Industrial Development Corporation, IDC),[1] which manages funds for innovation, including the Technology Venture Capital fund. It also benefits from rising collaboration between the Department of Trade and Industry and the Department of Technology and Innovation (Baloy, 2012).

Box 3.10. **Recent experiences in industrial policy: Brazil, South Africa and Morocco** *(cont.)*

Figure 3.14. **Industrial policy governance, Brazil's *Plano Maior*, 2012**



Source: Kupfer, D. (2012), "Industrial Policy for Development: Who is Doing What? Rationale, Challenges and Policies Applied in Brazil", presentation at the OECD Development Centre Expert Meeting on Sustaining Growth in a Context of Shifting Wealth: What Role for Industrial Policy?, Paris, May.

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Morocco launched an initiative for industrial development in 2005. The strategy is based on two pillars: *i)* supporting the existing local industrial structure; and *ii)* creating incentives for entry into new sectors in which Morocco could develop competitive advantages. It includes investment for creating infrastructure and platforms for industrial development as well as targeted initiatives for skills upgrading. The priority sectors include automotive, aeronautics, agribusiness, off-shoring and textile. The National Pact for Industrial Development 2009-15 provides details for the development of each industrial cluster. Morocco aims to use FDI as a lever to foster production upgrading. SEZs are planned in regions to make the establishment and operations of foreign investors easier. The country is also actively engaged in identifying mechanisms to clarify skills requirements and put in place short and medium-term actions to bridge the skills gap. Partnerships with foreign companies are helping to train technical and professional workers.

1. The IDC manages several horizontal and sector-specific funds. So far, the combined size of the committed resources to the cross sectoral funds and the sector-specific funds is ZAR 5.4 billion (USD 624 million) and ZAR 1.4 billion (USD 168 million) respectively (IDC, 2012). The figures refer to the amount of funding committed as of 31 March 2012. Exchange rate: 1 USD = 8.59 ZAR.

Industrial policies face new common challenges

Industrial policy today faces new challenges.[13] The new productive landscape is characterised by: *i)* increasing relevance of local, regional and international networks for production and innovation; *ii)* a higher speed of diffusion of information; and *iii)* greater mobility of capital and talent. New forms of production organisation are changing the ways

in which companies, and hence countries, can build their competitive advantages. At the same time, big emerging markets have realised the relevance of domestic demand as a source of growth, in addition to export-led strategies, also in line with the rising priority of social cohesion in their development agenda (OECD, 2011a). Countries are also implementing industrial policies in a new global landscape where some instruments commonly used in the past are no longer well accepted; in addition, industrial policies need to identify mechanisms to engage with foreign investors operating in the country as well as nationals investing abroad. The setting is more complex and therefore requires stronger institutions.

To address these challenges, developing economies generally view upgrading production and increasing the knowledge content of exports as necessary conditions for sustaining growth and achieving development. In particular, even though each country follows a different approach, there is consensus in a number of areas:

- Policies work better when they follow a focused approach related to specific technologies and markets (sectors, clusters, industrial districts, etc.) and when they differentiate by target (for example by addressing SMEs).
- Countries increasingly put in place selective instruments. They have started to prioritise emerging industries with the potential to have an impact on other production sectors, including biotechnology and ICT.[14] Some countries offer incentives to create scientific and technological capabilities in key areas, as in Brazil, India and Malaysia; others introduce the selective dimension by prioritising industrial clusters, as in Morocco, and/or SMEs as in Malaysia. Many countries (e.g. China, India and Morocco) use SEZs to bridge infrastructure gaps and offer facilities for industrial development; however the impact of SEZs is mixed when their capacities to create domestic backward and forward linkages are assessed (Srinivas, 2012). Often countries develop skills strategies to create technical and managerial capabilities, preventing brain drain, attracting the knowledge diasporas, and promoting learning through mobility of talent (OECD, 2012d).
- Private-sector commitment is paramount and spaces for public-private dialogue are needed for the setting of priorities and policy follow-up. Countries are investing in creating incentives to foster information flows between the private and the public sectors to improve the capacity to prioritise actions. However, in this respect countries are aware of the risks of capture by established interests and of the difficulties in involving in the consultations new and small businesses. Countries are increasingly recognising the importance of establishing targeted mechanisms to promote the creation of start-ups and new firms, which can be important vehicles for job creation and for innovation dynamism. Effective policies are constantly revised to effectively manage rents and reorient the scope and nature of interventions on the basis of the attained results (see Chapter 4).
- Efforts are required to mobilise FDI that fosters learning and production development in the local economy and has strong backward, forward and territorial linkages.

The experiences in terms of governance in developing economies are of specific interest. They tend to suggest that:

- *Industrial policies should have a long-term perspective, often involving actions at different levels of government. Some countries define their industrial policies in national plans by setting targets and defining lines of action.* This is the case in most East Asian economies, as well as in Brazil, Morocco and South Africa. However, even in countries where there is no formal industrial policy plan, the government influences industrial development through a series of initiatives that shape the environment in which production development takes

place. Industrial policy often has a strong regional and/or local component. In some countries there is a prevailing bottom-up approach where most competences at the level of industrial and technological capabilities are managed at the sub-national level. India is a case in point. Other countries follow a more top-down approach with a reduced margin of manoeuvre for regional and/or local authorities, as in South Africa. In other cases (e.g. China and Brazil) national initiatives coexist with regional actions.

- *Industrial policies should be part of broader competitiveness strategies exploiting synergies among related policies.* Industrial policy shows high levels of complementarities with other policies. Most of the outcomes of industrial policy are the by-products of a series of synergies (or lack of them) between government actions and "bundles" of investments. The creation of new production activities requires a series of actions to be put in place in a co-ordinated manner, including macroeconomic policies in line with production transformation objectives. Since the 2000s developing economies have fostered dialogue between public and private actors (for instance, by creating Presidential Councils for Competitiveness as in Chile and Costa Rica), as well as new forms of collaboration between national and territorial actors, as in Brazil, China and India. However, those initiatives are not always backed up by sufficient resources and political will, or lack a clear identification of priorities in terms of targets and timing. The Korean success is a good example of the ability to identify priorities, set targets and achieve them through a combination of well aligned policies (Box 3.11).

Box 3.11. **Multi-annual planning and industrial policy in the Korean catching up strategy**

From 1962 to 1992, the Korean government established seven consecutive five-year economic development plans to support the creation of domestic capabilities, by setting clear targets and by orchestrating actions across fields, including industry and technology, trade, education and infrastructure. Each of the plans identified key objectives, introduced selective policies and directed resources to achieving them. A major characteristic was the gradual upgrading of targets in the different planning periods. During the first decades, priority was given to import substitution policies. As domestic capacities were built and the country strengthened its manufacturing capacities, the government prioritised export-oriented policies. A key role was assigned to the national conglomerates (*chaebols*).

The government supported heavy and chemical industries by combining different policy approaches: providing subsidised long-term credits and tax incentives to selected industries; establishing vocational schools for training the labour force; creating government-led research centres; and controlling imports with a list of goods classified as allowed, restricted or banned according to their domestic availability. In addition, the government supported the export orientation of those industries by combining different policy instruments, including export credits, and by offering support to exports through institutions such as the Korea Trade Investment Promotion Agency (KOTRA). The government also used intervention in the domestic capital market to channel resources to targeted industries and developed a system of specialised banks to provide credit to specific industrial activities (including the Korean Development Bank and the Industrial Bank of Korea).

Liberalisation of imports started only in the 1980s. Since then the government has emphasised the transition towards a development model led by the private sector. Export promotion was particularly intensive. However, in parallel with export promotion, the government maintained controls over imports. Korea has gradually embraced an open economy policy and shifted to a free trade regime in 1995 when it entered the World Trade Organization (WTO).

Source: OECD (2012c).

- *Industrial policies should be tools of general development strategies.* Industrial policy is increasingly called upon to address new priorities and often has multiple objectives. Countries today do not only pursue growth and job creation. Growth must be accompanied by territorial inclusion and social cohesion to achieve development (ECLAC, 2012). In addition, industrial policy in developing countries includes incentives to shift towards new production and consumption patterns in line with the shift in preferences and rising relevance of sustainable development. Some industrial policy actions aim at diversifying the production structure, helping create capacities in new economic sectors (e.g. electronics, pharmaceuticals or biotechnology) or in new types of activities (e.g. design, R&D, value-added services). Other actions seek to promote specialisation and the upgrading of existing activities and sectors. This means favouring modernisation of production, increased efficiency and improved performance by existing companies, clusters or sectors. But industrial policy also aims at strengthening entrepreneurship, networks and collaborations, on the basis of the recognition that denser systems are more resilient, innovative and productive. In general, countries put in place articulated strategies that tackle the three objectives at the same time. This also implies including specific policies to address the drawbacks of informality (Box 3.12).

Box 3.12. **Addressing informality is a pending challenge for industrial policy: Insights from India**

Informal employment refers to jobs or activities in the production and sales of legal goods and services which are not regulated or protected by the state. In developing countries, approximately 55% of all jobs in the non-agricultural sector can be considered informal. In some regions, including sub-Saharan Africa and South Asia, this rate reaches at least 80% (OECD, 2011a). India is no exception to the rule. High GDP growth rates over the recent past have not translated into high growth in formal employment. A huge informal economy has supported the rise of services in India. Approximately 93% of India's labour force exist in organisational contexts that differ from the traditional stakeholders for whom industrial policy is designed (Srinivas, 2012).

India's new industrial policy, launched in 2011, needs to take into account the specific challenges associated with a large informal economy (i.e. low capital intensity, skills, productivity and margins), given its strong linkages with formal manufacturing and service activities (i.e. in many industrial clusters informal workers are vital parts of value chains). Enabling small and micro firms, in particular, in the informal economy to access more skilled workers, finance, and technology can improve productivity and employment.

In 2004, the Indian government established an advisory body (the National Commission on Enterprises in the Unorganized Sector) to identify policy recommendations to address the challenges associated with the informal economy. In 2009 the commission released a report recommending the creation of local focal points to monitor the productivity and competitiveness of enterprises in the unorganised sector and the establishment of Technological Innovation and Dissemination Centres in each state. The explicit integration of the informal sector into industrial policy is noteworthy. Until very recently economic policies in India had little place for the informal economy.

Source: OECD (2011a) and Srinivas (2012).

- *Each country has its specific governance arrangement, but in all cases a clear gatekeeper is required to co-ordinate the actions of the different actors involved.* The institutional setting of each country shapes the process of policy design and implementation. In some countries the principal ministry is the Ministry of Trade and Industry, as in South Africa where the main body is the Department for Trade and Industry (DTI), in others it is the Ministry of Industry in partnership with the National Development Bank and the Ministry of Innovation, as happened in Brazil. In Malaysia, for example, the key institutions are the Malaysian Industrial Development Authority (MIDA), which is in charge of attracting FDI, and the SMEs Corporation.[15]Beyond the variety of arrangements, in all countries industrial policy is managed by a series of institutions which operate in the areas of industry, trade, science and technology, and innovation. Recently, development banks have regained responsibilities in implementing policy (see Chapter 6). In addition, almost all countries have created new spaces for dialogue among different stakeholders; competitiveness councils are often composed of ministries, representatives of the private sector and members of academia and civil society.
- *Countries are also identifying new sources of financing for industrial policy.* To mobilise investment in bundles industrial policy needs both strategic thinking and planning capacities in governments, as well as resources to finance and support the different programmes. The low level of fiscal revenues of developing economies relative to OECD countries challenges their capacity to reach a critical size in mobilising public investment. Developing countries are finding new mechanisms for industrial policy which include: a higher involvement of development banks in fostering innovation and production development (e.g. Brazil and South Africa); strategic partnerships with multinational companies (MNCs) (e.g. Costa Rica and Malaysia); and mobilisation of the private sector, for example in the areas of venture capital and business angles (e.g. China and Brazil).

Conclusion

This chapter has discussed the renewed interest in industrial policy in developing economies. The changes in the global productive landscape, marked by the rise of China, demands from new "middle classes" and the growth of emerging markets call for new policy approaches to sustain growth and create jobs in developing economies. Many countries, including Brazil, China, Malaysia, Morocco, India and South Africa have introduced policies to promote structural transformation. Those policies differ from past industrial development strategies because countries today face: *i)* a new open economy context that requires using new policy tools; *ii)* higher pressures to show the impacts and results of public action; *iii)* new forms of organisation of production and innovation at the global and local level; and *iv)* the need to achieve structural transformation while guaranteeing, at the same time, social cohesion and territorial inclusion.

The new landscape poses opportunities and threats that are specific by country. Common challenges in policy design and implementation for developing countries are: prioritising and sequencing of actions, avoiding lock-in and capture, getting the private sector on board and identifying adequate and long-term sources of financing (see Chapters 4, 6 and 8). From the experience of countries it can be observed that industrial policies work better when they are nested in the broader national development agenda, have clear targets and are able to co-ordinate investments in bundles and take into account the specific features of the territories where they are implemented (see Chapters 5 and 7).

Industrial policy is not an area of easy consensus, either within governments or in international policy and economic circles. However, the complexity of the new global economic landscape and the trends in developing economies suggest that policies to foster production structure transformation and industrial development are crucial to sustaining growth and creating better jobs. Even though there is no unique model, some lessons can be learned from the experience of countries that in the past and in the present have engaged in these types of policies. Instead of focusing on an ideological debate for or against industrial policy, it is worth getting into the details of the "what to do" and the "how to do it" in order to increase the effectiveness of the policies that countries are implementing as part of their strategies (see Chapter 8).

Notes

1. The term "capabilities" here refers to the ability to create, acquire, use or adapt technological knowledge to develop new products and processes.
2. Griffith-Jones et al., 2010; Cimoli et al., 2009a, 2012; ECLAC, 2012; Noman et al., 2012.
3. These figures refer to data for Quarter 1 to Quarter 3 of 2012.
4. China today accounts for 2.7% of total patents granted to non-US residents. This performance is more remarkable when compared with that of India which was obtaining more patents than China in the 1970s but now only accounts for 1% of total US patents granted to foreign inventors, but is far less impressive when contrasted with Korea. Korea was also a marginal actor in global technology markets in the 1970s, but today accounts for 10.6% of total US patents granted to foreigners (a share which is slightly superior to that of Germany).
5. The share of non-OECD countries in total world manufacturing value added including China rose from 18% in 1990 to 39% in 2010.
6. China, Brazil, India, the Russian Federation, Indonesia, and Thailand are the emerging economies among the top 20 global manufacturers (Figure 3.1).
7. UNIDO classifies manufacturing sectors [ISIC D (15-37), Rev. 3] on the basis of their technological intensity (R&D expenditures divided by production or value added). It follows and slightly adjusts the standard OECD classification of manufacturing industries based on R&D intensity.
8. Trademarks are legal mechanisms to protect the brand and the image of companies. On average, at the country level, their use is correlated with technology-related innovation indicators, including R&D and patents. However, at the firm level they can reveal different innovation modes and strategies (OECD, 2010b).
9. On the return of industrial policy to the development agenda see, among others: Rodrik, 2004, 2008; Pack and Saggi, 2006; UNCTAD, 2006; Chang, 2011; Lin and Chang, 2009; Cimoli et al., 2009a; Peres and Primi, 2009; Peres, 2009; Devlin and Moguillanksy, 2010, 2012; Naudé 2010; Günther and Alcorta, 2011; Zalk, 2012; ECLAC, 2012; Lin, 2012; Noman et al. 2012; OECD, 2012a.
10. For an analysis of the impact of the economic crisis on the development agenda and the call for a renewed role of the state see also Deshpande and Nurse, 2012;
11. For additional evidence on new manufacturing see also IDA, 2012.
12. On the successful catching up cases based on strengthening manufacturing capabilities and the roles of government see, among others Amsden, 1989; Wade, 1990; Chang, 1994; 2006; Reinert, 2007; Cimoli et al., 2009a.
13. On the return of industrial policy and the new policy spaces and challenges see, among others: Cimoli et al., 2009a, 2009b; Peres, 2009; Peres and Primi, 2009; Devlin and Mogluillansky, 2010, 2012; Lin, 2012; Noman et al., 2012.
14. For example biotechnology has direct relevance for several production activities, from pharmaceuticals to food.
15. For a review of industrial policy in Malaysia see Sundaram (2007).

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Chapter 4

Emerging issues in implementing industrial policy in developing economies

This chapter sketches out some of the major issues that developing economies face in implementing industrial policy in the new global economic landscape. It highlights that: i) empowered institutions and performance-based incentives help to deal with the risks of capture; ii) promotion of innovation, start-ups and cluster development are increasingly used as mechanisms to support production upgrading and transformation; iii) empowering regions increases the effectiveness of industrial policy; iv) sustainable development opens opportunities for developing countries, but specific policy measures are needed; v) monitoring and evaluation mechanisms need to be in place to improve policy implementation and design.

Introduction

Since the early 2000s several developing economies have been actively engaged in designing and implementing industrial policies to foster structural transformation. Developing countries follow different approaches to industrial policy, reflecting their institutional capabilities, endowments and strategic choices (see Chapter 3). Unlike in OECD countries, the renewed interest in industrial policy started before the economic and financial crisis of 2008. The phenomenon of "shifting wealth", and in particular the high growth rates caused by rising prices of raw materials in the 2000s, and a growing political will in developing economies for structural transformation, contributed to creating the conditions for rehabilitating industrial policies.[1] However, the global economic slowdown and the increasingly competitive landscape are forcing developing countries to manage resources better and to achieve tangible results in the short term, especially in terms of job creation or retention.

Developing countries are concerned not only with policy design, but also with better managing policy implementation. They have learned, from their history and from the experience of others, that having an explicit and declared industrial policy is not enough to make the difference in terms of implementation and impact. What also matters is the capacity to mobilise actions on several fronts, including skills, infrastructure and finance. A major challenge for developing countries is how to prioritise actions and select areas of intervention with the highest potential impact.

This chapter identifies five major issues in implementing industrial policies in developing economies in the current global economic landscape. The first section discusses the risks in implementing industrial policy, focusing on lock-in and capture. The second focuses on the mechanisms that developing countries can use to promote upgrading and diversification. The third shows the increasing relevance of adopting the regional perspective in industrial policy and highlights recent trends in this field. The fourth section discusses the issue of sustainable industrial development and the fifth focuses on the mechanisms to monitor implementation and evaluate impact. The sixth section concludes.

Avoiding lock-in and capture

Developing countries are increasingly concerned about the implementation of industrial polices. Countries are aware that having an industrial development plan, or a declared industrial policy, is no guarantee of success. That depends on a good plan, the resources to implement it, long-term commitment and implementation capabilities. It also requires the ability to reorient actions when results are not achieved and to create permanent spaces for dialogue with relevant stakeholders (including firms, universities and civil society).

There are strong interests operating against change in developing economies. For example, rising prices of raw materials have increased rents in traditional sectors to levels

that are higher than in more technologically advanced sectors. Capture by vested interests often undermines the capacity of governments to make the right choices. In this setting, market incentives to engage in new activities will not be high, unless government intervention supports diversification and upgrading. At the same time, the risks of failure in implementing industrial policies are high. Information asymmetries and uncertainty can reduce state planning capacities.[2] In addition, governments face obstacles in quickly fine-tuning actions, and withdrawing support when it is not needed is difficult because lobbies will try to prevent changes in the existing scheme (Krugman and Obstfeld, 1991). Another challenge for governments is to achieve internal consensus on industrial policy; ministries of finance have been particularly sceptical about increasing government spending on issues related to production structure. High level political will to engage in industrial policies is needed to ensure the required co-ordination of government actions.

Empowered institutions and performance-based management schemes help in dealing with the risks of capture**.** Granting rents to certain agents, groups or sectors creates possibilities of capture and lobbying. But, in the absence of state intervention, rents are captured anyway (Khan, 2000; Khan and Blankenburg, 2009). A country engaged in an effort to strengthen its technological and production base will need to build alliances with the business sector and with the institutions engaged in innovation. Mechanisms to align actions and balance interests are therefore needed. However, even in cases where institutions are well endowed, and all the incentives are in place to prevent capture and lock-in, it is possible that, in the short term, the country does not achieve the expected results. Public support may go to research institutes which struggle to transfer technology to the private sector or resources may be invested in activities that will not develop as expected. Those failures are part of development processes. Even successful countries have made those errors, but were able to correct their policies and adjust the implementation mechanisms to achieve targets; Korea is a case in point (Suh and Chen, 2007; OECD, 2012a).[3]

Promoting upgrading and diversification

Promoting the transformation of production structures by increasing the competitiveness of existing firms, by supporting the creation of new firms and by entering into new sectors and activities is one of the major challenges for industrial policy in developing countries (Box 4.1). This section describes three main ways through which developing countries are promoting production upgrading and diversification: *i)* fostering innovation, using public procurement and foreign direct investment (FDI); *ii)* promoting the creation of new firms, especially start-ups; and *iii)* encouraging the development of industrial clusters.

Fostering scientific and technological development and innovation

Developing countries are reducing the gap between innovation and industrial policy that prevailed in the 1990s and in the early 2000s (Cimoli et al. 2005; Soete, 2007). Domestic scientific and technological capabilities are essential for entry into new sectors and the development of new activities. In Brazil, since 2003 industrial policy has been closely allied to the innovation agenda. The Ministry for Science, Technology and Innovation implements several programmes which are aligned with the industrial development priorities. At the same time, the National Development Bank (BNDES) has set innovation as a key area for intervention. India recently introduced a new technology fund to support

Box 4.1. **"Comparative advantages" and structural transformation: An open debate**

The capacity of the state to select sectors, technologies and activities has been extensively debated.[1] Among those who recognise that the state has a role to play when it comes to promoting upgrading and diversification, differences emerge with respect to "what to select" and "how to do it". Some argue that for each stage of development each country should identify the areas that should be promoted in line with potential comparative advantages. Countries need to be very careful about selecting options that are too "distant" from their capabilities (Hausmann and Rodrik, 2006; Lin, 2012). Others maintain that it is precisely by deviating from the existing comparative advantage that countries can develop. Market incentives induce specialisation in activities with lower knowledge content and targeted policies are needed to support a transition towards superior specialisation patterns (Amsden, 1989; Wade, 1990; Chang, 1994; Reinert, 2007; Cimoli et al., 2009).

The evidence from modern successful catching-up stories shows that economic development is associated with changes in specialisation and trade patterns and with growing domestic technological and innovation capabilities. Finland, Korea and China are cases in point. Development and structural transformation require gradual accumulation of capabilities and learning, in both the private and public sectors. Often there are no "natural" reasons explaining why some countries (or regions) are good at producing or trading certain goods; usually they have accumulated capacities and know-how and put in place systems to support learning and the development of specific industries and related competences. In addition, every time that a nation has been able to become a global leader in one field, it has done so by mobilising actions on several fronts, including science and technology, skills, finance and infrastructure.

1. See, among others, Krueger, 1990; Chang, 1994; Lin and Chang, 2009; Cimoli et al., 2009; Lin, 2012; OECD, 2012a; OECD, 2012b.

innovation in firms. In South Africa, the Industrial Development Corporation (IDC) finances venture capital and innovation in small and medium-sized enterprises (SMEs), while the National Research Foundation has programmes to foster skills and technological development for industrial upgrading. In spite of the number of activities, the level of investment in innovation is still low, both with respect to the overall industrial budget (in South Africa, for example, innovation programmes account for around 6% of the total industrial policy budget), and in comparison with the amount of investment devoted to research and development (R&D) and innovation by more advanced countries (the US invests yearly around USD 1.75 billion for the nanotechnology initiative alone, while the investment of Brazil for the sectoral technology funds is around USD 985 million).

Several developing countries are giving priority to targeting support to specific scientific and technological areas. China, for example, is investing in research in new materials, biotechnology and clean energy vehicles. Brazil is prioritising research in strategic areas, including energy, healthcare, biotechnology and climate change. Sectoral technology funds are increasingly used to channel resources to innovation and to favour collaborative programmes between firms, universities and research centres. Brazil has been a pioneer in this field: its system of sectoral technology funds was introduced in 1999 (Box 4.2). Developing economies often implement a broad set of instruments to support innovation in addition to fiscal incentives and targeted financial support to R&D. Like

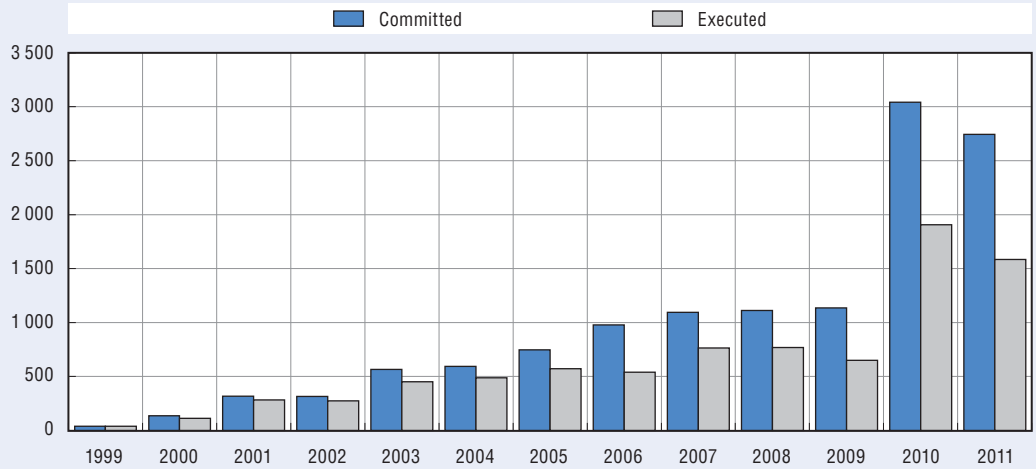
Box 4.2. **Promoting innovation in Brazil: Sectoral technology funds and the BNDES card**

In 1999, Brazil introduced a system of sectoral technology funds to finance scientific and technological development. It is based on the creation of several sectoral funds (12 at the start, now 14) and two transversal funds for innovation. Each fund is financed by channelling specific rents from each sector to the federal fund; in addition, a percentage is channelled to the transversal funds to finance improvements in R&D infrastructure and co-operative R&D projects between universities and firms. Each fund is managed by a committee composed of members from the Ministry of Science, Technology and Innovation, other sectoral ministries, regulatory agencies, the scientific community and the business sector. Brazil has funds for all major sectors, including oil and gas, biotechnology, energy, information and communication technologies and health. This system represented an innovation in the existing mechanisms to finance scientific and technological development. Even though it entails complex management schemes that require co-ordination between government, private sector and academia, it overcomes the limits of incentive schemes designed to follow only a supply-side or a demand-side approach (Cimoli *et al,* 2005). The resources invested through the sectoral technology funds have increased over the years (Figure 4.1).

Brazil has also introduced new schemes to promote innovation in small firms. For example in 2003, the National Development Bank (BNDES) introduced a new card that gives micro and small enterprises direct access to government credit lines. The new instruments also tend to be broader and include support to human capital, infrastructure, finance and business services as well as access to knowledge.

Figure 4.1. **Budget for sectoral technology funds in Brazil, 1999-2011**

Million Brazilian reals (BRL)



Sources: OECD (2011c), "Hacia un mecanismo para el diálogo de políticas de innovación: oportunidades y desafíos para América Latina y el Caribe", OECD Development Centre, OECD, Paris and ECLAC and SEGIB (2010), *Espacios Iberoamericanos: vínculos entre universidades y empresas para el desarollo tecnológico*, ECLAC, SEGIB and United Nations, Santiago, Chile, based on information of the Brazilian Ministry of Science, Technology and Innovation (*www.mct.gov.br*).

StatLink http://dx.doi.org/10.1787/888932813478

OECD countries, they foster technology transfer from research laboratories to firms, and offer technological extension services, as well as training and business coaching services to develop new business ideas. The policy mix in developing economies is similar to that in

OECD countries, even though budgets are often significantly lower. In addition, developing countries need to invest more in programmes to promote the culture of innovation to overcome the low propensity to invest in creating and developing firms.

Public procurement is increasingly seen as a tool to foster domestic industrial capabilities in key sectors and to promote innovation. As in OECD countries, demand-side policies to support innovation are gaining impetus (OECD, 2011a). Public procurement can be used to stimulate the creation of new competences, capabilities and products or services because it creates a market for specific products and/or technologies (Kattel and Lember, 2010). Brazil, China, India and South Africa include it in their industrial policy mix. In Brazil it is used in health, defence and information and communications technologies (ICT). In China, the Government Procurement Law issued in 2002 states a preference for national purchases, leaving open space for foreigners to participate in the tendering process under specific conditions. More recently, China has introduced specific rules for public procurement to stimulate innovations developed and owned by Chinese companies. South Africa also includes it as a way of fostering industrial development (Box 4.3). Public procurement demands strong government capabilities. Controversies can arise, especially involving foreign companies which claim the application of the WTO principle of equal treatment. Complex bureaucratic requirements can also act as bottlenecks for the smooth functioning of procurement schemes (Lember et al., 2011).

Box 4.3. **Using public procurement to promote industrial development: The experience of South Africa**

The South African Industrial Policy Action Plan (IPAP) 2012-15 explicitly highlights the role of public procurement as a strategic policy tool to leverage demand to support production development in different sectors, including transport equipment, pharmaceuticals and electronics. Public procurement is used in several programmes, including the Competitive Supplier Development Programme and the National Industrial Participation Programme. In December 2011, the country improved the governance framework for public procurement by amending the preferential Procurement Policy Framework Act and including supplier requirements and specifications for local content. To increase the use of public procurement by sub-national agencies, including provincial governments and municipalities, new guidelines for Development Finance Institutions (DFIs) have been introduced to simplify regional and local procurement practices.

Source: DTI (2010).

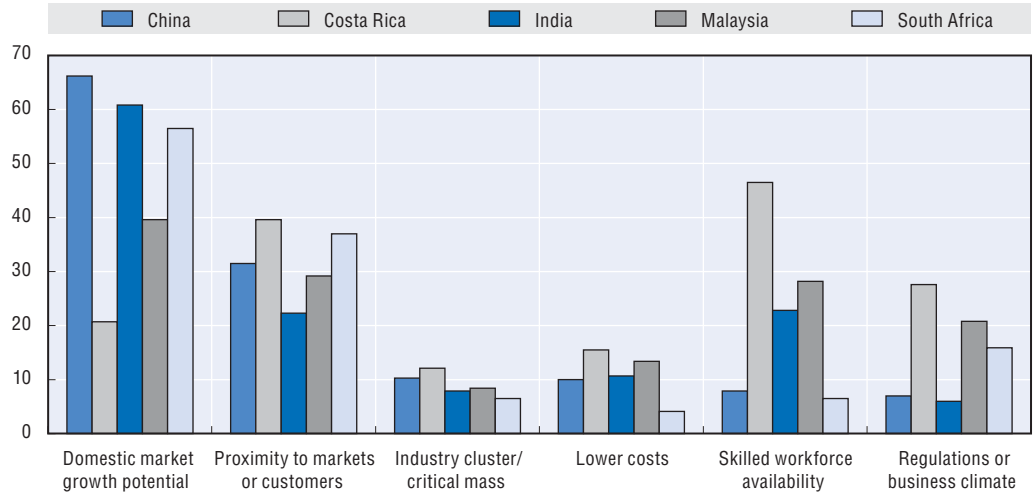
Activating learning through FDI

The changing nature of FDI turns it into a new tool to foster innovation and production transformation. Companies have started to delocalise more knowledge-intensive activities and this creates new opportunities in hosting countries (OECD, 2011b; 2012b). In the last decades delocalisation has started to be driven not only by local costs, but also by local knowledge assets, such as a skilled labour force, proximity to emerging markets and information on consumer trends in countries with rising internal demand. This type of high-value-added delocalisation has mostly benefited countries with some degree of local knowledge capacities: China and India are two examples. Market size and growth potential in addition to availability of a skilled workforce at competitive costs are the main

determinants of FDI in China and India, while in smaller countries, such as Costa Rica, the principal reason for investing in the country, as reported by investing companies, is the availability of a relatively good skilled labour force at competitive costs (Figure 4.2). Learning and upgrading domestic production from FDI are not automatic; they require a clear vision of development, empowered institutions and a coherent policy framework encompassing different levels of government and stakeholders (OECD, 2012b).

Figure 4.2. **Determinants for FDI, selected economies, 2003-12**

Percentage of total motive-citing companies



Note: Only investment motives are included that were available for all countries. Often more than one investment motive is recorded for any investing company, thus the sum of shares of companies mentioning a certain motive exceeds 100%. The share of companies for which investment motives are recorded out of the total number of investing companies in the given time period varies by country: China = 39% Costa Rica = 51%, India = 44%, Malaysia = 52%, South Africa = 36%. Data recorded from Jan 2003-Jun 2012. Only greenfield FDI investments, not including mergers and acquisitions (M&A).

Source: Authors' calculations based on fDiMarkets (2012), *fDiMarkets: Crossborder Investment Monitor*, a service from the Financial Times Ltd., *www.fdimarkets.com/*. StatLink *http://dx.doi.org/10.1787/888932813497*

Developing countries are using different means of fostering production transformation through FDI. Morocco is mostly focused on attracting multinational companies (MNCs) to create the development of specific industrial clusters, for example in the automotive industry. Malaysia and Costa Rica are two other countries with a well-known record in FDI attraction which are deepening their efforts to make FDI a lever for structural transformation. Malaysia has strong incentives to develop networks of SMEs around the activities carried out by MNCs. Costa Rica is improving the linkages between FDI and innovation policy to promote the generation of knowledge-intensive activities in the country. Even those economies traditionally more oriented towards focusing on domestic industry, such as Brazil, are considering these new forms of high-value-added FDI as opportunities for upgrading and diversification. However, FDI does not automatically generate linkages with local companies. Targeted policies to foster interaction, as well as strong domestic capacities and a supply of high quality skills, are determinant in making FDI a catalyst for domestic learning and industrial development (Box 4.4). China is also well known for its strategic management of FDI; many joint venture contracts include technology transfer agreements to help domestic companies learn and acquire new capabilities (Van Reenen and Yueh, 2012).

Box 4.4. **Attracting knowledge-intensive FDI: The experience of Costa Rica**

FDI has been a major force in transforming Costa Rica's economy. A small economy initially specialised in exporting a few primary products (e.g. coffee, bananas and sugar), Costa Rica viewed FDI attraction as a strategic option to sustain growth, enhance export diversification and create better jobs. In 1982, the Costa Rican Investment Promotion Agency (CINDE) was established as a private non-profit organisation, declared of public interest by the Costa Rican government in 1984. CINDE played an active role in country branding and offering support including pre-care and after-care services to investors. In parallel, the government focused on traditional policy tools for FDI attraction. First, it established the free trade zone (FTZ) regime offering fiscal incentives to companies investing in the country. Second, it granted fiscal credits for non-traditional exports. Throughout the 1980s and 1990s, Costa Rica focused mainly on the US market. The country's proximity to the US, its stable political and economic environment, the effective support provided by CINDE and the quality of its relatively inexpensive labour force made it a good location option for US companies wishing to delocalise some of their production phases.

The arrival of the major ICT company Intel in 1998 helped the country forge a reputation as a place for investment. Since then Costa Rica has developed a strong track record in attracting FDI. Multinational companies such as Intel, HP, P&G, Baxter, IBM and over 200 others have invested in the country and are exporting electronic components, medical devices and services from Costa Rica. However, the national innovation system is poorly developed. Commitment to investment in R&D and innovation and linkages between foreign and domestic companies remain low. Today the country is actively engaged in upgrading its FDI strategy by targeting certain knowledge-intensive sectors, including knowledge-processing services, medical devices and life sciences, advanced manufacturing and (more recently) clean technologies. This requires strengthening the policy framework and the co-ordination with innovation policy.

Source: OECD (2012b).

Encouraging entrepreneurship and start-ups

Developing economies, as well as OECD countries, are increasingly interested in fostering entrepreneurship and the creation of start-ups. The creation of new innovative firms can contribute to the dynamism of the local production system, but their voices are often unheard in political consultations for industrial policy strategy setting. While many countries are involved in implementing specific programmes and instruments to support the creation of these firms, they identify as a major challenge the capacity to involve them in government-business consultations for strategy setting. Knowledge-based companies flourish in dense innovative environments, where new entrepreneurs can interact with a high-quality and vibrant science base and where access to technologies and finance is easy and the regulatory framework is business-friendly (OECD, 2010; 2013). The diffusion of ICT and the upsurge of new areas including biotechnology and renewable energy have prompted the creation of those firms, especially in OECD countries. However, even though to a much lesser extent, this phenomenon is rising in several countries in Africa, Asia and Latin America. This is due to three main factors: *i)* high GDP growth over the last decade has contributed to creating opportunities for those firms in developing economies; *ii)* the rise in talent mobility and global production unbundling has helped workers from developing economies to acquire professional skills in foreign universities and companies,

favouring the development of an entrepreneurial culture; and *iii)* the spread of ICT has created opportunities for knowledge exchange, making start-up companies a feasible business option in developing economies as well. In addition, governments in developing countries have also started to look at those firms as a potential new source of growth (OECD, 2013).

Start-ups can contribute to upgrading and diversification strategies. In natural-resource rich countries, incentives to promote start-ups help create an innovative cluster around traditional activities. In countries with a good record of FDI attraction in high-value-added activities, promoting start-ups can be an effective way to strengthen competitiveness and to increase the impact of FDI on the local economy. Often, start-ups develop in sectors related to ICT; therefore they require adequate digital infrastructure (i.e. fast and reliable internet access) as a precondition for their creation and expansion. In Africa, technology-based start-ups operate mostly in the software and telecommunications sectors, according to the Forbes ranking of the top African start-ups (Forbes, 2012). Most of these companies are quite young and offer a variety of innovative services for the African continent; for example, a Ghanaian company provides a web-messaging platform to help companies visualise and respond to incoming messages and a Kenyan start-up is specialised in systems for online retailing in Africa.

Developing countries are starting to put in place instruments to support the creation of start-ups. Much attention has been paid to access to finance; however, although fundamental, financial resources alone are not enough to foster the creation and expansion of those firms. A legal framework that makes it easier to start and run technological businesses is paramount. Targeted programmes to foster the accumulation of technical and managerial skills are also important (Box 4.5). Each phase has specific financing, capabilities and legal requirements, which need to be in place to support the evolution of the firm (Figure 4.3). Often developing countries have mimicked the trends in advanced countries by focusing on fashionable issues, such as venture capital in the 1990s. However, what matters is not only the design of one specific instrument, but the implementation of a policy mix that accompanies the firms in all the stages of

Box 4.5. **Promoting start-ups in Latin America: Recent trends**

Promoting the creation of start-ups is an emerging phenomenon in Latin America. Several countries, including Argentina, Brazil, Chile, Colombia, Mexico and Peru have mechanisms to foster the creation of start-ups. Brazil and Chile were the first countries in the region to support start-ups and today implement a comprehensive policy mix targeting those firms. For example, in Brazil the FINEP (agency responsible for financing R&D) and the BNDES (National Development Bank) channel seed capital to start-ups through the programmes *Inovar Semente* and *Criatec*. In Chile, the CORFO (National Corporation for Production Development) has been fostering the development of risk capital since the end of the 1990s and the creation of networks of angel investors since 2006. In 2011, Chile introduced important reforms in the support to start-ups, including the new programme Start-up Chile that offers seed capital to foreign and local start-uppers. In Colombia, the government has recently introduced *INNpulsa Colombia*, an initiative managed by the national development bank (BANCOLDEX) to facilitate access to credit for start-ups and to promote an entrepreneurial culture in the country. In the last decade, Mexico has improved the legal framework to facilitate the creation and expansion of start-ups.

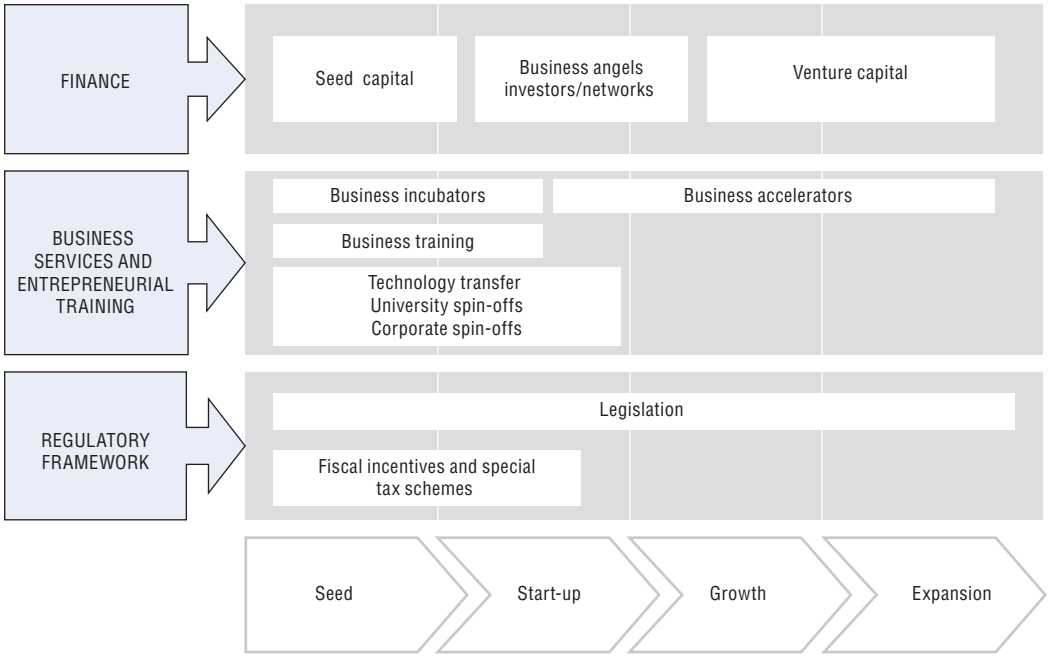
Box 4.5. **Promoting start-ups in Latin America: Recent trends** *(cont.)*

The experience of Latin American countries in promoting start-ups shows that:

- The role of the state is determinant in creating opportunities and markets that were not previously available. In Chile for instance, the venture capital industry started as a result of a government contribution from CORFO of 3 to 1 with respect to the private-sector investment.
- It is important that public policies also foster the development of an entrepreneurial culture; often in developing countries the propensity to create enterprises is lower than in OECD countries.
- The policy mix should include mechanisms to strengthen the business capacities of entrepreneurs; access to finance matters, but it is not the only determinant for success.
- Regulatory frameworks should be improved and simplified to allow firms to grow and develop. In addition, start-ups develop better in dynamic contexts. Therefore, having in place mechanisms to strengthen innovation and production capacities in general is complementary to the promotion of start-ups.

Source: OECD (2013).

Figure 4.3. **Policy mix to support start-ups**



Source: OECD (2013), *Start-up Latin America: A Comparative Study Based on Six Countries in the Region*, OECD Development Centre Studies, forthcoming, OECD, Paris.

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development. For example, venture capital is effective when early-stage financing (e.g. seed and angels investors) is available and when measures to support the development of ideas into business plans are in place, including, for example, incubators and accelerator programmes. In addition, a major challenge for industrial policy is to overcome the tension between incumbents and start-ups. Traditional policy instruments,

especially those designed to promote innovation tend to work better for established firms, while start-ups and new enterprises would require different types of incentives. Few evaluation studies are at present available on what works and what does not work in this respect, making this a priority area for additional policy-oriented research.

Supporting cluster development

A key challenge for developing economies is to strengthen the competitiveness of existing sectors. Cluster promotion is often used to support production development in sectors where the country has already installed some production capacity. Cluster support contributes to diversification and/or specialisation by fostering interaction and strengthening backward and forward linkages. Instruments to foster clusters differ from traditional tools to support production development because they target the cluster (i.e. the formal and informal network of agents) operating in a given geographical location, rather than individual firms and because they focus on service provision instead of subsidies. Promotion of clusters often includes incentives to strengthen linkages between firms, research centres, clients and suppliers. Public policies contribute to cluster development by favouring the building of trust between actors, by helping create linkages and collaboration, and by fostering innovation in products, processes and business models.

Developing countries are implementing new forms of cluster promotion to take advantage of global production unbundling. Cluster promotion is one of the traditional tools of industrial policy; however, the new global economic landscape opens up new opportunities to develop clusters leveraging on MNCs or on big national companies. For example, the Brazilian government, in partnership with Petrobras (the national oil company) has been implementing since 2003 a programme to support linkages with domestic providers (PROMIMP). Chile in 2005 promoted a public-private partnership to increase the linkages and spillovers of the mining activities to the domestic economy (Box 4.6). In countries where FDI plays a determinant role in the economy, programmes to support cluster development can contribute to creating spillovers to the domestic economy. However, designing and implementing those programmes is difficult and strong incentives need to be put in place to obtain the commitment of the private sector. Morocco is aiming at developing national production clusters in key areas, including the automotive sector by promoting linkages with MNCs. Increasing the linkages with the local economy is also part of the enhanced policy framework for FDI in Costa Rica (OECD, 2012b). Developing countries are implementing cluster policies in several sectors related both to natural resources and to participation in global value chains.

Fostering cluster development can have a high potential impact, but also implies substantial co-ordination costs. Promoting clusters in developing countries requires better articulation between national and regional actions, as well as stronger institutional capabilities in regions. It also needs well-articulated forms of partnership with the private sector and targeted actions for trust building. Cluster promotion goes beyond providing access to finance; it is about creating the conditions for creating and sharing know-how, information and technologies.

Box 4.6. **Fostering supplier networks in the mining sector in Chile**

For many years mining has been seen as having a double-edged impact on developing countries. On the one hand it propels economies such as Chile, which sees the copper boom as a blessing that has allowed the country to save – through a sovereign fund – an amount equivalent to more than 25% of GDP. On the other, it produces enclaves and productive silos that relate marginally to local industry and appreciates the exchange rate, discouraging productive diversification. An initiative developed in the north of Chile within the copper industry may prove this to be not as true as might be thought.

Since 2005 the Chilean government, through its development agency CORFO, has sponsored the functioning of a public-private dialogue aimed at formulating and materialising a strategy to expand the multiplier effect of the mining sector in the domestic economy, strengthening the linkages between the mining companies and their domestic suppliers. The participants in this dialogue are the major mining companies of the country – public and private multinational companies, organisations of domestic producers of capital goods, supplies and services, higher education institutions and the authorities of the mining regions.

Once the participants had agreed on a common vision of the future of the cluster and the main challenges involved, the mining company BHP Billiton launched an initiative to develop "World Class Suppliers to the Global Mining Industry" in Chile. The programme aims to foster the technical and managerial upgrading of its suppliers, to transform them into partners in addressing their technology and production challenges. The state-owned company, Codelco joined the initiative. Both companies have assigned strategic priority to this initiative, which contrasts with the historic approach of mining companies in Chile, marked by scepticism about the capabilities of local firms. From its beginning until now more mining companies have joined in and CORFO and the Ministry of Mines play an active role in supporting this public-private innovative effort.

The programme was designed to face two major challenges: *i)* trust building: to work effectively with local providers the big mining companies had to overcome the distrust towards local companies in terms of quality standards and management capacities; and *ii)* upgrading the technological capacities of local providers. On both of these fronts, the programme consolidates best practices creating capacities among local actors both inside and outside the mining company, allowing the initiative to grow sustainably over time.

The initiative is quite new, but has already achieved several goals. The number of local providers to the mining cluster increased from 5 in 2008 to more than 70 in 2013. The programme has also fostered innovations, including the development of cables that last more than 30% longer, new preventive maintenance systems that improve the performance of high-cost tyres, development of alternatives to reduce the impact of particulate matter in mining operations (bioremediation, environmental predictive models, etc.), among others. In addition, some local companies have started to export the products and services developed in the context of the programme to foreign markets.

Source: "World Class Suppliers to the Global Mining Industry", presentation by BHP Billiton.

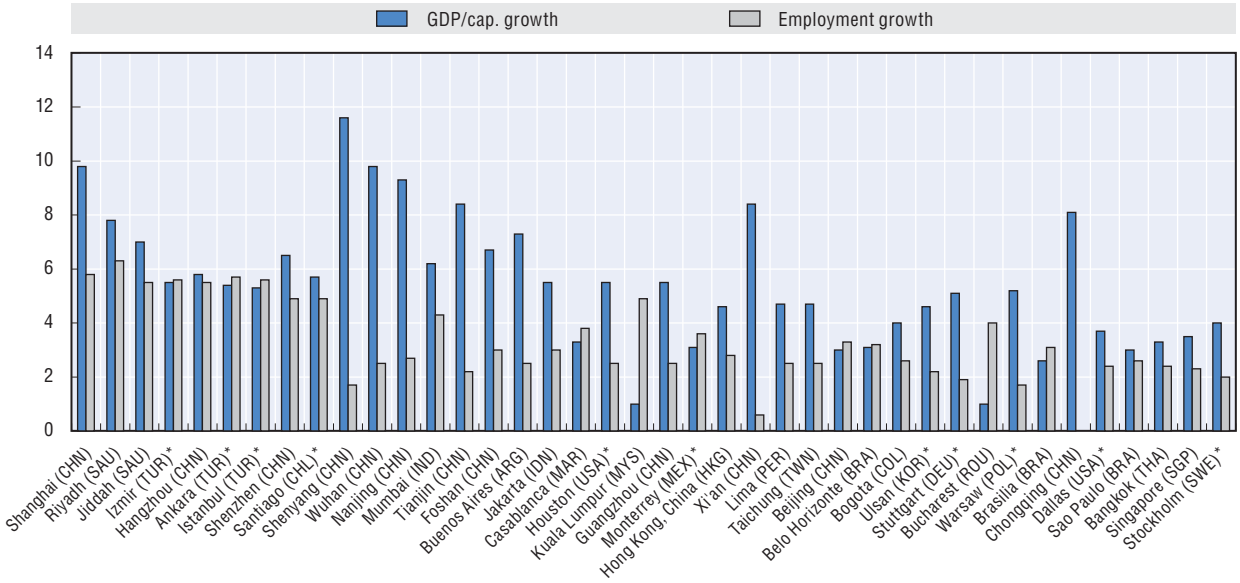
Empowering territories as agents of change

The renewed interest in industrial policy in developing economies is accompanied by an explicit concern for the territorial dimension. This marks a difference with early industrial policy efforts, when the regional dimension was taken into account only as a way of compensating for the agglomeration effects caused by industrialisation. Today the

rationale for addressing the regional dimension is broadening; compensation remains crucial for certain areas and aspects, but territories are increasingly seen as new sources of growth. Regions and cities are becoming key units for industrial policy planning and implementation. New territories and cities are emerging as production hotspots (McKinsey, 2012). The places for doing business have shifted from London and New York to São Paulo, Bangalore, Moscow and Johannesburg. Middle-sized cities in regions such as the northeast of Brazil or inland China are also growing as production sites and exhibit rising domestic demand. Of the top 40 fastest-growing global metropolitan areas, 29 are from non OECD economies (Figure 4.4).

Figure 4.4. **Top 40 global fastest growing metropolitan areas, 2010-11**

Percentage growth rate



Note: The graph includes the 40 fastest growing metropolitan areas of the Global Metro Monitor 2011 in the order of their ranking (Shanghai = 1, Stockholm = 40). An asterisk depicts metropolitan areas in OECD countries. The Global Metro Monitoring defines a metropolitan area as an economic region with one or several cities and their surrounding areas, all linked by economic and commuting ties. In the United States metropolitan areas are defined by the Federal Office of Management and Budget (OMB) as including one or more urbanised areas of at least 50 000 inhabitants plus outlying areas connected by commuting flows. For European Union (EU) countries, the European Observation Network for Territorial Development and Cohesion (ESPON) defines metropolitan areas as having one or more functional urban areas of more than 500 000 inhabitants. A functional urban area is comprised of an urban core and the adjacent area economically integrated with the centre. For metropolitan areas outside the United States and Europe, the official definition from national statistics is used.

Source: Authors' calculations based on Brookings Institution (2011), *Global MetroMonitor 2011: Volatility, Growth and Recovery*, The Brookings Institution, Washington, DC.

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The development of production capabilities in emerging and developing economies is not happening in a balanced way within countries. Only some regions are increasingly connected and linked to global innovation networks (Box 4.7). Growth, production and innovation are taking place in specific locations within countries, while most of the territory still lags behind. This trend, if not counterbalanced by active policies for territorial development, may create social tensions and undermine potential growth in the future by neglecting new sources of growth and by engendering decreasing returns in large-urban agglomerations. In addition, in some countries, such as China, India and Brazil the territorial perspective is essential; regions and states in those countries do not only differ in respect of natural endowments, history and culture, but often have populations that are larger than entire European countries.

Box 4.7. **Regions and international innovation networks: Variety in co-inventorship patterns**

Networks are increasingly important for innovation. However, less is known about the role of regions and location in shaping collaboration patterns and about the variety of collaboration behaviours that coexist in global economies. Based on co-patenting data among inventors located in OECD and selected non-OECD regions, Ajmone Marsan and Primi (2012) provide an overview of co-inventorship patterns at the regional level, focusing on the performance of the top 20 patenting regions in telecoms, biotechnology and renewable energies, by combining descriptive statistics with social network analysis. Evidence shows that: *i)* top patenting regions exhibit very different collaborative behaviours: some tend to reach out to a great number of extraregional partners, whereas others tend to co-invent in a less "open" way; *ii)* co-inventorship networks evolve over time and tend to become denser; *iii)* co-inventorship networks in different technologies show different evolution patterns; *iv)* first movers, i.e. early leaders, tend to maintain their leadership role over time, but there are opportunities for other regions to become local, national or global hubs; *v)* national borders play an important role. Most top patenting regions show a high propensity to establish co-patenting collaborations within their national borders. This can be due to geographical proximity, scientific, linguistic and cultural proximity.

Source: Ajmone Marsan, G. and A. Primi (2012), "Tell Me Who You Patent With and I'll Tell You Who You Are: Evidence from Inter Regional Patenting Networks in Three Emerging Technological Fields", *OECD Regional Development Working Papers*, 2012/03, OECD, Paris.

The role of territories in industrial policy is shaped by the institutional framework. In developing economies, as in OECD members, a variety of institutional arrangements coexist (Table 4.1). In Brazil and India subnational governments enjoy a significant role in mobilising industrial and innovation policy. In China the central government maintains strong control over local authorities, by appointing them. But in practice local authorities have an ample margin of manoeuvre for policy planning and implementation (Xu, 2011). The role of regions in industrial policy changes over time. In Korea, for example, during the catching-up phase regional authorities were directly appointed by the central government and had a low level of autonomy. From the late 1990s, the country engaged in successive reforms to strengthen the role of regions by increasing the devolution of resources to regional development (OECD, 2012a). Institutional and professional capabilities at sub-national levels of government influence the ability to design and implement effective policies. Usually lower levels of government suffer from perceptible capacity gaps relative to central government; in addition there are large differences among regions and provinces within countries. Investing in creating institutional capabilities at the local level is determinant for realising the potential production development of territories.

Several developing countries are backing up national industrial policy with regional industrial policies. Regional actors, if empowered with responsibilities and resources, are powerful allies in implementing industrial policy; often they are better placed to support cluster development in existing sectors. Brazil, for example, has introduced specific measures to regionalise its industrial and innovation policy, by fostering the elaboration of regional industrial development plans and by strengthening institutions in the

Table 4.1. **Variety in regional institutional frameworks, selected developing economies**

Degree of planning and financing responsibilities in industrial and innovation policy of sub-national governments	National multilevel governance setting		
	Federal countries	Unitary countries	
		Elected regional authorities	Non-elected regional authorities
Significant	**Brazil** **India** (Examples in OECD countries: Germany, Canada, Switzerland, United States)	(Examples in OECD countries: Italy, Spain)	**China**
Medium	**Argentina** **Malaysia** **The Russian Federation** (Examples in OECD countries: Mexico)	**Colombia** (Examples in OECD countries: France, Netherlands, Poland, Korea)	
Limited		**South Africa** **Peru** (Examples in OECD countries: Denmark, Turkey, Chile, Japan)	**Indonesia** **Morocco** (Examples in OECD countries: Ireland, Finland)

Note: China, India and Indonesia have multiple relevant institutions at different government levels below the national one with responsibilities in industry and scientific and technological development with non-elected authorities. Significant responsibility in industry and innovation does not imply a better performance, or a judgment of value; it refers to a different organisation and it implies different policy options. The degree of devolution of competences in innovation-related matters is subject to change. Information reported in this table refers to the first semester of 2010 for OECD countries, and to the second semester of 2011 for non-OECD economies.
Source: Draws on and updates OECD (2011d), *Regions and Innovation Policy*, OECD Publishing, OECD, Paris, doi: *http://dx.doi.org/10.1787/9789264097803-en* and OECD (2012a), *Industrial Policy and Territorial Development: Lessons from Korea*, Development Centre Studies, OECD Publishing, Paris, doi: *http://dx.doi.org/10.1787/9789264173897-en*.

territory. In parallel, the BNDES has recently set targets to channel investment to lagging regions to reduce the concentration of financing in Rio de Janeiro and São Paulo. Other countries are using export processing zones (EPZs) to favour the creation of a critical mass and encourage FDI. India and Morocco are relying heavily on EPZs to address infrastructure gaps and to attract investment in specific sectors. The impact of EPZ on the local economy is, however, mixed and high-quality planning is required to foster the creation of backward and forward linkages (Srinivas, 2006; 2012). To strengthen the roles of territories, developing countries are defining "functional regions"[4] beyond administrative borders. In 2007, India started to implement the Delhi-Mumbai Industrial Corridor which includes six states. To facilitate the implementation of this intra-state project a national planning agency, the DMIC Development Corporation, was set up in 2008 to co-ordinate investment projects carried out by the different state agencies. The project also required the creation of new state agencies, such as the regional development authority (RDA) in the state of Gujarat (DIPP, 2011).

In developing areas well endowed with raw materials, regions are increasingly important because they are receiving growing royalties from the exploitation of natural resources**.** Several developing economies have created mechanisms to channel resources from those activities to production development and innovation. Chile has been a pioneer in this field. In 2005, the government introduced legislation that established the transfer of the royalties from mining exploration to a government fund. In parallel, the country created a Fund for Innovation and Competitiveness (FIC) financed by those royalties. This more than doubled the innovation budget, but at the same time

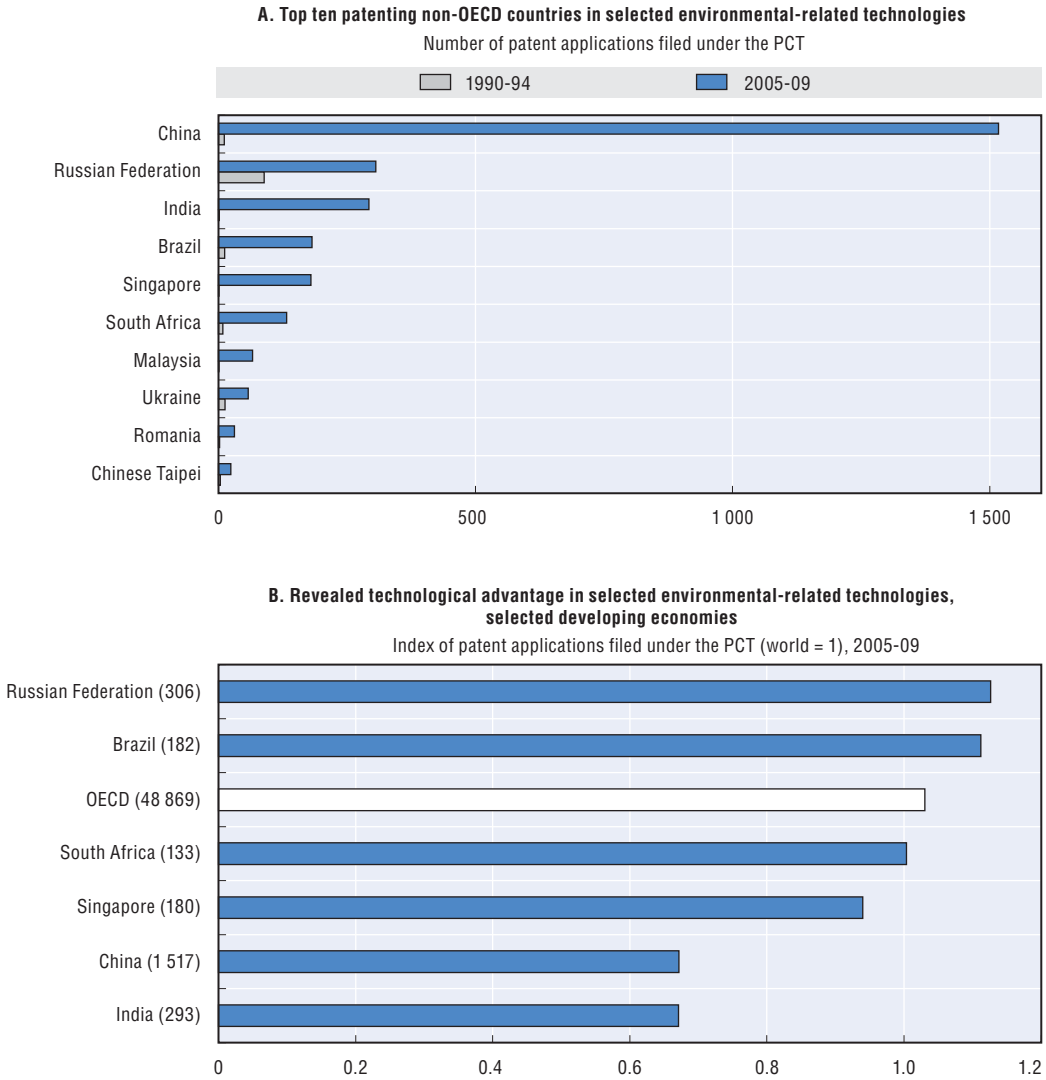
challenged the management of the resources since it was essential to reach an agreement with regions regarding the allocation of the funds (OECD, 2011c). Today other countries, including Colombia, Peru and South Africa, are engaged in defining mechanisms to channel revenues from natural resources towards production transformation. Defining those mechanisms needs the creation of consensus between regions. The communities hosting natural resource-intensive activities claim rights on the use of the rents generated through those resources, and reaching agreement on what to finance with those rents is not easy. The creation of government funds based on royalties is a step in the right direction, but it is not a panacea for natural resource-rich countries. The design, management and governance of the financing schemes are complex. Political leadership and long-term support are required and central and regional governments need to learn how to manage those new financing schemes.

Seizing the potential of sustainable development

Developing economies are investing in environmental-related technologies. Estimates indicate that in 2009 China, India and Brazil invested USD 44.2 billion in renewable energy (Mathews, 2012), accounting for 37% of global investment in that field (Azuela and Barroso, 2011). Chinese companies are already among the global top ten producers of renewable energy equipment (Mathews, 2012 and Fang et al., 2007). Patent applications in environmental-related technologies have been growing. OECD economies lead in several areas, for example Australia in water pollution, Denmark in renewable wind energy, Germany in air pollution, and Spain in solar energy (OECD, 2011e). However, over the past decade, emerging economies have increased the number of patent applications in environmental-related technologies, and even though the number of patent applications is still low compared with OECD countries, some of them, such as Brazil and the Russian Federation, are more specialised in these technologies than the OECD average (Figure 4.5).

Sustainable development is included among the priorities of industrial policy in developing economies. Several countries offer incentives to create domestic research and technological capabilities in domains related to sustainable development. Those incentives are part of programmes that aim to push the technological frontier forward to grasp future opportunities. Developing countries foster sustainable industrial development through several mechanisms (Table 4.2). China, for example, provides financing to green projects at favourable interest rates; South Africa has specific lines of financing for renewable energy projects. Other countries are using direct subsidies, tax credits and regulations to foster the development of sustainable industries.[5] However, an international agreement on how to shift towards sustainable industrial development and who should bear the costs is far off. The limits of a "business-as-usual" approach to industrialisation become evident when attention is paid to the phenomenon of shifting wealth, and the rise in the number of potential consumers from the growing middle classes in developing economies and their growing infrastructure needs (Dahlman, 2011; Mathews, 2012). The entry of China into the green energy market helps make "green" a cheaper option than before. For example, the expansion of manufacturing of solar photovoltaic cells and of wind energy in China is bringing down the costs by making these goods more affordable for other developing economies (Mathews, 2012).

Figure 4.5. **Patents in environmental-related technologies, developing economies**



Note: PCT is the Patent Co-Operation Treaty. Patent applications are by priority date and country of residence of the inventors, using fractional counts. Environmental related technologies (ERT) are defined following the OECD definition. According to the official OECD definition, selected environmental related technologies include technologies in the fields of: general environmental management (air, water, waste), energy generation from renewable and non-fossil sources, combustion technologies with mitigation potential (e.g. using fossil fuels, biomass, waste, etc.), technologies specific to climate change mitigation, technologies with potential or indirect contribution to emissions mitigation, emissions abatement and fuel efficiency in transportation and energy efficiency in buildings and lighting. The revealed technological advantage indicator is calculated as the share of environmentally related technology patents (ERT) in a country's patents relative to share of ERT patents in total patents. Number of total environmental related technology patents per time period in parentheses. Only countries with ten or more environmental related patent applications are included.
Source: Authors' calculations based on OECD (2012e), *Patent database*, *http://stats.oecd.org/*.

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Developing economies are introducing new dimensions in the design and implementation of industrial policy to address the challenges of sustainable development. First, sustainable development involves more than sustainable technologies. Therefore, incentives also need to influence consumption and cultural behaviours. Several countries are investing in improving legal frameworks and in awareness campaigns. Second, local

Table 4.2. **Sustainable development initiatives, selected developing economies, 2012**

Country	Examples of green industrial policy initiatives
China	**Green finance** Following the 11th Five Year Plan (FYP) 2006-10 and the 12th FYP 2011-15, China's state-owned banks favour loans to emerging green strategic industries. **Legal Framework** 2006 Renewable Energy Law which introduced feed-in tariffs in China and 2008 Circular Economy Law.
India	**National Development Planning** Priority area in the National Five Year Plan. Five-year targets for renewable energy development. **Institutional upgrading** Creation of Indian Renewable Energy Development Agency (IREDA) and the Ministry of New and Renewable Energy (MNRE, formerly Ministry of Non-Conventional Energy Sources) to ensure political and financial support. Green Manufacturing Committee **Government support to green R&D programmes** Special clause will be included for green projects in the Technology and Acquisition Development Fund. **Government Investment** *Jawaharlal Nehru National Solar Mission*. In 2009 the government announced a USD 19 billion plan to produce 22 GW of solar power by 2022, up from 2 GW in 2009.
Brazil	**National Development Planning** The Brazilian Energy Research Company (EPE), the research arm of the Ministry of Mines and Energy, set a ten-year Energy Plan. It envisages an expansion of 60% in energy demand over the next decade, and investment of BRL 190 billion (Brazilian reals) of which BRL 100 billion would go on renewable energy contracts (55% on hydro and 45% on wind, biomass and small hydro). **Government support to green R&D programmes** The National Development Bank, the Ministry of Science and Technology and several agencies involved in supporting R&D development have targeted programmes for R&D in green areas, including ethanol which has been supported since the 1970s. **Green Finance** The BNDES manages the Amazon Fund (a USD 1 billion international funding effort) and is investing in developing new criteria for assessing the financial viability of green projects. BNDES is investing in several green projects including the creation of new ethanol pipelines. **Public procurement and auctions** In December 2009, Brazil's National Electric Energy Agency (ANEEL) held the country's first wind power auction, offering 1.8 GW in power contracts for wind power plants, with delivery beginning in July 2012. The Brazilian Wind Energy Association with government support has set a goal of reaching 10 GW of wind power capacity by 2020.
South Africa	**National Development Planning** South Africa has an official goal of producing 4% of the nation's electricity from renewable sources by 2013 and improving energy efficiency by 12% by 2015. **Green Finance** The Clean Technology Fund (CTF) of USD 500 million created by the African Development Bank in conjunction with the World Bank. It targets renewable energy projects encompassing grid-connected solar thermal power, wind power and energy efficiency projects in both the industrial and commercial sectors.

Source: Authors' elaboration based on Mathews (2012), "Why should Developing Countries be Concerned about Green Growth?", background paper prepared for the OECD Development Centre's *Perspectives on Global Development 2013*, OECD, Paris.

and regional initiatives can play a key role in experimenting with new sustainable development solutions (OECD, 2011e). In China several regional-level initiatives are contributing to sustainable industrial development, including the Suzhou Industrial Park near Shanghai, the Wixi solar panel cluster and the Tianjin Economic Development Area (Fang et al., 2007; IDA, 2012). Third, additional sources of financing are needed. In India, for example, a major obstacle is the lack of availability of finance on the required scale. International financial institutions could step in; the Asian Development Bank started a pilot operation of green bonds in India in 2011. Fourth, sustainable development is opening up new opportunities for South-South co-operation. Emerging economies are increasingly investing in developing countries with potential for sustainable industrial development;

for example Brazilian, Chinese, Indian and Korean companies are investing in Mozambique to develop solar panels. Industrial policy needs to take this new international dimension into account.

Monitoring implementation and evaluating impact

The rising concern with the implementation of industrial policy comes with stronger demands for accountability. This renewed interest is due to three factors:

- The entry into a non-expansionary phase of the economic cycle caused by the financial and economic crisis that began in 2008 has raised pressures on governments to contain budgets. Monitoring and evaluation are crucial for preserving the necessary measures from costly cuts.
- Increasing demands from middle classes make civil society and the various constituencies, including local and regional authorities, demand more accountability for policy choices. In developing economies, where industrial policy often competes in budget allocation with policies directly targeting social imbalances, transparent monitoring is necessary for creating consensus on those actions.
- The new information society increases the demand for policy accountability, putting pressure on governments to show results of policy actions; the spread of ICT has reduced the costs and increased the possibility of generating information, making new types of monitoring and evaluation practices possible.

Developing economies are increasingly considering evaluation not as objective in itself, but as an instrument for implementation. Evaluating industrial policy is difficult, but crucial to improving policy effectiveness (Box 4.8). Monitoring and assessing implementation are good opportunities to spot possible mismatches between complementary policies, including innovation, skills, finance and infrastructure. In South Africa the mid-term review of industrial policy specifically asks for clarification of co-ordination requirements with other policies and government strategies. In India, the Performance Management Division is responsible for supporting each government department in monitoring implementation and in measuring achievement of targets. Recently the government has established a new accountability framework that assigns the yearly budget on the basis of performance. Developing countries are also strengthening institutional capabilities for monitoring and evaluation. In Colombia, the Observatory for Science and Technology (OCyT), created in 1999 as a public-private partnership initiative, is responsible for producing qualitative and quantitative indicators to monitor trends and support the process of strategic decision making. In China, the National Centre for Science and Technology Evaluation (NCSTE) was created in 1997 to monitor and assess the impact of government policies.

Developing economies are increasing the visibility and traceability of implemented programmes. For example, in 2009 Malaysia introduced the Performance Management and Delivery Unit (PEMANDU) under the Prime Minister's Department. The unit is responsible for monitoring and assessing the implementation of the Government Transformation Programme (GTP) and the Economic Transformation Programme (ETP). In South Africa, the Department of Trade and Industry (DTI) has to present a mid-term implementation review, including quantitative and qualitative achievements of strategic and sectoral targets, including the number of beneficiary firms, number of jobs created, allocation of government support and changes in legal framework. It is also required to report annually

to the parliament the implementation results of the Industrial Policy Action Plan. The evaluation process includes a review of mid-term challenges and opportunities and a reassessment of strategic priorities taking into account what has been achieved and potential new challenges.

Policy implementation reviews are good opportunities to spot possible mismatches among complementary policies, including training, finance and infrastructure. In South Africa the mid-term review of industrial policy implementation also clarifies the co-ordination requirements with other policies, including trade, competition, technology, innovation and the green economy. In India the Performance Management Division is responsible for supporting each department in the monitoring of implementation and in measuring the achievement of targets. Recently the government established a new framework for accountability and started assigning the yearly budget on the basis of performance. In line with this, since 2009 the Indian Department for Industrial Policy and Promotion of the Ministry of Commerce and Industry has required the elaboration of a results framework document. The document lists the policy actions and identifies success indicators. It also includes a matrix to clarify specific requirements from other departments.

New data are starting to be collected and used in developing economies to inform policy choices. Following the experience of OECD countries, which have accumulated expertise in collecting and analysing firm-level data, some developing economies have started to carry out surveys to increase awareness of production and innovation dynamics (Cimoli et al., 2011). Firm-level surveys make it possible to show the heterogeneity in the behaviour of firms and to better target policies (Mayer and Ottaviano, 2007; Criscuolo et al., 2012). Availability of firm-level data is still limited in the majority of developing economies, especially in Africa, but in certain countries firm-level data are increasingly collected and analysed. Several countries in Latin America, for example, collect innovation surveys which are of help in understating firms' innovative strategy and the impact of policies (Primi and Rovira, 2011). For example, a comparative analysis of innovation surveys in Latin American countries reveal that: *i)* bigger firms are more likely to be engaged in co-operative R&D than small firms; *ii)* firms with higher levels of skills tend to co-operate more than the average; *iii)* an innovative environment stimulates the openness of firms and their propensity to collaborate; *iv)* some sectors require more interaction and linkages than others to innovate; *v)* public support can be a significant determinant of collaboration (Primi and Rovira, 2011). This information can be of help in designing better policies. Horizontal support to collaboration will tend to advantage large firms; this is why countries often implement specific programmes targeting SMEs.

Policy monitoring is on the rise, but impact assessment is rare in developing countries. Few countries dispose of measurable, simple and meaningful performance indicators. In addition, countries face difficulties in evaluating the impact of industrial policies because multiple indicators are needed, beyond the industrial policy mix *stricto sensu*. The capacity to access and exchange the information generated by different governmental bodies is crucial in carrying out multi-dimensional impact assessments.

Box 4.8. **Evaluating industrial policy: Methodological challenges and country experiences**

Evaluating industrial policy is a challenging task. There is no conclusive evidence on the best method to assess its impact. The fact that it comes in different forms and shapes in different contexts makes it hard to identify the best methodology. In addition, the multiplicity of factors affecting the policy outcome (for example, the business cycle, the increase in the number of innovative firms, etc.) and the impossibility of determining what would have happened in the absence of the policy (i.e. to define a counterfactual), make it difficult to carry out traditional cost-benefit analysis (OECD, 2012c and 2012d). The capacity to access and exchange information generated by different bodies is crucial for multi-dimensional impact assessments. Defining what to evaluate, i.e. the implementation and/or the impact of a specific programme or the overall industrial development strategy, is also challenging. Methods based on multi-dimensional criteria to assess both quantitative and qualitative outcomes are desirable, but difficult to manage and implement. First steps in this direction are the generation and accessibility of the information required for policy assessment and the development of capabilities and mechanisms that favour feedback of evaluation into policy planning. This often requires the strengthening of institutional functions charged with monitoring and evaluation capacities. But it also entails conceiving evaluation as an integral part of the policy cycle, and not as an external control function of checks and balances. In small countries, external support is often essential for carrying out policy evaluation; however, even in those cases, the direct participation of local constituencies is essential to ensure meaningful evaluation exercises.

In Malaysia, for example, in spite of high investment in supporting SMEs for a long period, there was no assessment of the effectiveness of those programmes until 2010. The government evaluated the achievements of macrotargets, but it was not engaged in assessing the impact of specific programmes. The difficulty in assessing the impact of government action on SMEs was also increased by the multiplicity of ministries (more than 15) and agencies (60) in charge of managing instruments in support of SMEs (SME Corp. Malaysia, 2012). In 2010 the country, with the help of the World Bank, carried out the first impact assessment of SME programmes (SMEs Corp. Malaysia, 2012). The methodology included a survey into the beneficiaries of government incentives, matched with data from the census carried out by the national department of statistics. The assessment shows that different programmes had diverse impacts. The implemented e-programme grant and soft-loans had the highest impact on the different categories, while no programme had much impact on employment generation.

Conclusion

Developing countries are increasingly concerned about the implementation of industrial policy. The new global economic landscape poses new challenges that need to be taken into account. Industrial policy is highly specific to context and time. Options that are promising for one country at a given moment in time are not necessarily good for other countries or for the same country at a different historical moment; but there are lessons to be learned from successful cases. Effectiveness in implementing industrial policy depends on institutional strengths and on the capacity to align actions in several fields. For developing countries the capacity to upgrade skills for current and future needs, the improvement of infrastructure and the availability of long-term financing are of particular

importance. (These issues are further discussed in Chapters 5, 6 and 7). However, developing countries also face common challenges: a major issue for them is how to foster production transformation to sustain growth and create jobs. What instruments can help? Which institutions are needed? The answer will differ by country, but common requirements for successfully implementing industrial policies are:

- strong domestic institutional capabilities, at the national and regional levels;
- availability of information and the capacity to process it, to carry out diagnoses of domestic and foreign trends;
- effective availability of resources to execute actions and co-ordination capacities to align actions in several fields.
- spaces for dialogue with the private sector to build partnerships and create synergies in investments.

Notes

1. See for example: Rodrik, 2008; Cimoli et al., 2009; Chang, 2011; Coutinho et al., 2012; Lin, 2012; Noman and Stiglitz, 2012; Zalk, 2012.
2. The literature on government failures provides examples of past unsuccessful experiences in government interventions and advocates a minimalist government agenda that focuses on getting the framework conditions right to enable markets to operate efficiently (Krueger, 1990). Richardson (1960) and Williamson (1975) analysed the risks of state planning in a context of imperfect information.
3. Countries develop through trial and error processes and institutions that are determinant in shaping development trajectories by creating systems of checks and balances, allowing countries to fine-tune actions in line with the national development strategy (Chang, 1994; Cimoli et al. 2009; Reinert, 2007).
4. The term "functional region" describes geographical areas that share certain economic and cultural characteristics (including industrial specialisation, natural resource endowments, etc.), but which do not have a political or administrative unit of references. Often functional regions do not coincide with administrative regions.
5. For an analysis of the role of the state in supporting environment friendly technologies see Acemoglu et al. 2012.

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Chapter 5

Upgrading skills for current and future needs

Skills are a key component of industrial development. By making economies more flexible in the face of technological change and spurring innovation, they enable developing countries to shift from an input-driven to a productivity-driven growth model. Skills are necessary to increase total factor productivity, hence to move up the value chain. By contrast, skills mismatches – either shortages or surpluses – curb productivity growth and affect the ability of firms to compete globally. In this respect, co-ordination failures in developing countries translate into a suboptimal allocation of skills, thus slowing down economic growth. To remain competitive in the global economy and shift into industries with higher technology and greater knowledge intensity, industrial policies should not only invest in more and better skills, but also align education with labour market needs, improve the school-to-work transition, encourage the long-term adaptability of skills and promote international skills mobility. The international experience shows that the co-ordination of action between the main stakeholders in the skills market is a significant condition of success.

Note: 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.

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 Islands. 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 Commission:* 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.

Introduction

One of the major questions in current debates about development is how developing countries can convert rapid economic growth rates into stable and permanent growth. Very few countries have succeeded in reaching advanced-country status in the last 25 years.[1] The inability of many developing countries to make the leap to advanced-country status is known as the "middle-income trap".[2] This is because the economic model that enables low per capita income countries to become richer no longer applies when they need to move to the high-income level (Kharas, 2010). On the one hand, most middle-income countries face growing competition from low-wage countries in respect of low-tech standardised products. On the other, their firms are not competitive enough to turn to high-tech innovations.

One reason why middle-income countries have difficulties moving up the global value chain is the lack of adequate skills. Even though research and development (R&D) spending is of paramount importance, home-grown technological change is only possible if emerging economies have enough skills not only to adapt to such change, but also to innovate and develop their own technologies. However, in many countries, investment in human capital is either insufficient or not adapted to the needs, a factor that contributes to curbing the development of skills-oriented industries. By contrast, the adoption of efficient skills strategies constitutes a necessary condition for developing countries to make the leap to high-income status.

This chapter discusses the importance of adequate skills in the framework of industrial policies to help developing countries move up the value chain. The first section explains why investing in skills matters not only in stimulating economic growth, but also in helping developing countries enter higher segments of the value chain. The second focuses on the phenomenon of skills mismatches and analyses the different reasons why they occur in developing countries. It shows how both skills shortages and surpluses have a negative impact on the economies of developing countries. The third section highlights how co-ordination failures affect the skills market and provides a series of policy recommendations to help developing countries address the skills challenge.

Why investing in skills matters

Skills play a key role in the development of a country. That is first because investments in education and training have a positive impact on economic growth and second because skills are a driver of structural transformation in developing countries, in particular through the process of industry upgrading.

Empirical evidence suggests that the level of education of a country is proportional to its wealth (Krueger and Lindahl, 2001; Aghion et al., 2005). Figure 5.1 shows that there is a strong correlation between the education index, a composite measure of the adult literacy rate and the combined gross enrolment rates for primary, secondary and tertiary schools, and gross domestic product (GDP) per capita. Not surprisingly, OECD countries perform better on average than the rest of the world. Some non-OECD countries with high

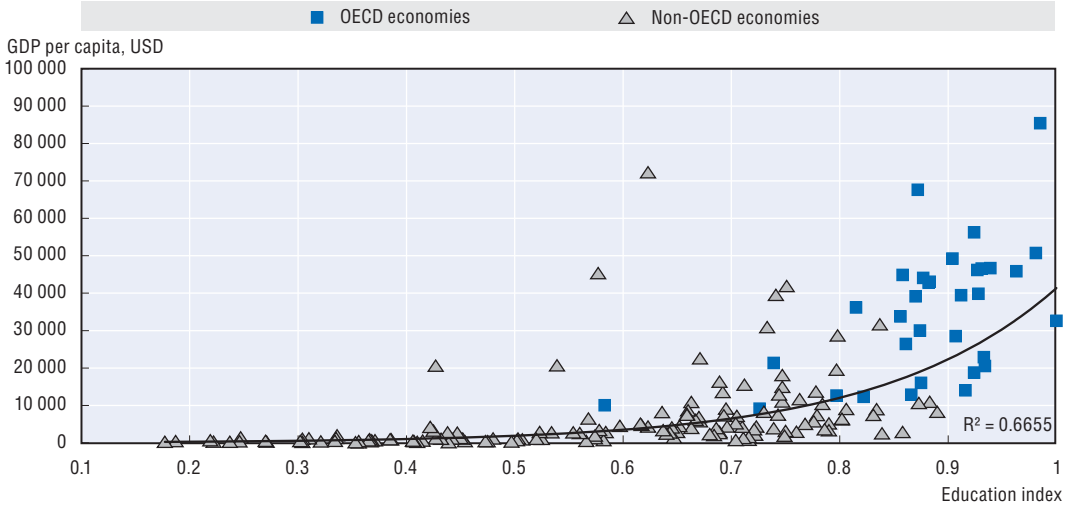
Box 5.1. **Education and skills are not synonymous**

Education contributes significantly to building skills but it is not the only way. Skills are defined as "the bundle of knowledge, attributes and capacities that can be learned and that enable individuals to successfully and consistently perform an activity or task and can be built upon and extended through learning. The sum of all skills available to the economy at a given point in time forms the human capital of a country" (OECD, 2012a). More precisely, skills can be broken down into three main components, which can all be acquired throughout the life cycle:

- The first component corresponds to the **academic skills** that individuals can learn during their school life. The main academic skills are related to numeracy and literacy. But in today's technological world, information, communication and computer skills are also essential (OECD, 2012b).
- The second major component concerns **technical skills**, which represent the main asset of an individual in the labour market. These professional-oriented competences enable workers to do their jobs and can be acquired at school, but also, and probably mainly, during the working life.
- The third component is related to the **behavioural skills** that all individuals build throughout their lives, in particular in family and social life. Interaction with other people helps individuals build their so-called "soft skills", such as interpersonal, communication and management skills. Besides academic and technical skills, behavioural skills are increasingly taken into account by employers when they hire new employees.

education indices, such as Georgia and Ukraine, belonged to the former Soviet Union, although their ranking is not directly reflected in their economic performance. By contrast, oil-exporting countries such as Equatorial Guinea, Kuwait, Oman and Qatar register a better GDP per capita than would be expected from their education index.[3] But apart from a few exceptions, the link between education and growth is particularly strong.

Figure 5.1. **Education index and GDP per capita, 2010**



Notes: The education index is measured by the adult literacy rate (with two-thirds weighting) and the combined primary, secondary and tertiary gross enrolment ratio (with one-third weighting).

Sources: Authors' calculations based on UNDP (2011), *Human Development Indicators 2011*, UNDP for the education index and World Bank (2012b), *World Development Indicators* (database), *http://data.worldbank.org/indicator* for the GDP per capita.

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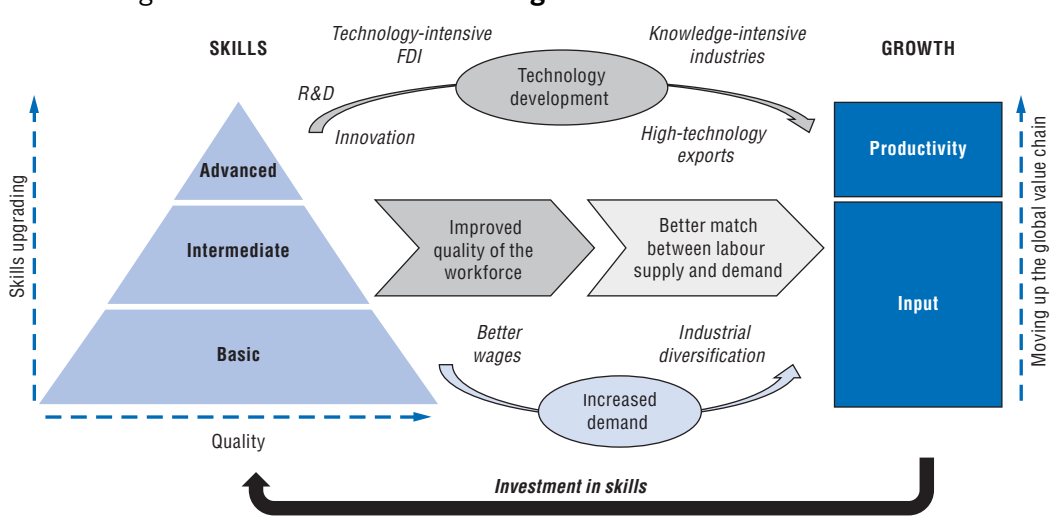
There are many potential transmission channels between education, skills and economic growth (Benhabib and Spiegel, 1994; Vandenbussche et al., 2006). Although correlation does not imply causation, Figure 5.2 summarises how investing at all skills levels can affect growth, in its two main dimensions – input and productivity:

- Better skills contribute to improving the quality of the workforce. This may not only improve workers' productivity, but also facilitate the match between supply and demand in the labour market.
- If skilled workers receive better wages, they can then consume more (OECD 2012c). The increase in aggregate demand also comes with a process of industrial diversification and technical specialisation that benefits growth.
- A country that invests in advanced skills has more possibilities of developing its own R&D and innovation, and of attracting more technology-intensive foreign direct investment (FDI). As a result of the technology development process, economic growth is stimulated by more knowledge-intensive industries and higher-technology exports (Box 5.2).

In turn, economic growth enables countries to invest in more and better skills, which helps developing countries move up the global value chain and upgrade their economies.

A skilled workforce is an essential competitive asset for the upgrading of industry. Economies grow as a result of the development of the companies that comprise it, which occurs when existing companies expand and when new companies enter the market. Existing companies expand *via* new investment or productivity gains. The upgrading of the productivity of a company occurs either through gradual improvement in operation processes and the adoption of new technologies (process upgrading), or through the introduction of new products in the market (product upgrading). The incorporation of new companies into the production system usually involves the introduction of more productive processes and technologies in order to have the capacity to compete with national or foreign incumbents. In each of these processes of transformation of the production system, availability of skilled personnel is essential, either because it gives rise to the transformation (through endogenous innovation process) or because the implementation of the new processes requires learning new techniques and developing new skills.

Figure 5.2. **Skills and economic growth: Transmission channels**



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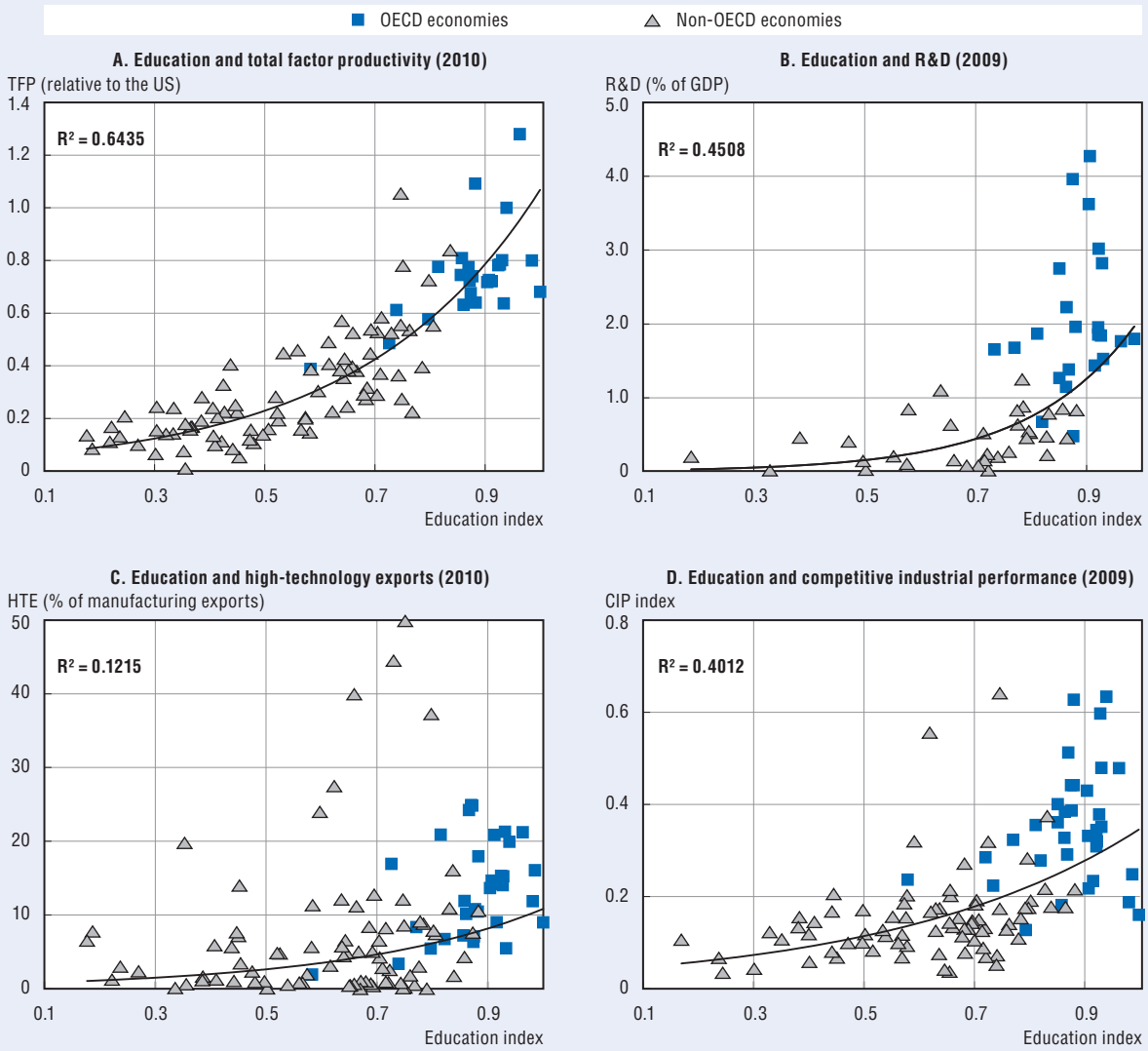
Box 5.2. **Education and technology development**

The link between education and technology development is illustrated by Figure 5.3, which shows the relationship between the education index and four measures of technology development: total factor productivity (Figure 5.3A), R&D (Figure 5.3B), high-technology exports (Figure 5.3C), and competitive industrial performance (Figure 5.3D).

The education index is measured by the adult literacy rate (with two-thirds weighting) and the combined primary, secondary and tertiary gross enrolment ratios (with one-third weighting). Total factor productivity measures are in projection levels relative to the US expenditures in R&D and are expressed as a share of GDP. High-technology exports are products with high R&D intensity and the competitive industrial performance (CIP) index is a combination of four variables: manufacturing value added per capita, manufacturing exports per capita, industrialisation intensity and the export quality.

Figure 5.3. **Education and technology development**



Source: Authors' calculations based on UNDP (2011), *Human Development Indicators 2011*, UNDP for the education index, World Productivity Database, UNIDO (2012) *UNIDO INDSTAT2* (database), United Nations Industrial Development Organization Industrial Statistics Database for total factor productivity (TFP), World Bank (2012b), *World Development Indicators* (database), *http://data.worldbank.org/indicator* for R&D expenditures and high-technology exports (HTE), and UNIDO (2012) for CIP index.

StatLink *http://dx.doi.org/10.1787/888932813611*

Box 5.2. **Education and technology development** *(cont.)*

In the four cases, the link is positive and significant, thus confirming that differences in education widely explain technological performances. Total factor productivity shows the strongest positive correlation with the education index, suggesting that education can play an important role in enhancing productivity in developing economies. Investment in R&D and the industrial performance of countries are also strongly associated with education levels. In spite of a relatively low significance, high-technology exports show a positive relationship with education as well. When disaggregated by level of education, tertiary education has the strongest impact on technology development, in particular with regard to R&D and high-technology exports.

Participation in emerging global value chains is an opportunity whose exploitation demands a special effort in skills development. An important feature of the current global context is the emergence of global value chains, whereby products are produced through multiple activities executed by many enterprises in different places in the world. In this context, a major industrial policy objective is to enter into the global value chain, or upgrade the positioning of national companies in it, as a mechanism to increase exports and, simultaneously, acquire new skills (Box 5.3). The ability to enter new value chains, doing activities previously unknown in the country, and venture into more demanding segments or simply maintain positions in segments subject to high competition, raises specific challenges. In some cases, multinational companies shift to developing countries increasingly sophisticated activities, such as offshore services, design and R&D (Figure 4.2 in Chapter 4). Not only are these activities skills-intensive, they also offer significant opportunities to learn from international good practices. A country such as Costa Rica, for instance, which has invested significant resources in secondary and tertiary education, has taken advantage of such knowledge transfers. Industrial policies that aim at easing structural transformation processes can benefit from this new setting to insert the economy into the highest segments of the global value chains to which it belongs or into new value chains that require more and better skills.

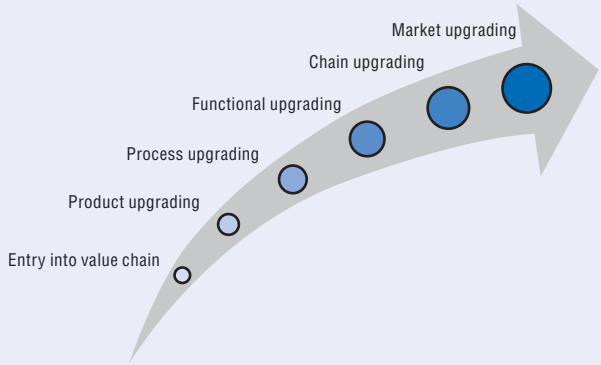
Skills requirements partly depend on the position of each country in the value chain. Figure 5.4 highlights the stylised patterns related to global value chains and skills. Even though such a schema is, by nature, overly simplistic it identifies the main skills needs of a country, based on its position, at a certain moment, in the value chain:

- Low-value entry levels of GVCs, such as production or assembly, typically rely on a large number of manual labourers. While these workers generally lack formal education and are often characterised as unskilled, there is an intense focus on "on-the-job training", which contributes significantly to productivity and competitiveness. At this stage, the supervisory role is critical for knowledge transfer. Managers and quality controllers also play important roles here, as they do throughout the chain. These three job profiles are generally in high demand and low supply and are referred to as "bottleneck positions".
- Mid-levels of the value chain, which entail some processing and/or performance of new and more sophisticated activities, require a more skilled labour force. Generally, these workers must possess specific technical competences.

Box 5.3. **Industrial organisation and global value chains**

The global value chain (GVC) framework helps towards an understanding of how industries are organised by examining the structure and dynamics of the different actors involved (Fernandez-Stark et al., 2012). This sector-specific approach looks at labour inputs, technologies, standards, regulations, products, processes and markets in specific industries and international locations, thus providing a holistic view of industries both from the top down and the bottom up. By breaking down the industry into key segments, it helps countries identify the specific activities in the chain that their firms currently perform, as well as potential opportunities for these firms in the future (Gereffi et al., 2011). The GVC approach also contributes to improving the match between the skills provided in developing countries and those required by industry.

A value chain describes the full range of activities that firms and workers around the globe perform to bring a product from conception to production and end use. Adding value to production or shifting to higher value activities to increase the gains (e.g. security, profits, value-added, capabilities) from participating in global production is referred to as economic upgrading (Gereffi et al., 2005). This includes six distinct changes in the firm's participation in a production model:

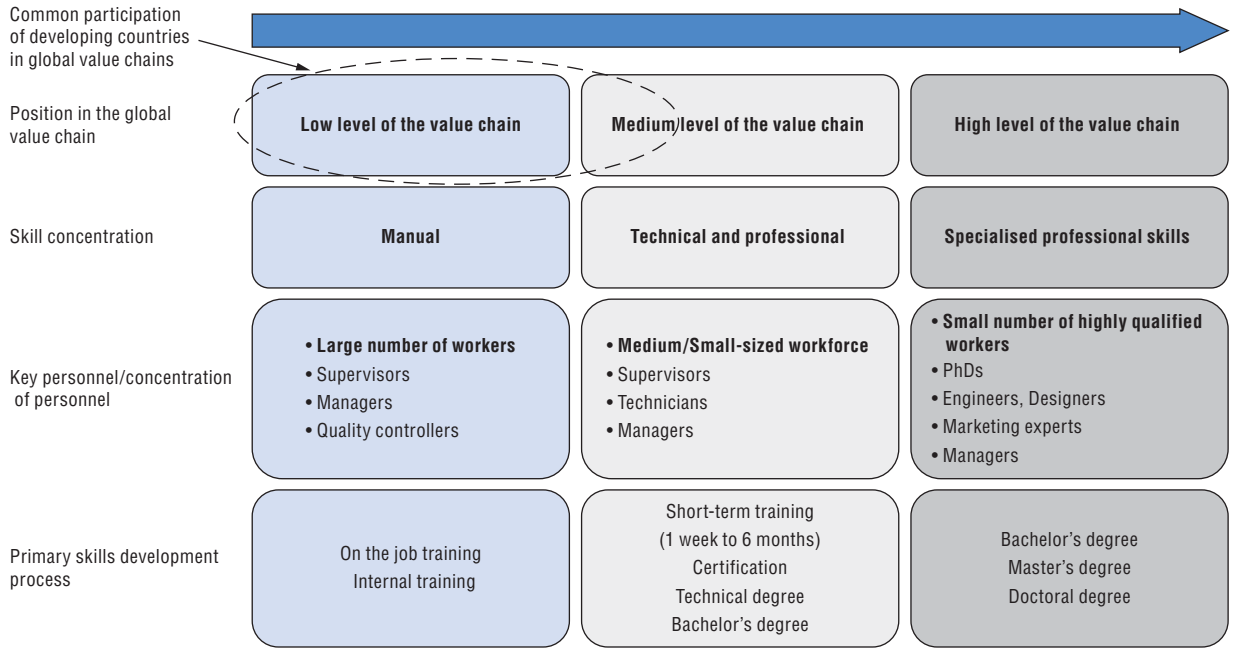


- **Entry into the value chain:** when a new actor begins to participate in the value chain.
- **Product upgrading:** shift into the production of a higher value product.
- **Process upgrading:** improvements in efficiency in the production systems, such as the incorporation of more sophisticated technology.
- **Functional upgrading:** movement to higher value stages in the chain that require additional skills.
- **Chain upgrading:** entry into a new value chain by exploiting the knowledge and skills acquired in the current chain.
- **End-market upgrading:** incursion into new higher value end-market segments, which may involve geographic or industry shifts, such as textile suppliers moving from clothing manufacturers to customers in the medical, defence or construction industries.

For many developing countries, especially low-income nations, the ability to insert effectively into GVCs is vital because it has the potential to generate more and better jobs and reduce poverty levels. As developing countries open their borders to foreign investment, local firms must compete with a growing number of foreign firms for the local market and are forced to improve the efficiency and quality of their supply chains. Appropriate worker skills are therefore essential for industry upgrading. While workforce development alone is not a sufficient factor to catalyse upgrading, it is a common requirement that emerges across all sectors for entering and upgrading in GVCs.

Source: Fernandez-Stark et al., 2012.

Figure 5.4. **Global value chains and specialised professional skills**



Source: Fernandez-Stark, K., P. Bamber and G. Gereffi (2012), "Upgrading in Global Value Chains: Addressing the Skills Challenge in Developing Countries", *Background Paper*, OECD Development Centre.

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- The highest segments of the value chain tend to be knowledge-intensive, requiring specialised skills to perform complex activities and the core labour force must usually hold tertiary education degrees.

This does not mean that countries – or companies – at the low level of the value chain do not need high-skilled workers or that those at the highest level do not require low-skilled workers. But, in general, these are the main trends.

Both developed and developing countries participate in global industries. Developing countries are typically concentrated in the low to medium value-added activities of the chain, while rich economies tend to participate in the higher levels of the chain, thus capturing more value. Given their actual position in the value chain, developing countries demonstrate an imbalance between technical and university level education. Technical education is crucial for upgrading industry in developing countries. Technicians are critical in the middle part of the value chain and if those segments are not fully supplied upgrading is difficult to achieve.

Technical education is the weakest link for many developing nations and serious structural problems have undermined the effectiveness of educational institutions in this area. Challenges include lack of quality, difficulties in teaching the skills demanded by the private sector and a lack of prestige compared to universities, where technical education is perceived to have low status and low income potential (de Moura Castro and García, 2003; Song Seng, 2008). At the same time, there is heavy emphasis on university education and there has been a proliferation of new universities in developing nations (Fernandez-Stark et al., 2010). Latin America, for example, lags far behind the United States and Europe in

developing one-year and two-year technical courses, and enrolment rates in universities are much higher than those in technical education institutions (de Moura Castro and García, 2003).

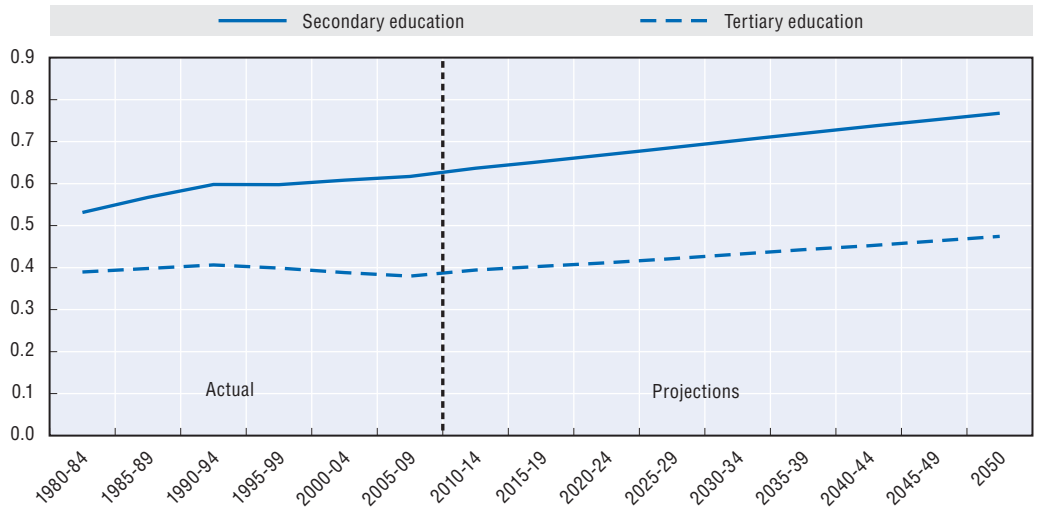
How skills mismatches affect developing countries

Education in developing countries has significantly improved over the last decades, in terms of both quantity and quality. As a result, the education gap between OECD and non-OECD countries has tended to narrow. But such improvements do not always translate into a better match between the supply of skills and the demand for them. In fact, most developing countries suffer, in a higher proportion than OECD countries, from mismatches in their labour markets. These skills mismatches affect both the productivity of companies and the labour conditions of workers.

Catching up on education

Non-OECD countries are closing the education gap. Figure 5.5 shows the projected ratios between education levels in non-OECD and OECD countries between 1980 and 2050. Over the period 1980-2009, the secondary education ratio went up from 0.53 to 0.62 (+17%). By contrast, the tertiary education level was relatively stable around 0.39. Projections made by Fouré et al. (2012) show that the situation should progressively change with secondary and tertiary education ratios of, respectively, 0.77 and 0.47 in 2050 (+24% compared to 2005-09).

Figure 5.5. **Ratios between education levels in non-OECD and OECD countries, 1980-2050**



Notes: OECD countries are the 34 members of the organisation in 2012. The ratios of secondary and tertiary education measure the average enrolment rate in non-OECD countries against the average enrolment rate in OECD countries.
Source: Authors' calculations based on Fouré, J., A. Bénassy-Quéré and L. Fontagné (2012), "The Great Shift: Macroeconomic Projections for the World Economy at the 2050 Horizon", *CEPII Working Paper*, No. 2012-03, CEPII.

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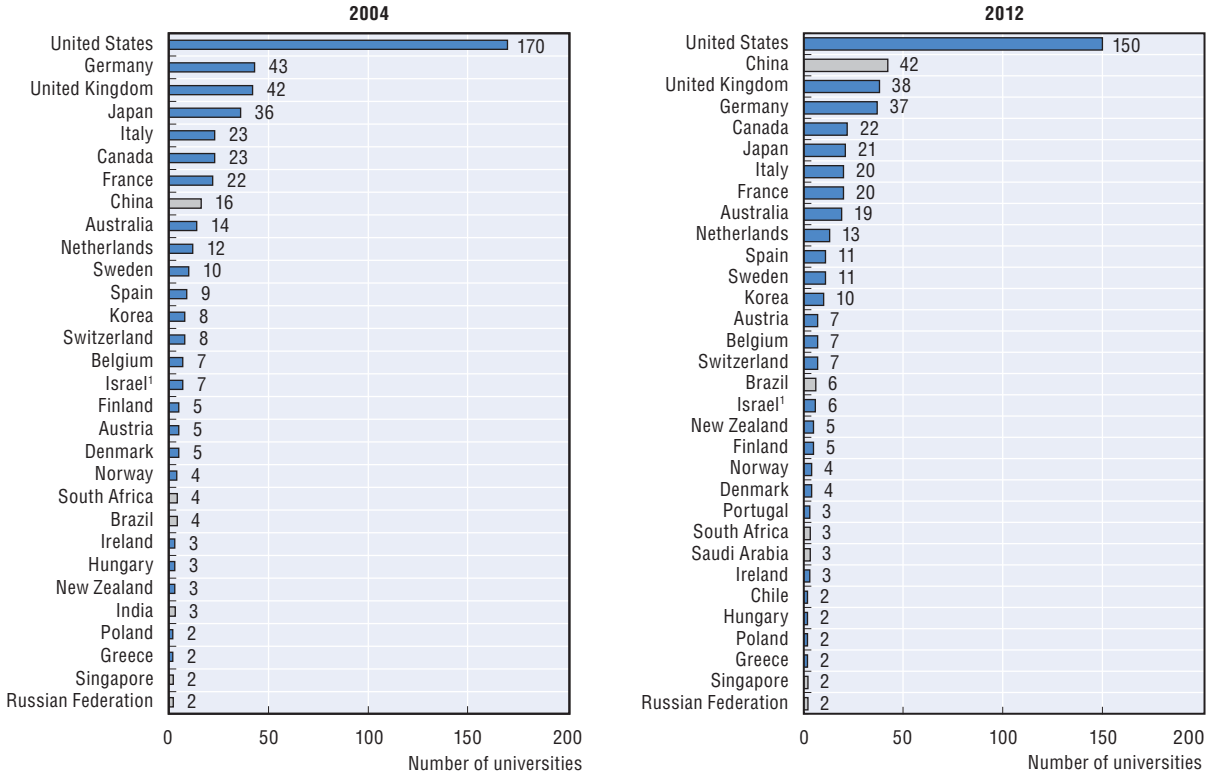
Although the education gap is still substantial, many developing countries have significantly invested in human capital over the last decades. Thus, besides OECD countries, where tertiary education increased by 129% between the 1980s and the 2000s, tertiary enrolment more than doubled in the Middle East and North Africa (MENA) (+141%),

in Latin America (+117%) and in East Asia and the Pacific (+116%). In sub-Saharan Africa, enrolment rates rose by 62% over the same period.

As a result, non-OECD countries have significantly improved their performances in terms of education. One interesting illustration is provided by the results in the Programme for International Student Assessment (PISA). On average, all participating countries improved their average results (reading, mathematics and science) by 1.2% between 2006 and 2009. However, OECD countries only increased their results by 0.5% on average, while non-OECD countries registered an increase of 1.9%. Eight out the ten countries that most improved their results are partner countries: Brazil, Bulgaria, Colombia, Kyrgyzstan, Qatar, Serbia, Romania and Tunisia (the other two being Portugal and Turkey). It is also noteworthy that three out of the five top performers in the PISA tests in 2009 were non-OECD countries: Shanghai, China; Hong Kong, China; and Singapore.

The improved position of several universities from non-OECD countries in academic rankings is characteristic of the trend observed as part of the shifting wealth phenomenon. Figure 5.6 shows the number of universities by country among the top 500 world universities.[4] While in 2004, only 32 universities from non-OECD countries were ranked among the top 500, 58 belonged to the elite in 2012 (+81% in eight years). Among them, Chinese universities have particularly increased their international prestige (16 universities among the top 500 in 2004; 42 in 2012), China now being the second best ranked country. Besides, countries such as Brazil (four universities in 2004; six in 2012), Saudi Arabia (three

Figure 5.6. **Academic ranking of world universities (ARWU), Top 500**



Notes: This figure shows the number of universities a country has among the top 500 universities in the world.
Source: Authors' calculations based on ARWU (2012), "Academic Ranking of World Universities" (Shanghai Ranking Consultancy; ARWU), *www.arwu.org*, accessed 12 November 2012.

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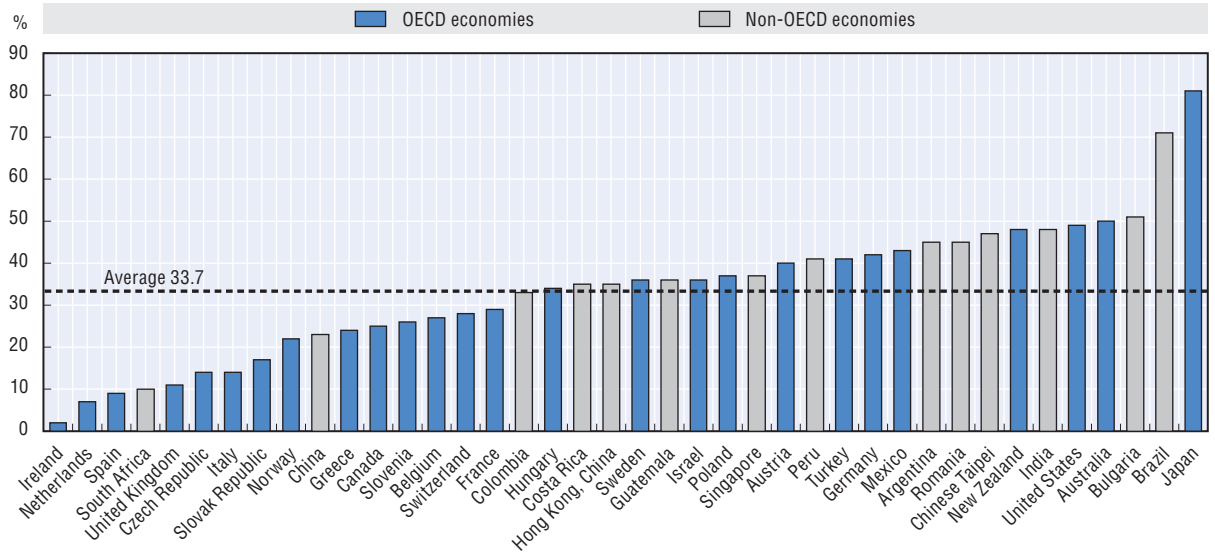
universities in 2012) and South Africa (three) are doing as well or even better than several OECD countries.[5] Even a country such as Singapore, with only 5 million inhabitants, has two universities among the Top 500.

Even when governments have invested massively in human capital, there is no guarantee that the skills imparted correspond to the needs of the economy (OECD, 2012a). Figure 5.7 illustrates the percentage of employers reporting difficulty filling jobs in 40 countries in 2012. It is striking that some of the best ranked nations according to PISA face skills shortages. This is particularly the case of Southeast Asian countries, namely Hong Kong, China; Singapore; Chinese Taipei and Japan, characterised both by good levels of education and a high proportion of employers having problems filling jobs. This suggests that there is no direct relationship between the quality of education and the capacity of the labour market not only to absorb, but also adequately to use, existing skills.

Figure 5.7. **Percentage of employers reporting difficulty filling jobs, 2012**



Notes: The Talent Shortage Survey lists only the top ten job titles identified by employers as in demand. Many other job titles could have also been identified by employers as difficult to fill, but not in quantities that exceeded the ten job titles listed.
Source: Authors' calculations based on Manpower Group (2012), *Talent Shortage Survey Results 2012*.

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Skills mismatches in developing countries

Massive protests in the Arab world in 2011 were largely rooted in dissatisfaction among young people, who in spite of relatively high levels of education face serious problems of unemployment (OECD, 2012d). Although skills mismatches do not always entail such dramatic consequences, it is true that both skills shortages and surpluses have negative effects not only in terms of labour productivity and economic growth, but also with respect to human capital.

Skills shortages

Skills shortages occur when the demand for skills exceeds the supply. This situation particularly affects low-income countries, especially in sub-Saharan Africa, where not only individuals with tertiary education, but also workers with vocational or technical qualifications, remain in short supply. This situation may be the origin of a vicious circle as

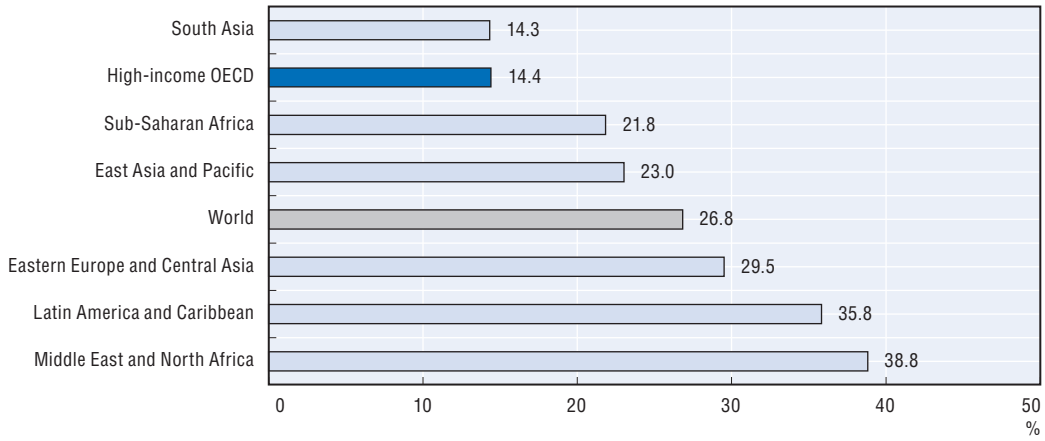
poor countries fail to meet the demand for skills, in particular in mid-level jobs, as a result of a lack of financial capacity to invest in adequate education, which in turn damages growth potential and prevents further investment in education (Banerjee and Duflo, 2011).

Skills shortages do not only affect poor countries with low financial capacity; they are also a concern in emerging economies. Fast-growing economies face several competitiveness challenges, such as increased international competition, growingly complex global value chains, ever shorter product life cycles, and accelerating technological change. Firms need to adapt quickly to this unstable environment and, as a result, the demand for skills is rapidly changing. On the other hand, investing in skills takes time. The probability of suffering from skills shortages increases, therefore, in fast-growing economies.

Skills shortages particularly affect Latin American and Middle Eastern and North African (MENA) countries. Measuring skills shortages is sensitive because what employers report is their difficulty in filling vacancies, given working conditions (that is, wages, but also work hours and other non-wage benefits and work arrangements). Figure 5.8 constitutes, however, a good illustration of skills shortages worldwide as it shows the percentage of firms considering an inadequately educated workforce to be a major constraint. All regions in the world, with the exception of South Asia (14.3%), appear to suffer more from skills shortages than high-income OECD countries (14.4%). This is especially striking in the cases of Latin America and the Caribbean (35.8%) and the Middle East and North Africa (38.8%), especially because these regions are also concerned by skills surpluses.

Figure 5.8. **Firms identifying an inadequately skilled workforce as a major constraint, 2010**

Percentage of total firms per region in the survey



Notes: The indicator represents the percentage of firms per region identifying labour skills level as a major constraint. The computation of the indicator is based on the rating of the obstacle as a potential constraint to the current operations of the firm.

Source: Authors' calculations based on World Bank (2012a), *World Bank Enterprise Survey*, World Bank, Washington, DC. To download the data corresponding to this graph, refer to Figure 0.4.

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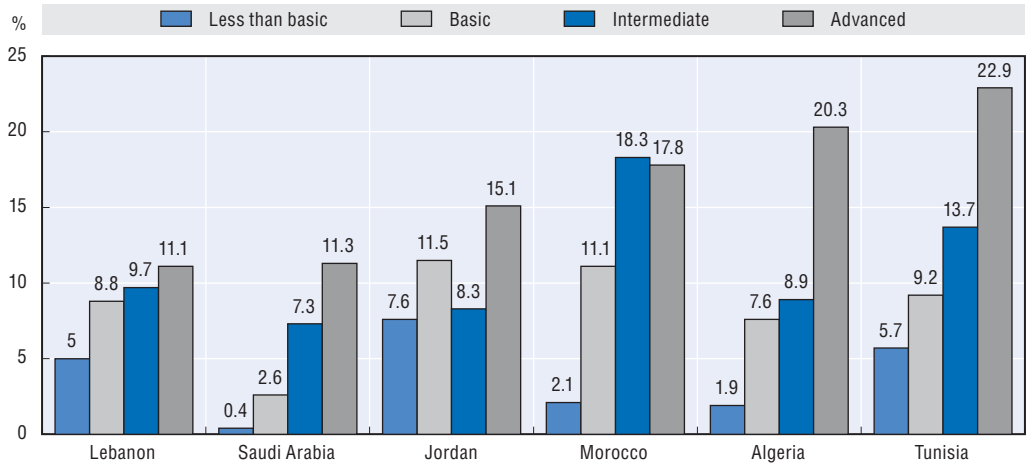
Skills surpluses

Skills surpluses affect economies characterised by an excess of supply over demand. In a number of developing countries, in particular in Latin America and North Africa, the stock of high-skilled people is greater than what the labour market can absorb, thus translating into high unemployment rates. In this respect, Figure 5.9 illustrates the positive

and counterintuitive relationship between the education level and the unemployment rate in six MENA countries in 2010. The most highly educated are also those who suffer most from unemployment. This situation reflects the problem of over-qualification faced by a growing number of young people in countries whose firms' competitiveness do not rely on the intensity of knowledge, but rather on low labour costs (see below).

Figure 5.9. **Unemployment rates by education level in selected MENA countries, 2010**



Source: Authors' calculations based on ILO (2011a), *Statistical Update on Arab States and Territories on North African Countries*, ILO Department of Statistics, International Labour Organization, Geneva.

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Skills shortages and surpluses are not incompatible. In several MENA countries, for instance, the share of firms identifying an inadequately educated workforce as a major constraint is very high (Figure 5.8), as is the unemployment rate of the most educated (Figure 5.9). This frustrating situation partly explains why young people have been leading the revolutionary process in the region (Chevallier, 2011).

Main determinants of skills mismatches

In many developing countries, the supply of skills does not meet the demands of the labour market. Low funding is part of the explanation, since many poor countries do not have the financial means to invest massively in education and training. Yet there is no direct link between GDP per capita and the efforts made by a country in terms of education. Burundi, Comoros and Lesotho, three of the poorest countries in the world, rank among the ten countries with the highest ratios of public spending on education to GDP per capita: 7.2%, 7.6% and 13%, respectively, in 2008. This is less than Cuba (14.1%) but very similar to the levels of public investment in Denmark (7.7%), Iceland and Switzerland (7.5%). By contrast, some of the richest states in the world register very low ratios: 0.8% in the United Arab Emirates, 2.1% in Liechtenstein and 2.4% in Qatar.

More resources and higher enrolments do not always come with quality. In this respect, there is no significant correlation between the performances of a country in the PISA tests and the investment in education (OECD 2011a). It is, accordingly, striking that the Millennium Development Goals (MDGs) set objectives in terms of quantity (achieve universal primary education),[6] but do not focus on what students actually learn. Teacher

absenteeism rates are relatively high in many developing countries, in particular in rural areas, while incentives for qualified people to teach are generally low, thus affecting the quality of education, not only in the public but also in the private sector (Banerjee and Duflo, 2011).

The relative cost of skills also affects their supply. Some skills are more costly to build than others. In general, technological and scientific careers entail much higher fixed costs than is the case with the social sciences, and therefore require more financial means. Tuition fees should therefore be significantly higher for technological and scientific careers. However, the return on investment for students, as measured by the wage premium in the labour market, does not always justify spending more money. If the state does not directly provide or subsidise these careers, educational institutions will either prefer to develop less expensive disciplines, such as the social sciences, the humanities and law, or will charge above-average tuition fees. In both cases, the supply of skills may not correspond to the needs of the country.

Skills mismatches are also related to a lack of information and transparency. In many cases, parents and students do not have enough information about the skills required in the labour market. This may explain, for instance, the lack of demand for vocational training in many developing countries, in spite of its benefits both for the workers, who can more easily enter the labour market, and for the companies, which can find more suitable workers. Educational institutions themselves do not always train their students according to the needs of the labour market. This disconnection is often the result of a lack of co-operation between educational institutions and employers. Problems of information also explain why the transition from school to work is likely to be longer than expected. In particular, they translate into low internal mobility, as it is often difficult – and sometimes expensive – to find information about labour conditions in other areas of the country. Bad infrastructure, high domestic transportation costs and religious, linguistic or ethnic fragmentation also contribute to curbing geographical mobility in many developing countries.

Problems of discrimination in the labour market, in particular against women, also contribute to widening skills mismatches. Even if female enrolment rates at all education levels have improved over the last decades, girls remain disadvantaged, in particular in Southern Asia and sub-Saharan Africa. Differences between countries are partly due to social norms and cultural traditions, which affect education choices and become constraints on women's decisions to pursue careers, regardless of their ability to enter the labour market (OECD, 2012c). This is especially the case of early marriage, which has a strong adverse effect on girls' educational attainment (OECD, 2010b). The fields studied by men and women also differ significantly, in particular at the tertiary level. While in many countries the health sector is more female-oriented, engineering and computing, for instance, are dominated by males (OECD, 2012b). These gender-biased education decisions affect the supply of skills and are an additional cause of skills mismatches in developing countries. In the same way, discriminations related to ethnic or social origins prevent talented people from acceding to adequate jobs, generating not only social but also efficiency costs (OECD, 2011a).

Skills mismatches can also be induced by the lack of adaptability and training of the workforce. The fact that skilled people can find a job that corresponds to their skills at a given moment does not mean that they will not face problems in the long run. The demand

for skills evolves very quickly, above all in a context of increased international competition and accelerating technological change. If initial training is too specialised, there is a risk that workers will not be able to adapt to the new conditions. In this respect, Hanushek et al. (2011) show that while vocational training helps build skills that ease the school-to-work transition, its long-run effects are more uncertain. Their detailed cross-country analysis of the life-cycle work experience shows in particular that individuals receiving vocational education enter the labour market more easily at the beginning of their careers but register lower employment rates at older ages than those who received a general education. This can be explained by the lack of on-the-job training or other forms of adult learning opportunities.

Employers also have a share of responsibility for the skills mismatch, as they do not always know how to take the best advantage of their employees' knowledge and competences. In a rigid labour market, where workers have difficulties changing jobs, the misuse of skills contributes to rising dissatisfaction among workers, thus affecting labour productivity. But even in the presence of flexible labour institutions, this situation generates a high turnover, which also has an impact in terms of the productivity of companies (OECD, 2012a). The misuse of skills is common in countries that have invested massively in education, in particular tertiary education, but still find themselves at a relatively low level of the value chain (Fernandez-Stark et al., 2012). Many developing countries are trapped in international specialisation based on low skills, relying on comparative advantages arising from cheap rather than skilled labour. This is the case, for instance, in most MENA countries, which combine high numbers of tertiary-educated people with high unemployment rates among the most educated (Figure 5.9).

The negative effects of skills mismatches

Skills shortages have a cost in terms of labour productivity. These shortages mean that firms cannot use the most efficient technologies and working methods (OECD, 2012a). In addition, they generate bottlenecks that make it more difficult to satisfy demand, both domestic and foreign. They also jeopardise the participation of affected countries in the highest segments of global value chains, which require increasingly skilled workers. In this respect Fernandez-Stark et al. (2012) show that the supply of management talent for global value chains is scarce. Management at all levels of the organisation affects the competitiveness of firms; in many industries, it plays a key role in providing on-the-job training, which has become an increasingly used training technique. Effective management practices can thus have a significant impact on productivity. The training of managers can affect how they perceive the needs of other employees, how organisational capacity is developed, and the way in which initiatives in human resources management are integrated with business strategy. When good managers are scarce, performance suffers and firms face greater challenges to comply with global requirements.[7]

Skills surpluses affect labour conditions and translate into human capital losses. In the context of a skills surplus, skilled workers face the risk of not finding a job, which translates into high unemployment rates among those with tertiary education, thus affecting their human capital and reducing the probability of finding a job in keeping with their level of education. Skills surpluses also mean that skilled workers who find a job tend to feel over-qualified and experience problems of motivation at work. Turnover then becomes more frequent, thus reducing productivity in the firm. On the other hand, over-

qualification that does not result in turnover induces human capital losses through the depreciation of skills that workers possess but do not use at work.

Skills surpluses translate into a skills waste, since the resources used to acquire skills have been partly or fully lost. This waste of skills may have a long-term effect as the incentive to invest in education might be reduced. The over-supply of engineering graduates in Colombia at the turn of the last century provides one such example. The proliferation of private universities meant that the country was graduating close to 20 000 engineers annually. However, violence and instability, slow economic growth and limited investment in infrastructure translated into weak demand for engineers in the country. As a result, salaries for Colombian engineers dropped significantly, and by 2008 they were the lowest paid in Latin America. Existing firms were forced to seek clients abroad to make up for low local demand and it was estimated that 25% of engineers left Colombia to seek work abroad (Fernandez-Stark et al., 2010).

The waste of skills in developing countries is aggravated by the migration of high-skilled workers from lower to higher-income countries. Brain drain is a worldwide phenomenon, since emigration rates are on average higher for the highly educated than for the total population, including in OECD countries (Widmaier and Dumont, 2011). However, the phenomenon is especially strong in non-OECD countries. In sub-Saharan Africa, for instance, while only 0.9% of the overall population lived in an OECD country in 2005-06, 13.2% of those with tertiary education had left their country. Haiti represents an extreme case, with 75.4% of its highly educated population having migrated in 2005-06. Several middle-income countries are also particularly affected. Thus, the emigration rate of the highly educated is 4.2% in India (0.4% for the total population), 7.9% in the Philippines (4.4% for the total population) and 15.3% in Morocco (9% for the total population). This migration of highly skilled workers is both a symptom and a cause of the economic difficulties of developing countries, in particular those whose industrial development relies on skills upgrading.

Addressing the skills challenge

The failure of many developing countries to develop adequate skills has translated into larger and more frequent mismatches than in labour markets in OECD countries. As a result, firms experience difficulties in finding skilled workers, especially when industries try to improve their market position by scaling up their level in the value chain. Simultaneously, young graduates face severe unemployment problems, making emigration an attractive solution. Because this situation is costly for the countries that face it, both in terms of labour productivity and of human capital, and because it is often the result of a lack of co-operation between the main actors involved, productive development policies need to address the skills challenge. Even though not all countries face the same needs, good practices help an understanding of the main components of successful skills policies in developing countries. In particular, skills development requires a strengthened co-ordination in the skills market.

Factors to consider when designing skills policies

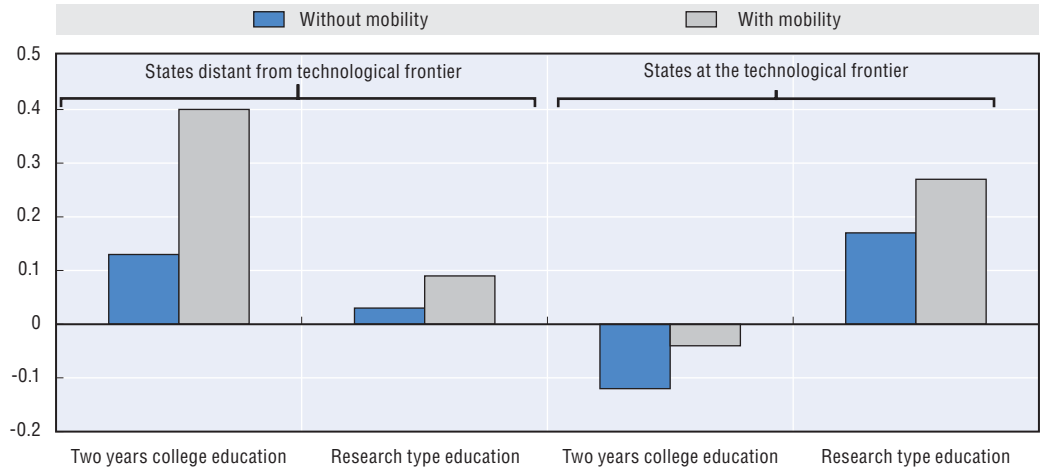
Skills play a central role in productive development strategies. Many developing countries have already adopted strategic reforms to improve both the quantity and quality of skills and reduce mismatches in the skills market. However, a successful reform in one country is not necessarily applicable in the others. Policy makers need to take into account

several factors when designing skills policies: *i)* distance to the technological frontier; *ii)* complexity of the required needs and industrial organisation; *iii)* current versus future needs; and *iv)* private versus social needs.

Distance to the technological frontier

Converging economies follow a development model based on imitation, which does not require the same amount of investment in advanced education. By contrast, countries close to the technological frontier need to innovate, hence to invest massively in higher education (Aghion et al., 2005). For this reason, skills policies should take into account the coherence between investment in skills and technological needs in the economy. Otherwise, inappropriate spending on education could turn out to be a waste of resources. Figure 5.10 illustrates the long-term growth effects of educational spending in the 50 states of the US according to the distance to the technological frontier. 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). Although these results relate to the US, important lessons can be drawn for developing countries.

Figure 5.10. **Long-term growth effects of spending USD 1 000 per person on education, United States**



Source: Acemoglu, D., P. Aghion and Zilibotti F. (2006), "Distance to Frontier, Selection, and Economic Growth", *Journal of the European Economic Association*, MIT Press, Vol. 4(1), pp. 37-74.

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Complexity of the required needs and industrial organisation

Not all investments in skills have the same implications in terms of duration, cost and complexity. In some cases, firms might need workers with specific skills that can be acquired in a short time and at a relatively low cost. In India, for instance, Infosys has its own in-house campus to supply employees with the skills required by the company. In some cases, delays in acquiring specific skills are longer, but the complexity of training workers is relatively low. For instance, if firms need managers speaking foreign languages and the language-training market is not adapted to their needs, they can implement tailored courses with training institutions. But in some cases the upgrading of skills requires a long and complex process, which might imply postgraduate studies. In that case,

the whole education system is involved and more dialogue between industries and educational institutions is required.

The industrial organisation of the country also matters at the time of designing skills policies. On the one hand, some sectors are highly concentrated and as a result existing firms are able to absorb the costs of establishing new training schemes. The existence of a limited number of companies also lowers the risk of workers moving to another company once trained. On the other hand, more fragmented sectors, mainly composed of small and medium-sized enterprises (SMEs) which are not well connected to global value chains, face high co-ordination costs, requiring more public intervention.

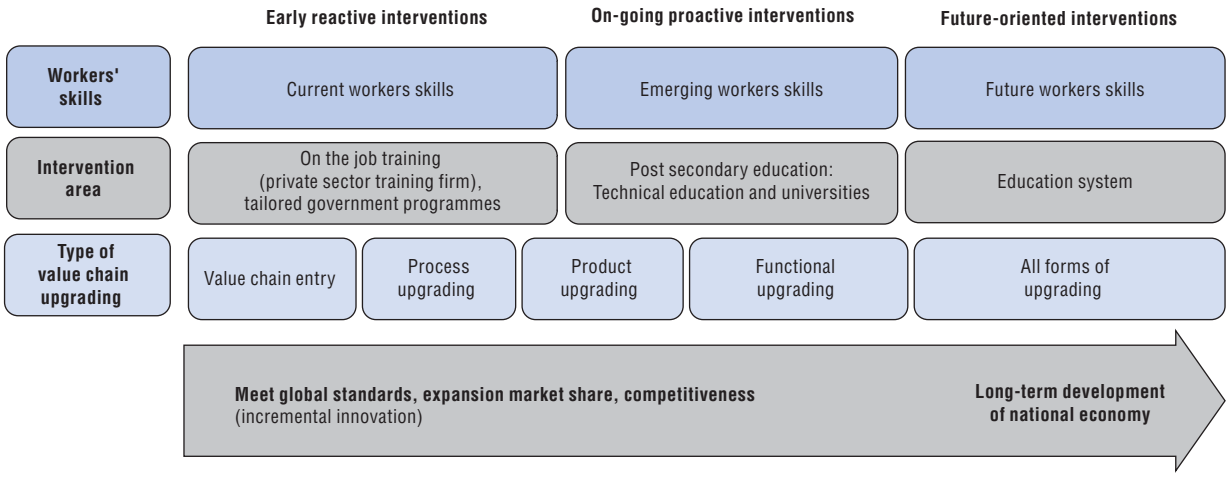
Current versus future needs

One of the main problems in designing skills policies relates to uncertainty about the future needs of the economy. Accumulating skills takes time and for many developing countries building a good education system able to train future workers adequately is already a challenging task. But anticipating the future needs of the economy is almost impossible, above all in a rapidly changing world. As Creticos et al. (2009) explain: "The challenge is in getting the answer on projected absorptive capacity right since jobs do not yet exist because the businesses that create these jobs also don't exist."

Skills policies in developing countries should focus on three main kinds of interventions (Fernandez-Stark et al., 2012), as illustrated by Figure 5.11.

- Early reactive interventions include actions to alleviate the immediate challenges of skills gaps. The main purpose of these interventions is to align the existing supply of skills with the current needs of the economy. This requires, in particular, an industry analysis to assess the position of the country in the global value chain and identify the skills critical to meeting international standards, expanding market share and sustaining competitiveness. Early reactive interventions appear to be more effective when the private sector is directly involved in the training process and the state acts principally as a facilitator.
- On-going proactive interventions seek to prepare the labour force for the upgrading of the economy into the next stage of the global value chain. This requires an industry analysis to evaluate the possible upgrading paths as well as an identification of the critical job profiles in the next levels of the chain. Proactive interventions must sustain growth, enhance competitiveness and promote innovation. In developing countries, workers' skills are typically located in the middle segments of the value chain and demand technical capabilities. Emphasis should be placed on establishing excellent technical education institutions able to deliver relevant skills, as well as local public and private councils in which government, private sector and educational institutions work together.
- Future-oriented interventions focus on the long-term needs of the economy. The main purpose is to create "upgradeable" individuals who have solid basic skills and can be successfully inserted into dynamic global sectors. These future-oriented interventions will drive national economic development supported by a labour force with strong capabilities. They require improvements in skills for workers from early ages, including primary and secondary, technical and advanced education.

Figure 5.11. **Typology of skills development policies**



Source: Fernandez-Stark, K., P. Bamber and G. Gereffi (2012), "Upgrading in Global Value Chains: Addressing the Skills Challenge in Developing Countries", *Background Paper*, OECD Development Centre.

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Private versus social needs

Beyond the fact that anticipating future needs is virtually impossible, a skills strategy that only focuses on private needs might generate high costs for society. Although providing adequate skills to the economy is fundamental, developing countries must also take into account social needs. In this respect, the demand for graduates in philosophy or literature is generally low in the private sector. Yet these skills are necessary in a society, as is also the case with the health and education sectors, which tend to be overlooked by productive development strategies. But a society that does not value its health professionals and its teachers is likely to suffer from serious human capital losses. In this respect it is slightly paradoxical that countries wanting to develop a skilled workforce do not invest more in teachers, for instance, by offering pay that corresponds to their role in society.

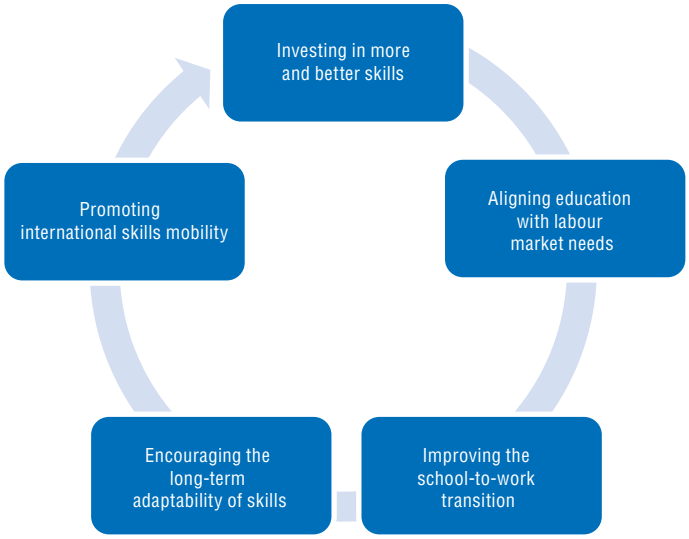
Skills policies for productive development: Good practices

Policy makers in developing countries need to rethink their skills strategies and adopt an agenda that includes five main priorities (Figure 5.12): *i)* investing in more and better skills; *ii)* aligning education with labour market needs; *iii)* improving school-to-work transition; *iv)* encouraging the long-term adaptability of skills; and *v)* promoting international skills mobility.

Investing in more and better skills

The first priority of skills policies is to create not only more skills but also better ones. To this end many developing countries have invested a great deal in education over the last decades. Public education is widely available in most countries and many social programmes have helped bring in more students by making education cheaper. This is especially the case of "conditional cash transfers", which, following the Mexican *Progresa* programme (now called *Oportunidades*),[8] have helped many poor children from developing

Figure 5.12. **Priorities in skills development policies**



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countries go to school. Many countries have also worked to reduce teacher absenteeism, mainly through a combination of monitoring and incentives (Karlan and Appel, 2011).

More resources, higher enrolment rates and lower absenteeism, on both the student and teacher sides, are necessary but not sufficient to build solid skills. Quality of education, beginning with universal basic education, is essential. In this respect, small classes and highly-qualified (and well-paid) teachers play a significant role in enhancing student achievement (Banerjee and Duflo, 2011; UNDP, 2001). The state can also play an important role in ensuring the quality of training through accreditation of universities and technical institutions, without limiting the necessary flexibility to modify curricula in response to labour demands.

Training of the academics who will work in technical training centres and universities in the future is important and essential for the expansion and training of new technicians and professionals. Training personnel at high levels generally demands large amounts of public resources, something that entails a high opportunity cost in developing countries. This deepens the need to study rigorously which areas need strengthening. Similarly, selection processes must be soundly based on academic and professional criteria and have to be developed in a transparent environment. Likewise, with the aim of securing a return on investment, there is a need to establish a set of conditions which guarantee that funded researchers have to return to their home countries and take part in high-value activities.

Competency certifications reduce transaction costs related to recruitment and selection, and the level and portability of skills can be increased for certified workers, thereby facilitating labour mobility (Gereffi et al., 2011). The establishment of a competitive labour market is also encouraged, based on the level of skills rather than contacts or perceptions of skills. Certification systems are more efficient when public authorities work with industry associations and educational institutions. Success is particularly conspicuous where skills are aligned with international standards requirements.

Co-operation programmes can contribute to improving the quality of skills. In the framework of the partnership between France and Tunisia, the French National Agency for Adult Training (AFPA) runs a project in Tunisia that supports the professional training of

more than 1 500 trainers and training consultants in the priority sectors through enhancing their level of qualifications, competences and technical performance. Since 2009 more than 50 training sessions have taken place and those participating received special training in French companies selected by the AFPA. After evaluation they obtained official certifications.

Attracting FDI can be another strategy to invest in more and better skills (Box 5.4). Countries are looking at the new forms of FDI as learning opportunities. Attracting investment in the medium and upper end of production requires offering firms more than fiscal incentives. Skills and competences are crucial. Countries need to provide human resources of a quantity and a quality that match the requirements of companies.

Box 5.4. **Foreign investment attraction and industrial upgrading**

Policies aimed at fostering skills linked to the attraction of investment operate at three distinct levels. The first focuses on creating a basic workforce that possesses the necessary skills to operate and produce in the sector of the global value chain to which the country wants to attract investment. This generally entails strengthening the training supply in the sector in which skills are demanded. This type of action involves a certain amount of risk in the selection of a training agenda, which can be lessened by implementation of rigorous analyses, wide and flexible training programmes and a continuous monitoring of the level of labour absorption by targeted firms.

The second level focuses on the creation of specific competences that the targeted firms require; this usually takes place through on-the-job training or through corporate training programmes. Government programmes seek to attract investment and usually include grants within their financial incentive packages to firms that partially cover the costs of training. This stimulates the establishment of companies in the country and consequently generates employment. Moreover, it tailors the local labour force skills to match the demands of firms.

In this respect, Morocco provides a good example in building capacity in the car industry. In March 2011, Tangier saw the inauguration of a training centre for professionals in the car industry sector (*Centre de Formation aux Métiers de l'Automobile, Tanger Méditerranée, CFMA/TM*). The creation of this centre was one of the measures of the national industrial policy (National Pact for Industrial Emergence) that provides for the creation of 220 000 new jobs in six strategic sectors, including 70 000 in the car industry alone between 2009 and 2015.

The third level aims to shift the country's production activities to a higher level. This can take the form of upgrading the final product, improving the efficiency of production systems or shifting towards higher stages in the value chain which require more advanced or additional skills. Another important aim at this level is to increase the number of national firms linked to the new sector, either as suppliers to multinational corporations or competitors. The identification of skill requirements has to be determined hand in hand with the strategies of the firms involved as well as co-ordinated with the active participation of educational bodies (universities and/or technical training centres).

For instance, Costa Rica recently approved a PhD course in software engineering at the Technological Institute (ITCR) and a PhD in computer sciences at the University of Costa Rica (UCR) to respond to the growing needs for more technology-related disciplines. The role of public policy at this level is directed towards facilitating the process of identifying skills and needs through the promotion of dialogue between relevant stakeholders, developing diagnoses and possibly by facilitating the establishment of training programmes within educational bodies through financial help and/or political support.

Box 5.4. **Foreign investment attraction and industrial upgrading** *(cont.)*

As multinational corporations gradually shift more sophisticated production processes to developing countries, skills policies play an increasingly important role in the attraction of investment. FDI attraction is increasingly being determined by local knowledge assets, such as a skilled labour force, proximity to emerging markets and information on consumer trends in countries with rising internal demand.

Aligning education with labour market needs

Upgrading the volume and quality of training in parallel with productive development strategies is crucial. Scientific and technological capabilities are required both to sustain the upgrading of the domestic production structure and to interact better with foreign partners. To foster coherence between education supply and labour market needs, students should be encouraged to enrol in fields such as engineering, science and technology. In this respect, countries such as Korea and Singapore constitute good examples of how education systems can be better oriented towards the needs of the labour market, in particular by developing technology-oriented curricula at higher levels (UNDP, 2001).

Vocational training should also be a priority of skills policies in developing countries. By way of illustration, China has developed a strategy to attract students to technical and vocational education and training (TVET) and pre-employment training programmes. The government provides financial subsidies to students from poor families. In Guangdong province, for instance, the local authorities provide an annual grant to students of CNY 1 500 (Chinese renminbi), or around EUR 184 (USD 240) at March 2013 values, to cover costs for their first two years of study. During the third year students receive payments from companies in their work programme. Depending on the level of local economic development, students may benefit from higher subsidies if the local government is willing to provide them. In addition, the youth pre-employment training programme offers school leavers aged 15-19 training in interpersonal skills, including leadership, self-discipline, team building, computer literacy and vocational skills. The programme is combined with subsidised on-the-job training to increase employment opportunities. Employers are subsidised to appoint mentors to help trainees.

Industry associations represent a broad range of firms and can provide more comprehensive information for developing a well-rounded workforce than individual firms working alone (Fernandez-Stark et al., 2012). These associations are extensively involved in driving the development of the workforce for upgrading. Initiatives carried out by them include identifying industry job profiles and their required competences, creating internal training programmes, and partnering educational institutions to tailor training and modify existing curricula for current and potential workers. Where training resources are not available locally, these associations establish alliances with foreign universities to accelerate the skills development process. For example, in the Philippines the industry association for offshore services has worked with Harvard Business Publishing[9] to establish a management course, combining online and classroom activities, to improve the performance of supervisors and managers.

Box 5.5. **Fostering skills and competences for the creation of knowledge-based start-up companies**

Although financial support and a suitable regulatory framework are necessary conditions for the creation of knowledge-based start-up companies (KBSCs) entrepreneurial capabilities and technical skills are decisive in fostering their development. These skills are particularly important not only for successful management of the new firms but also for building relationships with other actors within the national innovation system. Entrepreneurial skills are generally acquired through a process of learning-by-doing. A key factor is previous entrepreneurial experience, but there are ways in which the public sector can support the process of capability accumulation (OECD, 2013).

In Brazil, for instance, both the National Service for Industrial Learning (SENAI) and the Brazilian Support Services to Micro and Small Firms (SEBRAE) are examples of successful institutional support mechanisms for the building up of skills and competences for entrepreneurship. The latter offers a wide variety of free and subsidised courses in financial planning, innovation management and human resources management among other instruments. Similarly, the Colombian Virtual Entrepreneurial Thinking Lectures (*Cátedras de Pensamiento Empresarial*) by the Colombian Training Institute (SENA) are another example of a government's efforts to foster skills development. This initiative provides innovative entrepreneurs with a free online community platform to access a set of online courses which are typically 40 hours long and divided into different lectures, ranging from technical fields such as programming to management techniques, particularly in the field of knowledge-based assets. At the same time, the Colombian Foreign Trade Bank (BANCOLDEX) has recently set up the iNNpulsa Colombia programme, which fosters the creation of KBSCs by offering an integrated support to entrepreneurs, from skills development programmes to financial support (OECD, 2013).

The private sector is increasing its role in skills development in this area. For instance, the role of business angels is shifting from one of being strictly providers of capital assets to becoming a source of knowledge and networks of contacts to new entrepreneurs from which they can benefit and learn. In addition, inter-firm co-operation for sharing knowledge and skills is a rising phenomenon, especially among new innovative start-ups. The Campinas association of start-ups in Brazil is a good example in the way it provides a space for knowledge-sharing for co-operative problem solving (see Chapter 4). Fostering skills and competences for the creation of start-ups and innovative entrepreneurs is therefore a multifaceted task that involves not only the public and private sectors implementing direct targeted measures but also entrepreneurs themselves and their capacity to share and absorb knowledge.

Improving the school-to-work transition

Internships and apprenticeships are instruments that facilitate the insertion of skilled students into the labour market. On-the-job training can also help improve the employability of skilled workers and help reduce skills mismatches. In Chile, for instance, the National Service for Training and Employment is in charge of co-ordinating and operating a programme aimed at increasing the chances of employment for young people from poor families. Firms assume a tutoring role and provide work experience, ensuring that training is easily adapted to the local labour market demand.

States should play a major role in easing access to labour market information, which helps drive upgrading by matching demand and supply for different job profiles (Fernandez-Stark et al., 2012). This includes publishing up-to-date information regarding

the jobs required by industry sectors, the qualifications needed and salary information. Collecting these data and effectively disseminating them among decision makers can enable both prospective students and the existing workforce to make better decisions about their careers and ultimately improve labour market efficiency.

Successful school-to-work transitions also require promoting gender-sensitive vocational training programmes tailored to local contexts (OECD 2012f). For instance, the Adolescent Girls Initiative (AGI) promoted by the World Bank is currently implemented in seven countries: Afghanistan, Jordan, Laos, Liberia, Nepal, Rwanda and South Sudan. The AGI seeks to change gender stereotypes by engaging young women in non-traditional jobs such as electrician, mason and mobile phone technician (OECD 2012f).

The prospect of major employment creation, potential spillover effects and heightened competition from other countries has encouraged policy makers to finance education and training in several global industries. The effect provided by public spending on both the individual in terms of career opportunities and the private sector in improved productivity has been important in encouraging workers and companies to invest in their own skills development. This financing has helped create more productive workers, generating more value added to domestic industries and also attracting FDI that contributes to on-going economic development. State-funded scholarships and tax incentives for training have emerged as two major tools. These scholarships have been used for specific short-term training, such as widespread English-language programmes, and funding for young professionals to seek further education abroad, in both tertiary education programmes and internship opportunities in key industries.

Public authorities should be proactive in workforce development. This is the case, for instance, of the Philippines, which sought to reduce both underemployment and unemployment and exploit opportunities to increase incomes through the upgrading of the offshore services industry (Fernandez-Stark et al., 2012). In 2008, through the President Gloria Macapagal-Arroyo (PGMA) Training for Work Scholarship Programme, the government awarded around 40 000 scholarships. Those invited to apply included recent high school graduates, employees looking for a career change and underemployed or unemployed people, on a need-blind (regardless of ability to pay) basis. Over 30 000 people have graduated from these training programmes and 67% of them are now employed in the offshore services industry (BPAP, 2009). In 2009 the programme was extended to facilitate the employment of "near hires".[10] According to the Business Processing Association of the Philippines (BPAP), 75% of these "near hires" subsequently found work in the industry. In addition, public authorities provide financial support for the private sector's national competency test initiative, which supplies a database of potential recruits for the industry.

Encouraging the long-term adaptability of skills

A good basic education is a necessary condition for workers to adapt to change, but it is not a sufficient one. Investing in "soft" skills is also required. Poor communication skills and inability to work in teams can significantly impede the productivity of employees and their ability to upgrade their skills. Employers in global value chains place a premium on hiring workers with strong, non-technical skills such as leadership, teamwork, conflict management and effective communications. These workers are better prepared to learn new tasks, absorb and process new information and respond to the increasing demands of the chains. Fernandez-Stark et al. (2012), show that there is a

growing demand in many developing countries for improvements in workers' interpersonal skills and their ability to adapt to the changing conditions of the global economy. Firms have begun to prioritise these skills over technical education and hire from a broad range of university disciplines. In addition, lifelong learning helps workers adapt to the new demand for skills that comes with rapid technological change and shifting employment patterns. Private companies, therefore, need to invest in worker training to remain competitive. Public authorities can create, sometimes in partnership with the private sector, training centres in line with changing skills and technology needs. They can also encourage adult education through fiscal incentives or matching grants.

New skills are required as new labour trends are emerging with environment changes. A healthy natural environment is fundamental to economic growth and human well-being (OECD, 2012g). Adequate skills development strategies should be therefore addressed in line with the changing environment (see Box 5.6).

Box 5.6. **Green skills for green growth**

The world's economic environment is moving its paradigm towards green and sustainable growth. Transforming into a low-carbon economy and more green investments in overall sectors are expected to create new jobs and lead to structural changes in the economy. The transition comes with emphasis on renewable energy and eco-construction. Shifts towards decarbonising entire manufacturing industries including transportation, power, building and construction will bring strong demand for new skills (BIS, 2010). For instance, the automotive sector will require advanced skills to produce more eco-friendly vehicles such as hybrid, electric and hydrogen. Different patterns in labour market will appear as economic activities are moving towards those that are more energy efficient and less polluting (ILO, 2011b).

To cope with the transition, overarching strategies on new green skills are needed. The strategies on green skills should embrace two dimensions: ensuring the existence of the adequate skills for the new green jobs, and upgrading and "adding to" existing skills. With the emergence of new occupations, preparing young people to enter the new labour market is important. Relevant training courses and education programmes should be incorporated into the emerging new jobs since they often require a higher level of qualifications. However, researchers point out that few of the critical skills for the transition are new. In most cases, the main focus will be given to greening existing skills to adopt new green technologies.

The new jobs created by the growth of the green economy will require already existing skills to be complemented by green skills (Martinez-Fernandez et al., 2010). For instance, construction companies will need workers with traditional construction skills and up-to-date knowledge of eco-construction. This kind of change in existing occupations will happen more often at the low and medium skill levels. Most of these complementary green skills can be offered by on-the-job training programmes. Workers should be encouraged to enrol in training to upgrade their capacities. Up-skilling and retraining are also necessary for managers to respond to the changes as well as to develop more green-oriented managerial capacities.

Box 5.6. **Green skills for green growth** *(cont.)*

Successful green skills development requires coherent responses from many levels including companies, industries, education systems and government. The close involvement of all stakeholders and co-operation between them is crucial. For instance, trade unions and employers' associations can be involved in education and training through public and private partnerships to respond effectively to the new skills demand (ILO, 2011b). Promoting environmental awareness as a part of education and training at all levels is important and, accordingly, preparation of teachers and trainers with up-to-date knowledge on environmental issues is needed.

Promoting international skills mobility

International migration can play a significant role in the process of skills upgrading, in countries both of destination and origin. Fast-growing economies in the South have turned themselves into major poles of attraction for foreign workers, and a growing number of these economies receive today more immigrants than they send out (OECD, 2011b). This is the case, for instance, in Africa with Ghana and South Africa, in Asia with Malaysia and Thailand, and in Latin America with Argentina and Costa Rica. But this list is not exhaustive and should in any case expand, as both the current economic crisis and the administrative barriers to immigration persist in most OECD countries. South-South migration flows help enrich the stock of skilled workers in countries facing significant skills shortages. Taking advantage of international expertise by hiring foreign skilled workers can help supply the required professionals in the short term, but also gives educational institutions time to develop curricula that meet the escalating demand for highly qualified and experienced labour (Fernandez-Stark et al., 2012). This has been the case, for instance, in several recent oil exporters, such as Equatorial Guinea or Ghana in Africa and Colombia in Latin America, which have benefited from the expertise of engineers from countries with a long trajectory in the production of oil, such as Nigeria and Venezuela.

Developing and emerging economies can also design policies aimed at fostering "brain circulation". Instead of fighting the brain drain, which is virtually impossible, countries of origin should try to promote the return of high-skilled migrants, either temporarily or permanently, as well as the participation of scientific diasporas in transnational networks or research projects (Johnson and Regets, 1998). Some countries have managed to attract back a number of skilled workers by adopting targeted measures. For instance, developing countries can design financial help programmes oriented toward the return of students. One option is to give loans instead of grants to those willing to study abroad. If students decide to stay abroad after finishing their studies, they have to pay back their loans, and the country of origin does not lose its financial investment. By contrast, when students come back the ex ante loan can be converted in an *ex post* grant, thus encouraging returns (OECD, 2007). Countries of origin can also make reforms better to recognise foreign degrees and, in some cases, offer specific employment conditions, including a wage premium, to highly skilled returnees, especially when the skills acquired abroad are scarce in the domestic labour market. One example is China's flagship programme, "1 000 Talents", which offers high-level academic positions to senior Chinese scholars with foreign PhDs with up to 20 times higher pay than the local average (Lum, 2012).

Public authorities in the countries of origin can also mobilise diasporas, in particular through scientific networks (Kuznetsov and Sabel, 2006). Permanent return is still difficult to achieve as many skilled migrants are reluctant to return because of the lack of financial means in universities and research centres, the poor quality of social services (e.g. health, education) or the economic and political situation of the country of origin. It may then be easier to promote brain circulation by encouraging skilled workers to return for short-term visits and take part in research or training activities, which generate positive externalities through knowledge transfers (OECD, 2011b). Highly skilled expatriates can be encouraged to participate in research projects of interest for the development of their home countries. For instance, a country such as Jordan, which suffers from severe water problems, has developed co-operation programmes with foreign universities, in particular in the United States, so that its students can specialise in hydraulic engineering. Even though these engineers may finally decide not to return to Jordan, their targeted research projects may help improve conditions at home. In this respect, the rapid advances in telecommunications have enabled the expansion of transnational networks, strengthening the links with members of the scientific community abroad (Meyer, 2010). Diasporas can also contribute to transferring technology and knowledge by using not only their human, but also their financial resources (OECD, 2012h). This is in part how the software industry developed in India, thereby creating the basis for the country's high-tech development (Devane, 2006). The mobilisation of diasporas, however, requires the implementation of a good system of information on the location, expertise and aspirations of skilled migrants (OECD-MAE, 2012).

Countries of destination can also help promote brain circulation, through specific co-operation programmes. One way is to establish, for instance, grant programmes for students from developing countries conditional on their return, as is the case with the US Fulbright programme, or oriented toward skills that are scarce in developing countries, for instance agronomy and hydraulic engineering. Such measures are a way to reduce the brain drain and to contribute to the development of the countries of origin. Likewise, initiatives such as the TOKTEN programme (Transfer of Knowledge through Expatriate Nationals), enable qualified migrants to return for several weeks or months to their countries of origin and use their skills for the benefit of the community. Despite its modest results in terms of the number of people mobilised (OECD-MAE, 2012), the programme has proved successful in attracting qualified returnees and could be extended in the framework of international co-operation programmes.[11]

Finally, a better allocation of skills at the regional level could be fostered by promoting student and labour mobility (OECD, 2011b). The lack of financial resources in the universities of many developing countries could be partially offset by creating specialised academic clusters and by providing loans or grants to students to study in other countries of the region. In addition, barriers to labour mobility between neighbouring developing countries could be reduced so that the skilled labour force can circulate more easily and satisfy the labour market needs in partner countries. Finally, scientific co-operation could be stimulated by developing regional scientific networks and projects that incorporate highly skilled migrants.

Strengthening co-ordination in the skills market

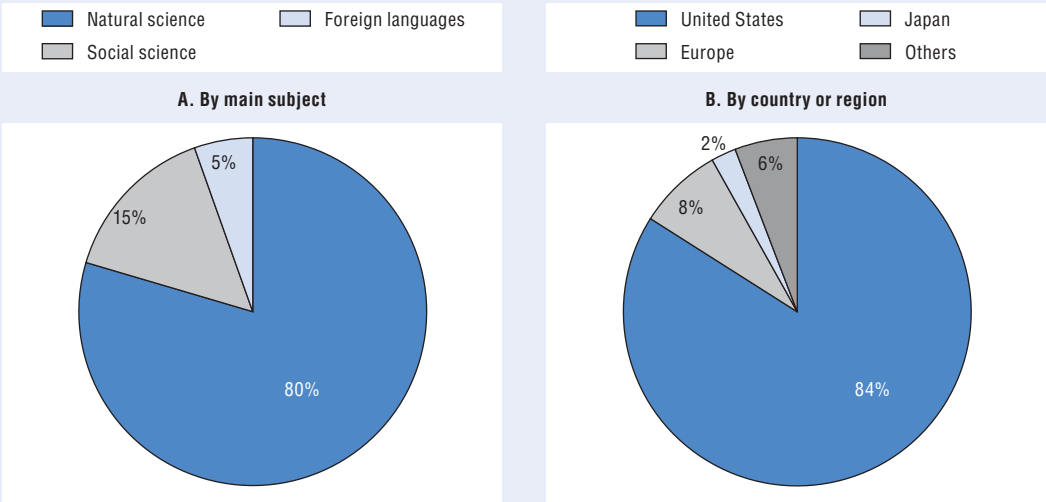
Most successful international experiences rely on the co-ordination of action between the main stakeholders in the skills market. While skills mismatches in developing countries are the product of a series of very diverse factors, a careful review of them shows that most are characterised by a lack of co-ordination between the main actors in

Box 5.7. **Korea's strategies on skills by mobilising its talent**

The evolution of industrial structure has raised the demand for highly skilled workers and increased the need for introduction of the latest technology. As a strategy to meet that demand and need, the Korean government started sending talent overseas after the Korean war. With the importance of science and technology acknowledged during the war, the government encouraged students to go abroad and acquire more advanced skills. In 1954 and 1955 more than 2 000 people left to study overseas. Around 10% received grants from the government and most of them studied science and engineering. Given the difficult post-war conditions, the government provided these grants through fundraising and aid from international organisations. Some of these students returned to Korea in the 1960s and provided a basis for the national development of science and technology.

To further introduce and adopt advanced foreign science and technology, the Korean government launched the study-abroad scholarship programme in 1977. Its main objective was to nurture a group of talented researchers and highly skilled workers. The government granted 1 600 scholarships from 1977 to 1998. Most students (84%) headed to the US, while 80% of grants were distributed to natural science students (STEPI, 2002).

Figure 5.13. **The distribution of scholarships, 1977-98**



Source: STEPI (2002), *Review of S&T Human Resource Policies in Korea*, Science and Technology Policy Institute, Seoul (in Korean).

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As another strategy to develop its national skills in advanced science and technology, the government launched the Five-Year Plan for Science and Technology coupled with the Five-Year Economic Development plan in the 1960s. During that period, the government established the Korea Institute of Science and Technology (KIST) and the Korea Advanced Institute of Science (KAIS). KIST and KAIS focused on the applied research needed to develop industries and quickly established themselves as national centres of excellence. From 1975 to 1981, they produced a total of 1 070 graduates (Masters and PhDs), who represented over 30% of the total number of graduates nationwide (STEPI, 2010).

Since 1968 these institutions have also played a role in attracting back overseas Korean brains with a government-funded project to encourage their return. The project provided returnees with new research and development facilities, competitive pay and a high degree of autonomy with research projects. Those with doctorates who had more than two years' experience in a relevant area abroad were the main targets. This project promoted both permanent and temporary returns by providing employment or opportunities for teaching and consulting in universities or research centres. It was absorbed into a newly launched brain pool programme in 1994, which has broadened its scope to attract not only overseas Koreans but also highly skilled foreign researchers.

Box 5.7. **Korea's strategies on skills by mobilising its talent** *(cont.)*

Koreans have also created networks to expand information exchange and help scientific diasporas contribute to the development of the country's science and technology. The Global Network of Korean Scientists and Engineers (KOSEN) is a good example. KOSEN is a website managed by the Korean Institute of Science and Technology Information (KISTI) and funded by the country's Ministry of Science and Technology (MOST). The number of information exchanges is over 140 000 a year, with a daily average of 400. This network provides an opportunity for researchers to develop and co-operate on transnational projects. It also connects SMEs and researchers both nationally and internationally. Since its foundation in 1999 about 100 000 people have joined the network and among its overseas members about three-quarters hold master's degrees or doctorates. (KOSEN, 2012).

the skills market, namely the public authorities in charge of education and labour; educational institutions; and students, employers, workers and job-seekers. The existence of co-ordination failures partly explains why developing countries fail to foster adequate skills.

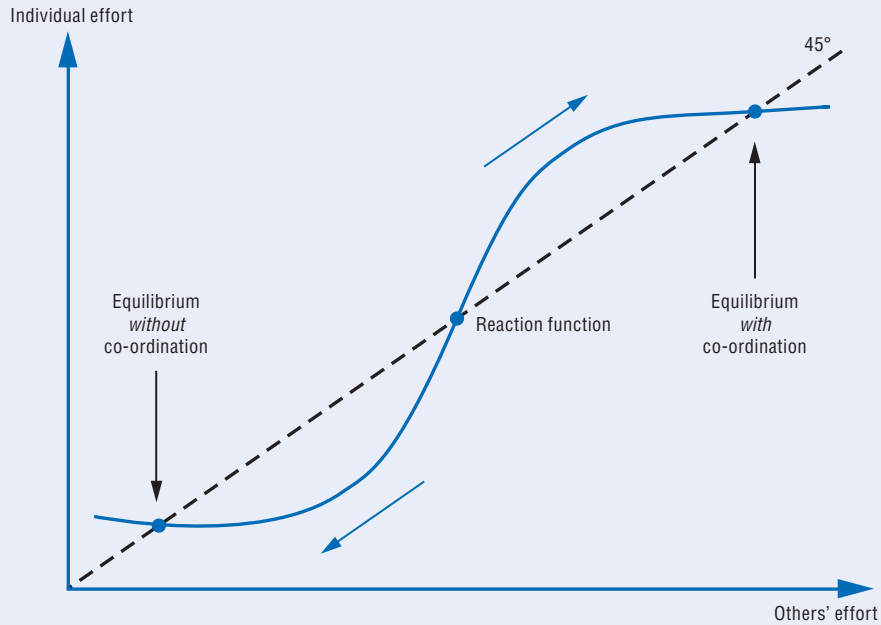
The mismatch between the supply of skills and the demand for them is a good illustration of how co-ordination failures can lead to a sub-optimal equilibrium (Box 5.8). For instance, co-ordination failures between employers and educational institutions can partly explain why young people have problems finding jobs that correspond to their skills, while employers have difficulties finding an adequately educated workforce. The lack or weakness of formal communication channels make it difficult to build the skills required for employment in global value chains. In particular, efforts to incorporate feedback from the industry into curricula have been largely unsuccessful, making it difficult for graduates to develop the skills required in the labour market (Fernandez-Stark et al., 2012). On the one hand, educational institutions, under the supervision of the public authorities in charge of education policy, find it easier to design their programmes according to an idealised academic model, which includes a series of disciplines without concrete application in the labour market. Another issue is that in many developing countries, the education system is more intended to select and reproduce the intellectual elite than really to teach useful skills to most students (Banerjee and Duflo, 2011). On the other hand, many companies, in particular SMEs, consider that it is not their role to intervene in the education system, at least at the initial level (Gereffi et al., 2011).

Another example of co-ordination failure arises in respect of employers. Companies acknowledge the importance of investment in skills and the benefits arising from them. However, it is not always easy, especially for SMEs, to invest in specific skills as they cannot face the costs and take advantage of the economies of scale associated with human capital. In addition, investing in skills comes with a negative externality: the risk that workers who have benefited from specific training move on to other firms. As a result most firms are tempted to take a free ride and restrict their investment to on-the-job training and lifelong learning. That leads to a low-effort equilibrium affecting not only the companies that do not invest in skills, but also the whole economy, which is unable to move from low to highest value-added activities. If, on the contrary, employers could find a way to fund collectively training centres, for instance, they could benefit from a higher stock of specific skills more in line with their needs. In

Box 5.8. **A simple framework of co-ordination failures in the skills market**

Co-ordination failures arise when a simultaneous change in the actions of all economic agents would be collectively efficient, but no agent has an individual interest in undertaking that change (Artus, 1993). The economy can then be trapped in a suboptimal equilibrium, with not enough incentive to make the necessary efforts to exit from the trap. This situation is illustrated by Figure 5.14.

Figure 5.14. **Complementarities in effort choices**



Source: Authors' elaboration based on Artus, P. (1993), "Défauts de Coordination des Activités: Principes et Exemples", *Revue économique*, Vol. 44, No. 3, pp. 551-568 and Rocheteau, G. and M. Tasci (2007), "Coordination Failures in the Labor Market", *Economic Commentary*, Federal Reserve Bank of Cleveland, November.

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The X-axis represents the level of effort made by all agents but one and the Y-axis the effort of the remaining agent. The 45-degree line illustrates the situation where the efforts of all agents are the same. The reaction function corresponds to the level of one agent's effort for any level of other agents' effort. Considering that each individual chooses their level of effort based on the effort of other individuals, possible equilibria can be found at the intersection of the 45-degree line and the individual reaction function. If other agents make little effort, the remaining individual has little incentive to make more effort. By contrast, if other agents decide to supply a high level of effort, the incentive to make more individual effort will increase.

As a result of the complementarities between agents' decisions, multiple equilibria are plausible (Artus, 1993). Each one of them depends on the level of co-ordination between agents (Rocheteau and Tasci, 2007). The equilibrium with co-ordination corresponds to a situation where all individuals choose to provide a high level of effort. The high-effort equilibrium also implies that all agents benefit from the situation. On the other hand, the equilibrium without co-ordination is the product of a vicious circle induced by the aggregation of low individual efforts. Even though all individuals would take advantage of supplying more effort, the lack of co-ordination prevents the economy from shifting from low to high-effort equilibrium.

some cases, this co-ordination is possible without the intervention of the state. But often co-ordination failures need to be resolved through the intervention of public authorities, which can, for example, compel all companies to invest a certain percentage of their annual sales in training. The solution to these co-ordination failures lies in mechanisms that encourage all stakeholders to take an active part in the design of skills-related orientations to reduce skills mismatches in the labour market.

Partnerships between the private sector, industry associations, educational institutions and government constitute an efficient and effective method of workforce development. For example, the Chilean Committee of Ministries for Innovation established public-private councils for strategic economic sectors in 2007. These councils included representation from industry associations, leading firms, educational institutions and several ministries. This coalition was directed by CORFO, the country's economic development agency, and financed by the Chilean Innovation and Competitiveness Fund, which provided USD 23 million for 2008-09. Core issues discussed within this cluster were workforce development, international promotion, regulatory frameworks and local industry development (Gereffi et al., 2011). Costa Rica provides another example of horizontal co-ordination across several levels of government. In 2011 it established an inter-ministerial working group on skills to identify mechanisms and lines of action to work out supply and demand projections and align skills development and training with the changing needs of the labour market. The working group is supervised by the Presidential Council for Innovation and Competitiveness. It is composed of representatives from the ministries of foreign trade, science and technology, and education, as well as the National Institute for Learning, the Technical Secretariat of the Council for Competitiveness, the Private Council for Competitiveness, the National Council of University Deans and the main public universities.

This kind of partnership enables stakeholders to contribute their best resources to creating successful practices for skills development. This is particularly important when upgrading requires high-level technical and analytical skills that are developed over time and presuppose a rigorous technical or university education. However, bringing together multiple stakeholders with many and often divergent interests requires co-ordination, and the state emerges as a natural entity to invite actors to work together. Korea is an interesting case, since public authorities have contributed to fostering the international competitiveness of their firms by co-operating with both private companies and education institutions. Committees bringing together private companies and public officials were created to define orientations and strategic choices, which were supported by consistent reforms of the education system. India is also a good example of successful co-ordination between multiple stakeholders (Box 5.9).

Box 5.9. **Building skills through public-private partnerships: The case of India**

Around 300 million Indians will enter the labour force by 2025 and 25% of the world's workers will be Indians. By 2022, over 700 million Indians of working age will be seeking to earn a livelihood. Of these, only 200 million would be graduates. Against this background, skills development should remain the chief priority. The government has accordingly undertaken four significant initiatives since 2007 in the Skills Development Initiative framework to encourage skills upgrading, based on public-private partnerships (PPP). This involves public Industrial Training Institutes (ITIs), private ITIs, the National Vocational Education Qualification Framework (NVEQF) and the National Skill Development Corporation (NSDC).

The NSDC India is a PPP, with the private sector holding 51% and the Indian government 49%, which has been responsible for establishing the country's network of sector skills councils (SSCs) since 2009. SSCs are national partnership organisations that bring together all the stakeholders – industry, labour and academia – for the common purpose of development of the workforce in particular sectors of industry. The SSCs operate as autonomous bodies and provide funding to build vocational training initiatives.

The mandate of the NSDC is also to enable support systems such as quality control, information and train-the-trainer academies, either directly or through partnerships. For instance, the Federation of Indian Chambers of Commerce and Industry (FICCI) has set up SSCs in five employment-intensive sectors (food processing, chemical and petrochemicals, media entertainment, sports and tourism) in collaboration with the NSDC.

The NSDC was given the mandate of skilling 150 million people by 2022 by catalysing private-sector involvement in sustainable training ventures in 20 high-growth sectors and the unorganised segment, and set up SSCs. So far, around 40 training entities have been approved for funding and 26 have started operations.

Source: NSDC (2012).

Conclusion

One of the main differences between newly high-income countries and most middle-income economies is the quality of their human capital. The rapid expansion of secondary and tertiary education has been a factor of success in countries such as Chinese Taipei, Korea and Singapore. Skilled workers help developing countries move up the value chain and shift into higher technology and knowledge-intensive industries, thus enabling them to escape from the "middle-income trap" (Eichengreen et al., 2013). However, investing in skills, even at the highest levels, is not a sufficient condition for making the transition from middle to high-income status. In fact, skills mismatches can affect even the countries that have massively invested in education, with significant negative effects in terms of labour productivity and economic growth. This is particularly the case with MENA countries, which suffer from both skills shortages and surpluses.

To remain competitive in the global economy, middle-income nations should not only invest in more skills, but also better direct education and training spending. This implies in particular that public authorities in developing countries improve co-ordination mechanisms and discuss the main skills challenges with education institutions, either private or public, the corporate sector and social partners. The international experience,

for instance in countries such as Chile, India and Korea, shows that such co-ordination helps improve the performances of the education and training systems and provides a better answer to labour market needs, not only today, but also in the future.

Notes

1. Most of them belong to the European Union (Cyprus*, Greece, Hungary, Malta, Poland and Portugal) or are resource-rich countries (Equatorial Guinea, Oman and Trinidad and Tobago). The other countries are Macao, China and South Korea. Before them, Chinese Taipei; Hong Kong, China; Japan and Singapore also entered the club of high-income per capita countries (in 2012, 71 economies were classified by the World Bank as high-income, compared to 108 middle-income and only 36 low-income).

   * 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 Islands. 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 Commission:* 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.

2. No African or Latin American country (with the exception of small tax havens or resource-rich countries) belongs to the high-income category. This is particularly striking in the case of Latin America, since the income per capita there was much higher in the 1950s than in any Asian country (in 1950, the income per capita in Bolivia was even higher than in Japan). In Asia, too, many countries seem to be caught in the middle-income trap. Malaysia and the Philippines, for instance, whose GDP per capita was higher than that of Korea until the late 1960s, still remain in the middle-income category. And there are many concerns about the potential of China really to become an advanced economy (Eichengreen et al., 2012, 2013).

3. The explanation for the poor educational performance in oil-exporting countries is not clear. Perhaps because the high skill levels needed by oil-rich countries in their leading sector can be bought or imported, their governments do not face the same urgent educational imperatives and may underrate the need for strong educational policies. Also, they may perceive more urgent needs than the long-term investment in education that results in long-term development benefits (Karl, 2007).

4. ARWU uses six objective indicators to rank world universities, including the number of alumni and staff winning Nobel Prizes and Fields Medals, the number of highly cited researchers selected by Thomson Scientific, the number of articles published in journals *Nature* and *Science*, the number of articles indexed in *Science Citation Index – Expanded and Social Sciences Citation Index*, and per capita performance with respect to the size of an institution. Because the methodology relies heavily on research indicators and the number of faculty members or alumni who have won Nobel Prizes and Fields Medals, it often gets criticised for its weak emphasis on the quality of teaching.

5. Two OECD countries (the Czech Republic and Mexico) have only one university each among the top 500 world universities; six OECD countries (Estonia, Iceland, Luxembourg, the Slovak Republic, Slovenia and Turkey) have none.

6. Target 2.A: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

7. A relatively common practice to overcome the shortage of managerial skills is to hire foreign managers to fill the positions (Gereffi et al., 2011). However, when these managers do not speak the local language, they have difficulties in communicating and in training workers. For example, in Lesotho, the majority of Chinese Taipei factories, which accounted for 52% of clothing firms in the country in 2011, continued to follow the practice of importing all supervisory and management staff from Sri Lanka, Chinese Taipei and mainland China; among management, the common language is Chinese (Morris et al., 2011). This affects the performance of the firm.

8. *Progresa* was the first massive public programme based on "conditional cash transfers". Implemented for the first time in Mexico in 1997, it consisted of giving money to poor families provided that they sent their children to school. The programme was initiated through a rigorous evaluation process relying on randomised control trials. The evaluation showed that enrolment

rates significantly increased for children from beneficiary families, especially girls. The programme was then extended to the whole country. It also paved the way for conditional cash transfers in Latin America and other parts of the world. Banerjee and Duflo (2011) show that even when cash transfers are not conditional, poor families who receive them are more likely to send their children to school.

9. Harvard Business Publishing was founded in 1994 as a not-for-profit institution that is a wholly owned subsidiary of Harvard University. Its mission is to improve the practice of management and its impact in a changing world.

10. "Near hires" are potential employees that are rejected in the recruitment process because of specific shortcomings in their skills. Programme training focuses on developing their weaknesses to usher them into the workforce as quickly as possible (Oliva, 2008).

11. The TOKTEN programme (Transfer of Knowledge through Expatriate Nationals) was launched by the UNDP in Turkey in 1977. Compared to more traditional programmes of co-operation, TOKTEN relies on professionals who are already familiar with the language and culture of the country.

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Chapter 6

Mobilising financial resources

Adequate access to finance is essential for productive upgrading and economic growth. The scarcity of funds in developing countries is often the outcome of a low level of financial intermediation. Small firms, which rely almost exclusively on bank loans for external funding, are more affected by this financing gap, and even more so for long-term financing. To tackle these barriers, development banks have gained importance as instruments for facilitating access to credit and have recently expanded their activities. Credit guarantee schemes have also grown considerably in recent decades. International financial institutions, such as domestic public institutions, have contributed to expanding financial access to firms. Alongside traditional financing mechanisms, new instruments have been tailored to respond to the specificities of small and medium-sized enterprises (SMEs) in non-OECD economies.

Introduction

Access to long-term finance facilitates investment and makes it possible to diversify the production structure or move up the value chain. While factor endowments and technology are important determinants of a country's production structure, financial intermediation has an effect on the level and quality of its investment. At the level of the company, access to long-term finance facilitates investment by easing the constraints that most firms, and more critically SMEs, face at early stages of their creation or when they look to extend their activities. Thus, overcoming financial constraints, in particular those concerning long-term credit, can be critical in supplying the necessary resources (e.g. factors of production, productivity determinants) for upgrading and convergence. Access to short-term credit is also important for working capital purposes, and, besides, more important in a volatile environment. Developing countries have a more volatile economic environment than industrialised ones: as a result, firms that have no access to short-term credit during downturns may not survive shocks.

The strengthening of the financial system in emerging economies has favoured economic growth and development (Beck et al., 2011; Levine et al., 2000). Efficient financial systems provide information on investment opportunities and allow more efficient allocation of capital, with important spillovers for growth. Evidence also shows that an adequate financial development can be critical in enhancing economic growth by reducing constraints on small firms (Beck and Demirgüc-Kunt, 2005). Financial development also generally reduces income inequality and is strongly associated with alleviation of extreme poverty, which is important in a context of development (OECD, 2012a).

Conversely, some regions have historically lagged behind in terms of financial development, notably Africa and Latin America. Associated with low investment and savings levels, this falling behind has helped increase the financing gap for firms. Overall, the scarcity, high cost and volatility of access to finance make it difficult to achieve sustainable economic growth and to catch up. Furthermore, the reluctance of commercial banks to provide long-term funding to the productive sector, particularly non-traditional sectors (e.g. innovation) and SMEs, highlights the need for public policies to overcome imperfections. Evidence suggests that total domestic credit to the private sector is relatively low as a percentage of gross domestic product (GDP) in most non-OECD countries (compared with OECD members), despite their high economic growth rates (see Figure 6.1 and World Bank, 2008) and investment levels. Many firms in non-traditional sectors and SMEs simply do not have any access to credit, and those with access often face difficulties in accessing long-term credit, which is critical in the volatile context of developing countries.

These features have repeatedly raised the issue of public policies aimed at supporting financial access. The complexity of issues related to SMEs and the persistence of market imperfections explain why public action has played an active role in this area (OECD, 2006). In addition to conventional monetary and fiscal policies aimed at increasing funding to the

real sector, other active policies have been implemented. The purpose of this chapter is threefold.

- It identifies the financial gap that characterises firms, and especially SMEs, in non-OECD economies and diagnoses the obstacles to access to credit. In particular, beyond the traditional arguments regarding information asymmetries and lack of collateral on the firms' side, it identifies further barriers coming from the supply side.
- It underlines the renewed role of public development institutions and public policies in tackling these imperfections. To do so, it looks at the role of development banks in providing credit, as well as the recent extension of guarantee schemes for private loans (in particular for SMEs and innovative projects).
- It presents the role of new instruments, in particular for the provision of risk capital for SMEs.

The chapter concludes with some recommendations for public action to improve the schemes through which SMEs are financed in emerging economies.

Characterising the financing gap in developing countries

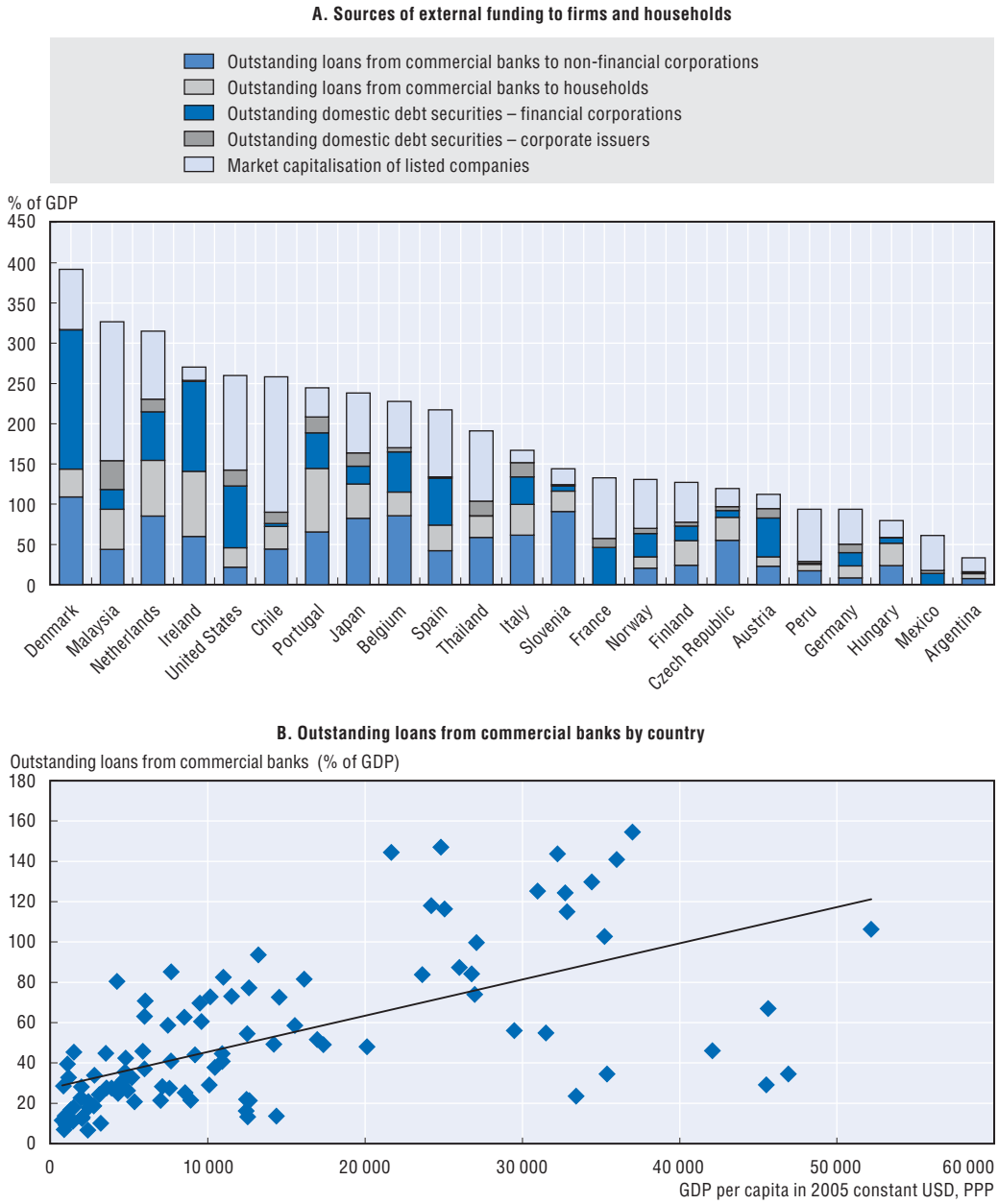
The term "financing gap" (also known as the MacMillan gap) was first introduced in relation to the financing hurdle faced by small firms "not sufficiently large for public issue" (MacMillan Committee, 1931). The gap described the situation where a firm had grown to a size where it had made maximum use of short-term finance and could not access a bank loan or issue debt in capital markets because of high fixed transaction costs and liquidity requirements (Chittenden et al., 1996). Over time, however, the term has come to indicate that a sizeable proportion of economically significant SMEs cannot obtain financing from banks, capital markets or other suppliers of finance (OECD, 2006). This gap, however, should not be confused with the subjective feeling by potential borrowers that funds are too limited or too costly: a policy-relevant diagnosis requires tracing limited access to finance to specific market imperfections that lead to suboptimal outcomes. In what follows, as a first step towards discussing the appropriateness and nature of policy interventions, this gap is characterised empirically and the underlying market imperfections are identified.

There is a difference between OECD and non-OECD economies in the level of financing

There is a large diversity in the structure of financial markets across non-OECD economies, but banking loans lag behind the OECD area (as a percentage of GDP). In general, the level of funding of the economy which comes externally (i.e. leaving apart internal funding such as retained earnings) depends positively on economic development (Figure 6.1A). However, for some developing economies, such as Malaysia, South Africa or Thailand, the level of funding is substantial, thanks to the recent development of capital (stock and bond) markets. In other economies, in particular in Latin America, the level of funding as a percentage of GDP is low, indicating a low level of credit provided by the banking sector and a modest role of capital markets. This overall financing gap is aggravated by the fact that access problems tend to be more severe in respect of funding provided by commercial banks (Figure 6.1B), and in some specific sectors, particularly in SMEs and newly established firms with short credit records and scarce collateral: both candidates for credit that appear too specialised and costly from the perspective of the typical arm's length bank in emerging economies.

Figure 6.1. **The structure of financial markets – private credit vs. GDP per capita, 2010**

Percentage of GDP



Note: For Germany, this excludes the following banks: the Landesbanken, the Sparkassen and the Genossenschaftsbanken, which have significant market shares but are not considered to be commercial banks in the strict sense. As a result, the share of banking loans for Germany appears low.

Source: Authors' calculations based on IMF (2012), *Financial Access Survey* (database), International Monetary Fund, *http://fas.imf.org/* and World Bank (2012a), *World Development Indicators*, (database), *http://data.worldbank.org/indicator*.

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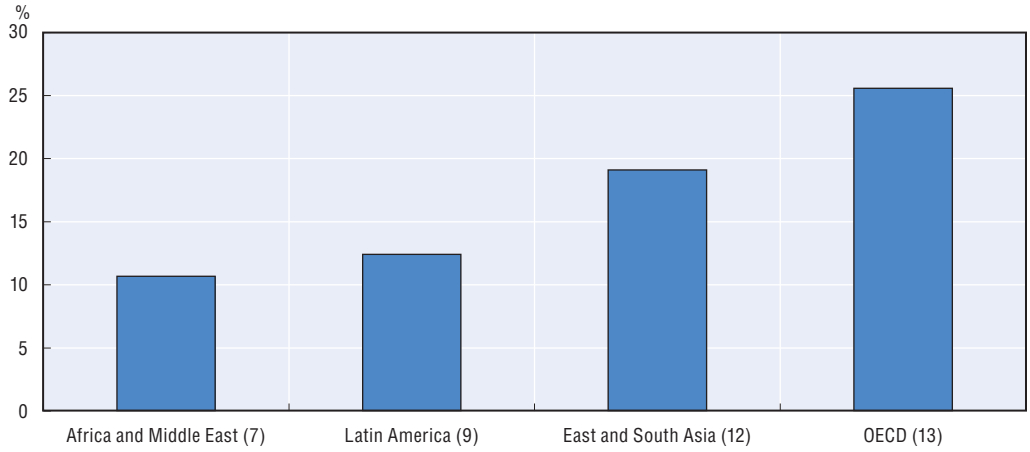
Despite accounting for a large part of the productive sector and more than 85% of employment, SMEs' access to financing is limited

The importance of SMEs in emerging economies contrasts with the scarce financing which they have faced for decades. SMEs have a fundamental role in enhancing overall

productivity and generating jobs. However, access to finance continues to be an obstacle for many of them. A small proportion of total credit (around 11% in Africa and the Middle East, less than 13% in Latin America and less than 20% in Southeast Asia) is devoted to this sector, although SMEs represent more than 85% of employment. Yet in a number of emerging economies the rate of approval of loans to SMEs is relatively high (see for instance Ferraro, 2011; SEBRAE, 2006),[1] suggesting that financing levels that are low and, as shown later, often expensive, are not the result of higher idiosyncratic risk and are more likely explained by barriers and obstacles specific to SMEs.

Figure 6.2. **Credit to SMEs as a percentage of total credit, 2010**



Notes: SME definitions differ for each country; therefore ratios are not always comparable. Variables used for SME classification include number of employees, annual sales and loan size. For more information see Financial Access Report (CGAP).
Africa and Middle East: Botswana, Cape Verde, Liberia, South Africa, Iran, Jordan, Morocco.
Latin America: Argentina, Brazil, Costa Rica, El Salvador, Ecuador, Guatemala, Panama, Peru, Uruguay.
East and South Asia: China; Hong Kong, China; Mongolia; Chinese Taipei; Afghanistan; Bangladesh; India; Indonesia; Malaysia; Pakistan; Singapore; Thailand.
OECD: Australia, Belgium, Estonia, France, Hungary, Italy, Japan, Netherlands, Poland, Portugal, South Korea, Turkey, United States.
Source: CGAP (2010), *Financial Access 2010: The State of Financial Inclusion through the Crisis, Consultative Group to Assist the Poor*, Washington, DC.

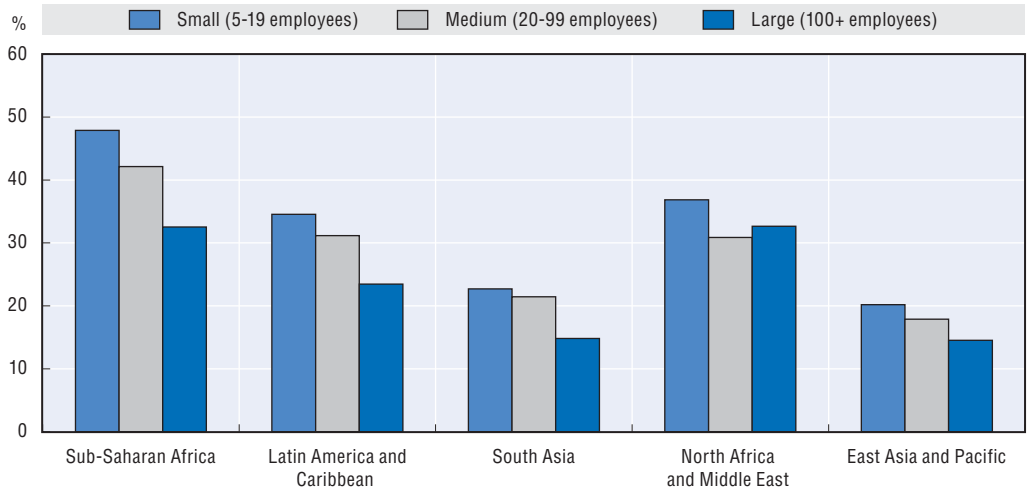
StatLink http://dx.doi.org/10.1787/888932813858

To assess the existence of a financing gap for SMEs, two different types of financially challenged firms should be considered: *i)* those that are excluded from the credit market and do not participate in any type of financing apart from self-financing and informal financial channels; and *ii)* those that do have access to financial markets but are affected by market imperfections that worsen the cost-quality mix of financing. Information on firms that do not have access to any form of formal external finance is predictably scarce. However, a survey-based estimate of the extent of the financing gap by firm size (Figure 6.3) reveals that the proportion of firms that identify financing as a major obstacle is considerably higher for SMEs.

A comparison between OECD and developing economies of the financial access for firms illustrates four elements:

- **Small firms are more affected by the financing gap, in both OECD and non-OECD economies.** Small firms in general have little access to capital markets, because of entry costs and, in the case of non-OECD economies, their lack in depth, higher volatility and

Figure 6.3. **Share of firms that identify financing as a major obstacle**



Source: Authors' calculations, based on World Bank (2012b), *World Bank Enterprise Surveys* (database), *www.enterprisesurveys.org/*.

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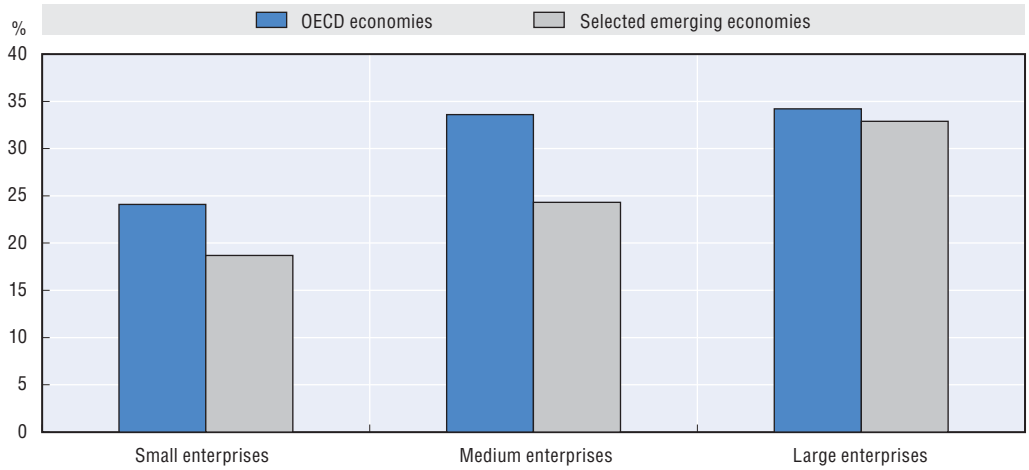
risk aversion. This makes the development of the banking sector even more strategic for them.[2] The credit extended to firms depends to a large extent on their size and their export capacity, resulting in a higher proportion of large and internationally inserted firms being financed (Greenaway et al., 2007; Berman and Héricourt, 2008; Muûls, 2008). To the extent that small firms have limited, if any, access to capital markets, the fact that they also face relatively less access to the banking sector is critical in accounting for the differential financing gap relative to large firms.

- **The gap for SMEs is higher in non-OECD economies than in OECD ones.** As illustrated by OECD (2006), a survey within both regions found that 90% of firms in non-OECD economies acknowledged the existence of a financing gap (compared to 80% in OECD members). Furthermore, 70% of the firms in emerging economies find that the gap is mainly located on the debt side (e.g. banking sector), compared to 30% in OECD economies.[3]
- **The financing gap for SMEs concerns both the long term and the short term, but is more critical for long-term funding in non-OECD economies.** For those firms with access to finance, information on the sources of long-term financing by firm size (Figure 6.4) shows that small firms have a larger gap than large firms: although large firms are equally financed by financial institutions inside and outside the OECD (around 33%), the financing levels for SMEs are considerable lower in emerging economies. Another indicator of the lack of long-term financing for SMEs is the mix of financing sources for fixed assets, a standard application for long-term credit. There is quite a low proportion of bank-granted long-term credit for fixed assets, particularly for smaller firms (Figure 6.5). The same seems to be the case for short-term working capital (Figure 6.6). Despite the heterogeneity among developing economies, SMEs face significant constraints in many countries.
- **Bank financing is not only more limited for small firms but also more expensive.** Financing costs (see OECD, 2012b for Latin American economies) and collateral requirements are critical obstacles for SMEs in accessing financing (World Bank, 2012b).

In most regions the main sources of collateral are fixed assets (e.g. buildings, machinery and equipment), with a higher dependence of small and medium firms on personal assets.

Figure 6.4. **Share of financing for investment through financial institutions**



Note: Small firms include those with fewer than 20 employees, medium-sized firms between 20 and 100 employees, and large firms more than 100 employees. Emerging economies include: Algeria, Bulgaria, Croatia, Egypt, Georgia, Hungary, India, Indonesia, Kazakhstan, Lebanon, Malaysia, Montenegro, Morocco, Pakistan, the Philippines, the Russian Federation, Serbia, Turkey, Ukraine and Viet Nam.
Source: Authors' calculations based on IADB (2010), *The Age of Productivity: Transforming Economies from the Bottom Up*, Inter-American Development Bank, Washington, DC.

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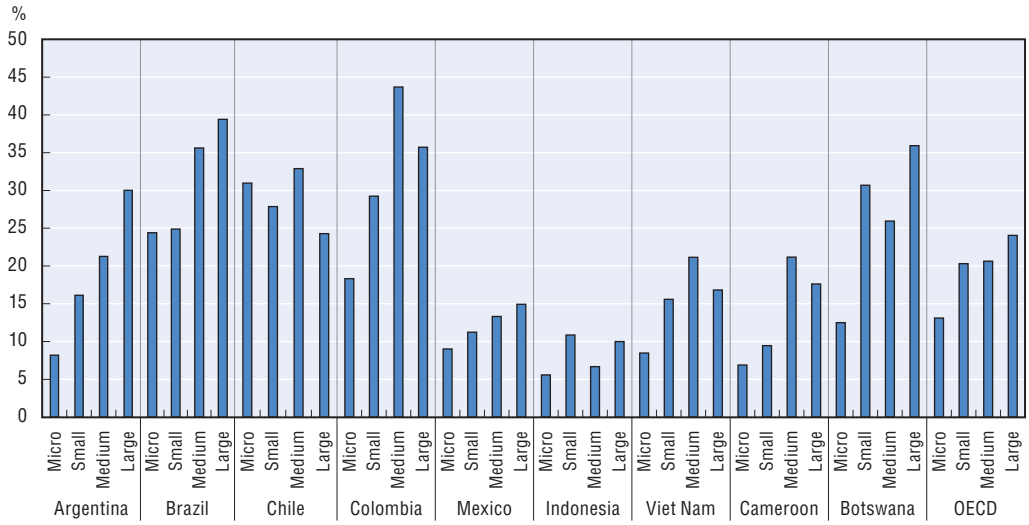
Figure 6.5. **Share of bank loans in the financing of fixed assets, by firm size**



Notes: World Bank Enterprise surveys classify small firms as those between 5 and 19 employees, medium-sized firms between 20 and 100 employees, and large firms more than 100 employees. OECD countries include Australia, Belgium, Estonia, France, Hungary, Italy, Japan, Netherlands, Poland, Portugal, Korea, Turkey and United States.
Source: Authors' calculations, based on World Bank (2012b), *World Bank Enterprise Surveys* (database), *www.enterprisesurveys.org/*.

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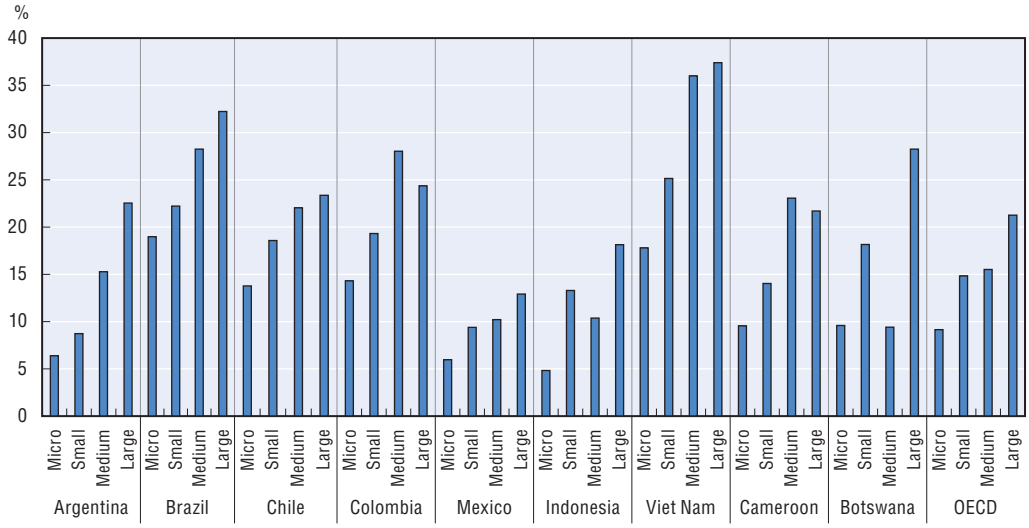
Figure 6.6. **Share of bank loans in the financing of working capital, by firm size**



Note: OECD countries include Australia, Belgium, Estonia, France, Hungary, Italy, Japan, Netherlands, Poland, Portugal, Korea, Turkey and United States.
Source: Authors' calculations, based on World Bank (2012b), *World Bank Enterprise Surveys* (database), *www.enterprisesurveys.org/*.

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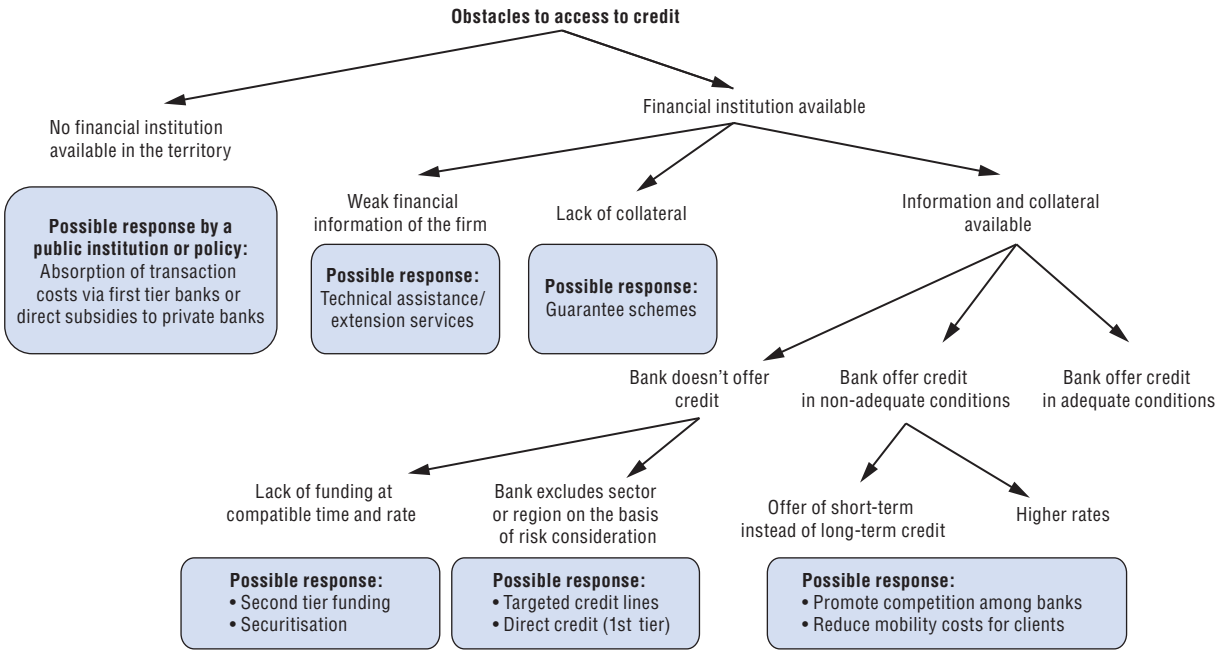
The credit model targeting SMEs in emerging economies shows insufficiencies on both the demand and the supply sides

The first step in identifying the rationale and specific nature of public intervention to tackle the financing gap in developing countries is to characterise the underlying market imperfections at the national level. A general diagnostic map of the potential reasons for limited access to finance is illustrated in Figure 6.7.

On the demand side access to finance tends to be more difficult than it is for large firms because of credit standards, technical and formal loan eligibility requirements, including requests for collateral and guarantees, and higher evaluation and monitoring unit transaction costs. These are the barriers traditionally mentioned in the literature and are the reasons why commercial banks tend to offer less credit to SMEs and why, in turn, SMEs themselves are often reluctant to apply for credit in the first place. Underlying these requirements are information asymmetries in financial transactions. When there is little information on the solvency of the firm, the bank will refuse to lend or will require a very high interest rate. The lack of a track record and the accounting opacity often associated with weak disclosure requirements, as well as insufficient capital to collateralise the loan, are among the most common reasons behind excessive financing costs or even outright credit rationing.[4] Public policy can, and generally does, help reduce these asymmetries through different mechanisms: the introduction of credit bureaux building credit track records to reduce adverse selection problems; technical assistance to help firms achieve the necessary accounting and formalisation prerequisites; and the subsidising or direct provision of credit guarantees to make up for the lack of collateral.

Although information asymmetries apply to businesses in general, they tend to be more acute for SMEs. Most SMEs are unlisted and not required to disclose information. Diversity is also an issue: the wide differences in the productivity of SMEs and in their survival rates (in part a result of their sheer number and natural lack of diversification of

Figure 6.7. **A diagnostic on the obstacles to SMEs' access to credit and the possible public response**



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economic activities) also mean that the information available is often inadequate and consequently credit is rationed by financial institutions. Information asymmetries often lead to lending practices not based on expected return but rather upon access to collateral; hence, the greater collateral requirements that typically handicap SMEs' access to finance. They also increase the cyclical nature of such access: during a recession, the drop in real asset prices (e.g. real estate) often has a negative impact on the availability of credit to SMEs because of the reduced value of collaterals.

On the supply side, since the 1990s emerging economies have undertaken significant reforms to liberalise their financial markets, with a more restricted role for government and higher participation by the private sector. Two main trends have been observed in emerging economies: *i)* bank concentration (for example, the average assets of the three largest banks in Latin America increased from 51% in 2000 to 71% in 2009, for sub-Saharan Africa from 82% to 85%, while in East and South Asia there was a decrease from 69% to 60%); and *ii)* foreign bank participation, which increased more pronouncedly in Latin America with 31% of total assets, compared to 28% in a sample of sub-Saharan African economies, 8% in South Asian economies and 12% in OECD economies (Claessen and van Horen, 2012).[5]

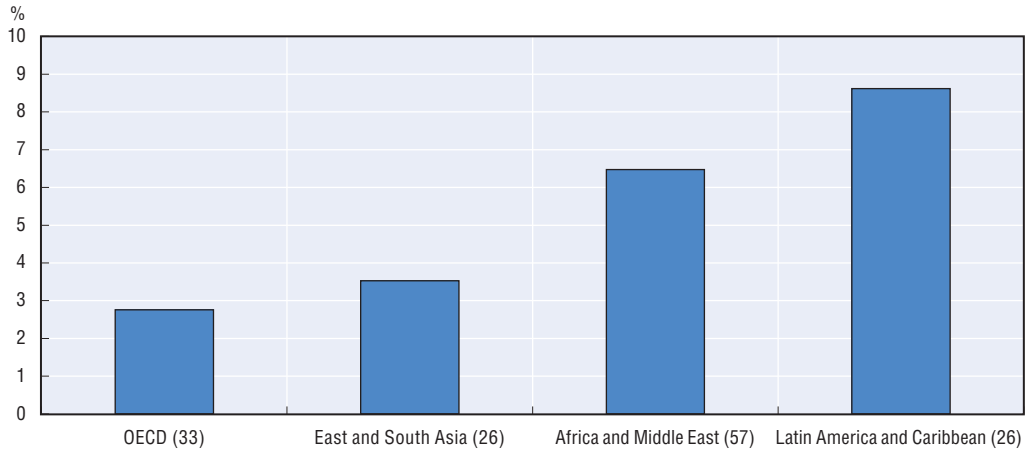
In turn, concentration and foreign participation have had an effect on the efficiency and competition of the financial system (Levy-Yeyati and Micco, 2007).[6] The evidence regarding the link between foreign banks and SME financing is mixed. While foreign banks would have more informational barriers to lending to SMEs which cannot prove they are solvent (Berger et al., 2001; Mian, 2006), and a greater focus on large firms and short maturities (Ferraro, 2011; Beck et al., 2012), some studies find no significant evidence that

loans granted by domestic or foreign banks differ significantly in nature (de la Torre et al., 2010; Beck et al., 2011).

In any event, financial intermediation rates are considerably higher in emerging economies, possibly because of the high fixed costs associated with obsolete technology, lack of competition and relatively small market size. The difference between deposit and lending rates varies widely, but in general OECD rates tend to be lower than those in emerging regions (Figure 6.8), although they have a lower share of non-performing loans compared to some OECD economies, possibly as a reflection of the large overhead costs associated with relatively smaller bank sizes and still weaker competition than in advanced markets (Figure 6.9). Taking into account the fact that loans to SMEs typically command higher interest rates than those to large firms, higher intermediation rates can affect the availability of credit for SMEs, including through rationing.

Perhaps a critical supply-side aspect has been the shift in the business model from specialised relationship banking to a multiservice banking scheme. While the role of credit scoring has helped improve bank efficiency, the evolution in the way the retail banking sector has approached SMEs, from a relationship banking scheme to multiservice banking, explains part of the financing gap for SMEs today. Relationship lending based on mutual trust between banks and firms made financial institutions more active in the SME sector, and there is evidence that (mainly small) banks tended to engage in some form of relationship lending (Cull et al., 2006).[7] Financial innovation and recent trends in

Figure 6.8. **Net interest margins in the banking sector, 2009**



Note: Countries included in World Bank Enterprise surveys:
East and South Asia and Pacific: Cambodia, China, Indonesia, Kiribati, Korea, Laos, Malaysia, Mongolia, Myanmar, Palau, Papua New Guinea, Philippines, Samoa, Thailand, Timor-Leste, Tonga, Vanuatu, Viet Nam; Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka.
Africa and Middle East: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe; Algeria, Djibouti, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Syrian Arab Republic, Tunisia, Yemen.
Latin America and Caribbean: Antigua and Barbuda, Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela.
Source: Beck, T. and A. Demirgüç-Kunt (2009), "Financial Institutions and Markets across Countries and over Time: Data and Analysis", World Bank Policy Research, World Bank, Washington DC.

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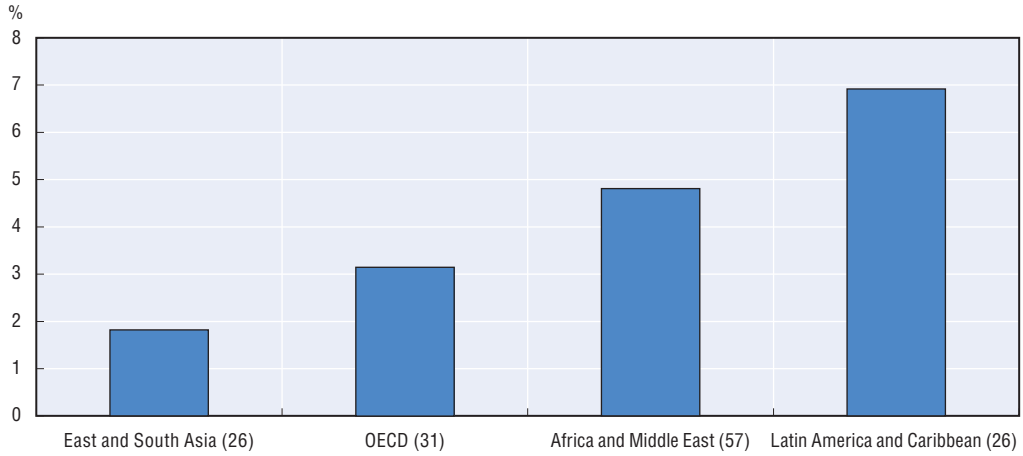
Figure 6.9. **Overhead costs in the banking sector as a share of total assets, 2009**



Note: for countries included, see note for Figure 6.8.
Source: Beck, T. and A. Demirgüç-Kunt (2009), "Financial Institutions and Markets across Countries and over Time: Data and Analysis", World Bank Policy Research, World Bank, Washington DC.

StatLink http://dx.doi.org/10.1787/888932813991

prudential regulation favoured an approach to risk evaluation based on the assessment of the firm's track record and solvency through a standardised screening process as opposed to growth and profit potential. This evolution biased the selection to the detriment of SMEs and young companies with no record.

The predominance of multiservice banking tended to exclude a large segment of small firms. Multiservice banking, which was often accompanied, if not fostered, by a higher participation by foreign universal banks, placed the focus on standardised products with less costly screening mechanisms (and a lower premium on SME loans). Credit risk assessment and credit scoring models were in most cases detrimental to SMEs, as they were based solely on risk. There is also evidence that, with the new multiservice banking, banks gradually shied away from maturity transformation into liquidity intermediation, becoming more dependent on fees. Moreover, some of the detrimental effects of relationship lending, such as the lower mobility of firms across banks and higher switching costs, have not disappeared in multiservice banking. Capture effects and mobility costs are not new in the banking sector, nor are they restricted to SMEs. Repeated lending from only one bank has also brought rent extraction in OECD economies (Sharpe, 1990; Rajan, 1992; Uchida et al., 2008). However, the number of bank relationships increases with firm size (Ongena and Smith, 2000; Mercieca et al., 2009), and often SMEs have to accept any terms offered by the relationship lender. Often SMEs that apply unsuccessfully for long-term financing cannot reapply to a different financial institution. At the same time, large banks with standardised technologies are likely to charge higher premiums (Uchida et al., 2008).

Although it is still too early to say, the final impact of the new Basel III rules on SME access seems to depend on two countervailing effects: on the one hand, they increase the liquidity requirements for the banking sector, thereby reducing available capital and possibly increasing the probability of higher financing cost for SMEs or commercial credit rationing (OECD, 2012c; Elliot, 2010); on the other, by reclassifying loans for the SME sector as retail banking, and therefore reducing the risk weight applied to them, they can lessen the associated capital requirements (SME loans were previously risk-weighted as corporate loans). The net effect, once the regulation is implemented, is uncertain.

Development financial institutions can mitigate the financing gap

The debate about public financial institutions and public intervention in the financial sector has centred around banks, either in the form of state-owned banks or through agencies that provide collateral and technical assistance to facilitate access to bank loans. The focus on banks, as opposed to equity or bond financing, arises because in principle SMEs and young firms have little if any access to capital (bond and equity) markets. This is mainly for two reasons: *i)* non-linear transactions costs, due both to fixed costs of issuance that burden them proportionally more heavily and to fixed informational costs that discourage the efforts of professional analysts (which, in turn, are an essential input to the placement of marketable securities); and *ii)* idiosyncratic characteristics such as limited collateral and track records that make credit screening and monitoring more intensive in terms of information – a task which banks (particularly, "relationship" ones) are better equipped to address because of their economies of scale.

As a result, the development of capital markets that accompanied, and to some extent compensated for, the retrenchment of the banking industry to arm's length and shorter-term consumer lending have left SMEs relatively underfinanced. More specifically, SMEs face the combination of two stylised patterns of the banking industry. On the one hand, because of financial innovation and stricter prudential regulation, commercial bank assets have been gradually concentrating into shorter-term personal lending and mortgages (both easier to screen and liquid, as their homogeneity facilitates securitisation and reselling to the market). On the other, equity and bond markets represent only a very minor share of the funding of SMEs. Indeed, a quick look at the distribution of bond issuance by firm size confirms the point.[8] In sum, if historically SMEs have faced relatively higher hurdles to tapping external sources of finance, the continuing change in the business model of the banking industry leaves the sector without a clear substitute.

Development banks have strengthened their role to tackle global financial challenges

The evidence on the impact of public banks on development is mixed. Levy-Yeyati et al. (2004) studied the state-owned or public banks and found no relationship to economic growth. Still, the evidence that state-owned banks lead to lower growth and financial development is not as strong as previously thought. Indeed, there are considerable differences in the performance of development banks. Körner and Schnabel (2010) found a negative impact of a high market share of development banks on growth in countries with a low degree of financial development and low institutional quality. On the other hand, Andrianova et al. (2010) found that higher state ownership in the banking sector is actually associated with faster growth. Other studies suggest the role of public/development banks is to provide loans when the private banks lag behind. For instance, Micco and Panizza (2006) show that lending by state-owned banks is less responsive to macroeconomic shocks than lending by private banks (see also Barbosa, 2010 for Brazil). This was confirmed by the behaviour of banks during the last crisis (de Olloqui and Palma, 2012; de Luna-Martinez and Vicente, 2012).

Development banks have transformed in recent decades

Public financial institutions (PFIs) in the form of development banks date back to the 1930s, when they were set up as a response to the acute financial shortage after the Great Depression. In some regions, such as Latin America, development banks started to play a more prominent role in providing public support for the import-substitution policies instituted in

the 1960s. The role of PFIs was questioned after the 1980s because of their poor financial results, which were attributed to management failures, misallocation of resources through sector-specific quotas, interest rate subsidies and political capture, which created a risk to fiscal stability in fiscally challenged developing economies. Continuous capitalisations to overcome losses favoured subsequent reforms for restructuring and privatising state-owned banks in a large number of emerging economies (Levy Yeyati et al., 2007).

The economic reforms implemented throughout the 1990s led to a more prominent participation by the private sector in the financial system, with significant impacts on the institutional framework of PFIs. A number of development banks were privatised or closed. Others, in particular in Latin America and Asia, have managed to diversify since the 1990s and to adapt to a changed financial environment. By adding the provision of other financial services, including working capital, advisory services, leasing, insurance, entrepreneurial development and provision of technical assistance, they often turned into large, diversified, nationwide banks. They also used new products such as syndication, equity and quasi-equity, and often turned to sophisticated financing tools (guarantees, synthetic securitisation, etc.). At the same time, they focused on better risk management, the reduction of operational costs and specialisation e.g. in export financing or microenterprises (Ferraro, 2011). On the other side, the subsidy of interest rates, which had been one of the traditional mechanisms used by development banks to support SMEs, was gradually abandoned and replaced by other instruments.[9] This is partly explained by the fact that non-subsidised rates better favour the additionality of the credit, i.e. that the credit would not have been provided by private banks.

Overall, government-owned banks in emerging economies decreased their participation in the financial system, from 20% in the first part of the 2000s to nearly 17% in 2010 (World Bank, 2012b). Regional differences remain, with East and Central Asia, Africa and Latin America at similar levels of public ownership (between 10% and 15%) and South Asia and the Middle East and North Africa with higher levels (above 30%). The institutional structure has also evolved. Yet, there is a large proportion of banks combining first and second-tier lending (52%) compared to first-tier only (36%) and second-tier only (12%) institutions.

Box 6.1. **Financing SMEs in OECD countries through public institutions: The role of KfW in public investment programmes in the 1950s in Germany**

In post-war Germany the KfW (Kreditanstalt für Wiederaufbau) was one of the main actors in state-driven programmes that aimed to foster financial access in the real economy. The KfW established three substantial programmes, among others, in which private banks were provided with public financial resources.

The first programme was focused on asset exposure. Pursuant to this, the KfW provided lending to other private-sector actors with favourable conditions set by the KfW itself. The most prominent initiatives were short and long-term lending through pass-through credits (*Durchleitungskredite*), as well as transitory credits (*Durchlaufende Kredite*). The major difference between these types of credits was in the distribution of risk. In the case of pass-through credits, the risk was partially taken by the financial institution, whereas in the case of transitory credits the bank acted essentially as a trustee between its customers, the German authorities and institutions, whereby risk was completely assumed by the German state.

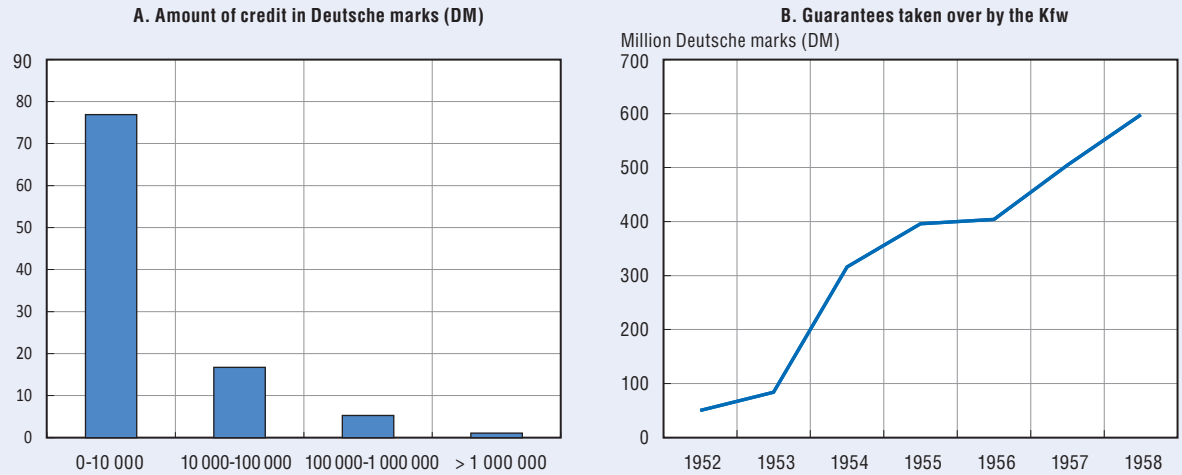
The amount of transitory credits increased 15-fold between 1950 and 1960. The pass-through credits experienced a similar trend. Between 1950 and 1951 alone the number of provided credits increased by 25% from 2 363 to 2 983 loans. The lion's share of these loans went to the export industry sector. The sharp upward trend in these types of loans between 1950 and 1960 emphasises their importance for the real economy.

Box 6.1. **Financing SMEs in OECD countries through public institutions: The role of KfW in public investment programmes in the 1950s in Germany** *(cont.)*

A prominent example regarding the support of KfW to financial institutions is the Deutsche Bank. In 1952, KfW provided the Deutsche Bank with around DM 28 billion (Deutsche marks) (USD 6.6 billion), which was used for long-term lending for industrial investment. In the same year the Deutsche Bank managed around DM 3 million in transitory credits. Secondly, the KfW processed a programme (*Mittelstandsprogramm*) established in 1952 by the German government to support SMEs through a financing of financial institutions. The goal was to increase the productivity of SMEs. The programme experienced a significant upward trend resulting in a doubling of the total amount provided to SMEs in a single year.

Figure 6.10. **Deutsche Bank long-term credit**

Percentage of total, 1955



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However, several issues related to the application and characteristics of the loans led to a reversal of the positive trend. This was due to the lack of bank-side collaterals, lagging accounting structures for borrowing, as well as reluctance to disclose business relations and the loan-related correspondence. Nevertheless, the funding of the SMEs was not affected because of the enhanced role in lending of the private-sector banks.

The third programme aimed at fostering investments and was related to guarantees taken over by the KfW to national and international creditors. The German state provided through KfW guarantees to the private sector (in particular for funding the industries). In only six years the guarantees increased from DM 50 million to DM 600 million (Figure 6.10).

Source: Annual reports, Kreditanstalt für Wiederaufbau, 1952-58, Annual reports, Deutsche Bank, 1955.

The scope of development banks deals more and more with SME programmes, counter-cyclical packages in downturns and targeted sectors

The scope of activity of development banks is large, and generally addresses different market imperfections. Six target areas where development banks currently play a critical role have been identified: *i)* microenterprises/start-ups; *ii)* SMEs; *iii)* international trade/globalisation; *iv)* housing; *v)* infrastructure; and *vi)* the rural/agricultural sector (see Gutierez et al., 2011).[10] The most common target market for development banks are SMEs (covered by 60% of development banks studied),[11] followed by international trade (45%) which also has major SME participation. Other target markets that development banks

typically address include home mortgage financing for low-income segments of the economy; availability of large sums of long-term financing for infrastructure projects; banking services in remote areas that are too expensive to service; agriculture financing as a result of risks associated with crop yields. Development banks can be specialised institutions covering a single target sector (with the advantage of having specialised staff) or multiple sectors (with the advantage of spreading the risk).

The SME programmes of development banks have gained importance in the last decade. From promotion agencies for SMEs to direct financing, development banks in non-OECD economies have focused on the SME sector through different channels: financing capital goods, working capital and investment, directed at improving productivity or complying with environmental regulations.[12]

In addition, development banks have often channelled credit counter-cyclically in periods of economic distress. During periods of economic downturn and higher credit risk, when private banks tend to have lower incentives to lend, development banks can play a countercyclical role and make monetary policy more effective.[13] The literature has illustrated this pro-cyclical behaviour and the countercyclical role of state-owned banks in the face of a credit crunch (see, for instance, Gutierrez et al., 2011): in the cases where central banks are focused on enhancing their policy credentials, e.g. in Latin America, governments have used development banks to channel funds directly into the productive sector.[14]

Beyond credit alone, development banks have been integrators and implementers to drive new sectors for long-term industrialisation (Scott, 2007, see Box 6.3 on South Africa). Recent examples of the role of development banks include areas such as technology, energy and infrastructure. In the last 50 years, the Banco Nacional de Desenvolvimento Econômico e Social (BNDES) has supported the industrialisation priorities defined by the Brazilian government (Box 6.2). The government has recently given priority to energy programmes, in particular green-friendly technologies from the ethanol industry, where the country has a comparative advantage. Together with Petrobras, BNDES sponsors projects involving ethanol bio-fuels to enhance sugar-based fuel production. The Korea Development Bank (KDB), in association with the Industrial Bank of Korea (IBK), has been involved in development strategies for new sectors (e.g. automobile, electronics). Two combinations of tools have been used: on the one hand, government purchases combined with import restrictions on specific sectors, and on the other loans with soft repayment terms, foreign exchange credit and subsidies.

As in OECD countries, infrastructure programmes have been an important component of the portfolio of development banks.[15] Moreover, the role of development banks in linking stakeholders and resources has been stressed in this domain (Scott, 2007). Examples in OECD countries include the role of the Development Bank of Japan (DBJ), the Japan Bank for International Cooperation (JBIC) or the former Long-Term Credit Bank of Japan (LTCB) for infrastructure delivery through the whole cycle (financing, advising and implementation). In Brazil the BNDES has helped overcome bottlenecks and capacity constraints. Through the Project Structuring Fund (FEP), the bank seeks to identify and support government concessions and Public Private Partnerships (PPPs), which involve a partnership with other multilateral funds (International Finance Corporation [IFC], Development Andean Corporation [CAF]). Currently the focus of activities of the structuring projects of the BNDES includes the airline and port industries (e.g. Infraero) and

Box 6.2. **Development banks as innovation enhancers: The case of BNDES**

BNDES, the Banco Nacional de Desenvolvimento Econômico e Social, Brazil's national development bank and one of largest in the world, has set itself the task of fostering sustainable and competitive development in the Brazilian economy, and of generating employment while reducing social and regional inequalities. The bank is the main instrument for implementing the federal government's investment policy.

Innovation is a strategic priority for the bank. The goal of the BNDES is to contribute to innovation activities in the country and to their systematic implementation. For this the bank seeks to finance investment projects associated with building capabilities and creating proper business environments so that Brazilian companies can achieve a better competitive position. The BNDES works to promote the innovation plans of firms linked with its own strategy and associated with industry's technological and competitive trends. To this end, it seeks out innovative enterprises with high growth prospects and internationalisation perspectives in production chains with growing technological density.

The bank's main weapons to address the challenge of fostering Brazil's innovation are credit and equity financial tools. In the first case the BNDES lends money to the firms directly or via other financial institutions, which provide a high territorial coverage. In the second the bank acts as a subscriber to securities or participates in seed money, venture capital and private equity funds. The BNDES has significantly increased its innovation disbursements in recent years, from BRL 563 million (Brazilian reals) in 2009 to a peak of BRL 1.6 billion in 2011, a threefold increase. The bank's innovation portfolio amounted to BRL 9.8 billion in July 2012.

One of the main achievements of BNDES activity to foster innovation is Criatec, a seed money fund. Criatec aims to capitalise innovative micro and small companies with seed capital and offers them appropriate management support. The BRL 100 million fund (BRL 80 million from BNDES) is invested in 33 companies in a variety of industries, ranging from bio- and nanotech to software and microelectronics. Another example of an innovation support instrument is the BNDES Card. Based on the concept of a credit card, it is aimed at financing investment in micro, small and medium enterprises in a simplified fashion.

The BNDES operates as a complement to other institutions within the Brazilian Innovation System. For instance, the BNDES and the Financiadora de Estudos e Projetos (FINEP) signed in 2011 an agreement to finance innovation in the sugar and ethanol sectors. In 2012 an agreement to support innovation in the oil and gas supply chain was signed between the two institutions. Also, to strengthen the national innovation system, the BNDES supports the co-operation of universities and technological institutes with firms. Funtec, a fund conceived with this objective, acts as a fund providing non-reimbursable resources to projects encouraging technological development and innovation of strategic importance, in accordance with the Federal Government's programmes and public policies.

Source: Interviews with BNDES and annual reports.

a trans-continental railway corridor between Brazil and Chile linking the Atlantic and Pacific Oceans. Municipal concessions include projects on highways, sport facilities for the 2014 football World Cup, sanitation and solid waste.

In spite of their increasing importance, financing programmes managed by development banks have not been without obstacles and limitations. The bureaucratic mechanisms for granting loans often conspire against their effectiveness: approval times

can be long, reducing the interest for both the firm and the financial institution. Also, in the absence of clear evaluation mechanisms, there is always a latent concern about the impact and additionality of credits granted by public institutions. These limitations underline the importance of a proper design in terms of governance and structure to achieve development goals.

The governance of development banks has come under scrutiny, and should be explicit

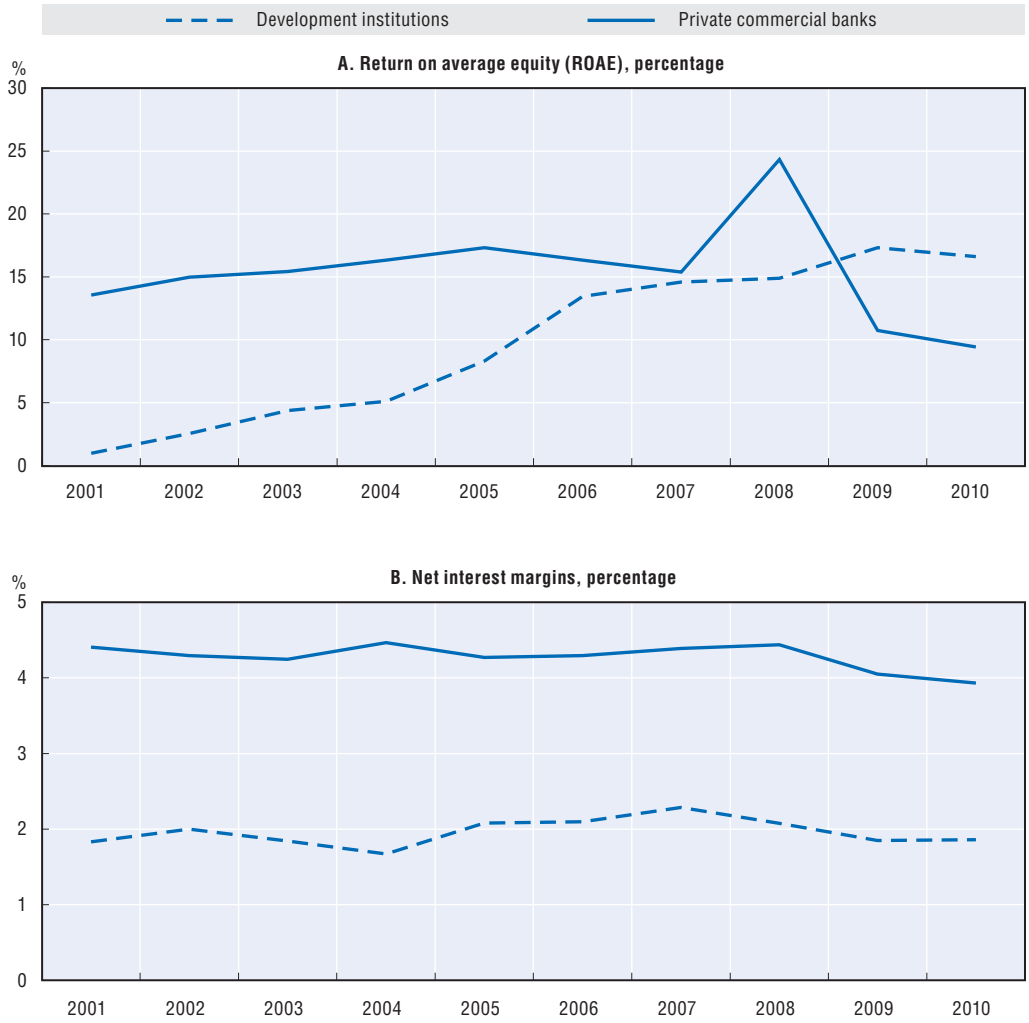
The question of governance for development banks has focused on issues of transparency, accountability and efficiency. Development banks and international financial institutions have in general agreed on the need for transparent operations to legitimise their existence *vis-à-vis* public opinion.[16] However, the governance of development banks can be more challenging than is the case in private financial intermediaries, and unless their institutional framework is strong enough to withstand political pressure, the institution can become vulnerable to political interference (OECD, 2010; de Luna-Martínez and Vicente, 2012). Moreover, looking at better management practices and policies touches on the appointment of boards of directors and managers.[17] On the question of structure, the issue remains unresolved. There are wide differences in emerging economies: while some countries (e.g. Mexico) favour decentralised public agencies with specialised mandates and target sectors, other countries have opted for single, centralised public institutions spanning a variety of sectors and often conflating first-tier and second-tier financing, as well as the provision of guarantees.

In respect of financial health, some lessons can be learnt from the previous experiences of development banks. The funding of public financial institutions is one critical issue for their sustainability. Most development banks are funded by long-term instruments, while their exposure to national accounts or government budgets has decreased (de Luna-Martinez and Vicente, 2012). Development banks in non-OECD economies have significantly improved their financial performance. Better management practices and public scrutiny, as well as a clearer mandate, have allowed them to improve their financial performance, even if they are less profitable than most private financial institutions. For instance, their return on average assets has increased and reached similar levels to those of private commercial banks (see Figure 6.11). At the same time, their net interest margins remain lower, which seems to confirm their specific role in easing access to credit.

However, public development banks have sometimes suffered from an inadequate regulatory approach. Indeed, the application of similar standards to development banks and private commercial banks has sometimes led the former to emulate the latter. While it is essential to define a proper mechanism for evaluating the performance of public financial institutions, this exercise should go beyond the aspects of risk and liquidity for two reasons. The first is well known and has been widely debated: a proper performance indicator should take into account the social benefits associated with financing projects with positive externalities. Here the definition of externalities is crucial and should be precisely stipulated in the mandate. New firms, dynamic SMEs or underfinanced regions or sectors may contribute productivity, labour demand or regional development. By contrast, unviable SMEs may simply consume funds at the expense of other, more efficient uses. The example of the Industrial Development Corporation of South Africa (IDCS) on governance structure is illustrative (Box 6.3).

Perhaps as important for the good functioning of a development bank is the customisation of prudential standards. The rationale for prudential requirements typically

Figure 6.11. **Performance within governmental financial institutions and private banks**



Note: As a result of the varying availability of data, the sample of development institutions and of private commercial banks differs across statistics. It encompasses 269 private commercial banks and 45 development institutions for the ROAE statistics, and 271 private commercial banks and 33 development institutions for the net interest margins statistics. Data are weighted by the banks' assets in 2010.

Source: Authors' calculations based on Bankscope (2012), *Bureau van Dijk – Bankscope Database*, *https://bankscope2.bvdep.com/version-2013314/home.seru?product=scope2006* (accessed December 2012).

StatLink *http://dx.doi.org/10.1787/888932814029*

hinges on the need to limit excessive risk taking by limited-liability, deposit-taking banks and to ensure that private institutions have enough capital and liquidity to cover unexpected losses and liquidity shortages. In the case of a development bank, this risk cannot be ignored but should not be regarded in isolation; it should, rather, be consolidated within the fiscal accounts and treated as any other budgetary line. Thus, limits to maturity mismatches that may increase the regulatory cost of long-term lending may disappear in the new framework; the more so when it is taken into account that the possible public guarantee of development banks in practice works as a deposit guarantee and should in principle reduce the risk of sudden deposit withdrawals, increasing the stability and lengthening the expected maturity of the funding.

Box 6.3. **Implementing industrial policy through public financial institutions: The Industrial Development Corporation of South Africa**

The main challenge for a development bank is to combine additionality, that is, the capacity to add economic value to the economy that in its absence would not be produced, with financial sustainability. This is a delicate balance where many banks have failed. There are well known cases of public banks that, after failing to build solid portfolios, became bankrupt or had to be rescued through capitalisation. On the other hand, and this is equally problematic, many public banks subsist doing what private banks do, being profitable but not necessarily producing other socio-economic benefits.

The state-owned Industrial Development Corporation (IDC) of South Africa has been responsible for providing long-term finance for investment of private enterprises, promoting emerging economic activities and encouraging technological upgrading since 1940. The IDC relies on funds generated primarily by its own equity investments and loans, as well as on borrowings in global and domestic capital markets. Although the IDC has followed a developmental rather than a financial maximisation approach, it has not been capitalised since the mid-1950s and has regularly realised profits. Thanks to its good credit rating, at the sovereign level of Baa1, the IDC is able to borrow at relatively attractive interest rates to fund its loan provision. Its equity funding requirements are catered for by exiting from mature equity investments.

These results are based on the combination of a business model, governance structure and operational procedures that seek to ensure long-term sustainability:

- a business model in which a strong capital reserves position enables the IDC to maintain a good credit rating despite higher appetite for risk in investment activities;
- a governance structure whereby a board of directors with a balanced composition, diverse backgrounds and expertise encourages independent decision making and effective deliberation;
- operational procedures in financing decisions which are underpinned by solid due diligence and risk management practices so as to ensure the financial viability of investments.

The IDC encourages sustainable economic growth in South Africa by facilitating access to finance for private companies in several sectors: manufacturing, agriculture, mining value chains, industrial infrastructure, green industries, tourism and new sub-sectors in the knowledge economy. With this aim, it offers a broad set of financial instruments (credit, equity investment, export and import finance, bridging facilities, guarantees, seed and venture capital, etc.) that fit the projects' specific features. Given that the emphasis is on providing access and not on reducing costs, funding in general is provided at market rates, although at more flexible terms and longer maturities than offered by private financiers. A series of ring-fenced funds providing finance at more concessionary rates target specific categories of beneficiaries (e.g. women entrepreneurs, communities, people with disabilities), sectors (e.g. textiles and apparel) which face serious competitiveness challenges or developmental goals (e.g. job creation, energy efficiency).

Box 6.3. **Implementing industrial policy through public financial institutions: The Industrial Development Corporation of South Africa** *(cont.)*

South Africa has many private banks which provide credit to private companies, but they essentially concentrate on short-term operations. Given that the IDC is focused on the medium to long term and on emerging and more risky sectors, there is no significant "crowding out" effect. Moreover, in periods where private banks have cut credit, the IDC has intervened, providing counter-cyclical funding support to enterprises in distress, preserving industrial capacity and saving thousands of jobs. The IDC monitors its performance, both in financial results and in terms of impact on production, jobs, regional development and economic transformation. To illustrate, during the last five years IDC resources facilitated the creation of nearly 170 000 jobs. In the financial year ending in March 2012, IDC's financing approvals totalled an unprecedented level of ZAR 13.5 billion (South African rand) (USD 1.6 billion), a 55% increase relative to the previous year despite the modest rate of growth of the South African economy.

In line with national economic policy as encapsulated in the New Growth Path and Industrial Policy Action Plan, the development of green industries (renewable energy, energy efficiency, waste management, recycling etc.), mineral value chains and agro-processing, among others, are priority areas for the IDC, forming an integral part of its industrial capacity development mandate. The sizeable infrastructure development programme being rolled out by the public sector at large is not only providing a counter-cyclical stimulus to the economy, but also opening up myriad opportunities for the rejuvenation of South Africa's industrial base and for the promotion of localisation with IDC backing.

Source: Interviews and IDC Annual Reports, 2012.

In any case, an improved financial performance, while welcome from a fiscal viewpoint, is not necessarily a good thing from a development perspective, if it has been achieved by relinquishing the development mandate. A proper design of a development bank should combine a precise definition of its objective, quantitative indicators to measure performance relative to those objectives, and a regulatory framework that internalises those objectives. Ultimately, a state-owned development bank is qualitatively no different from any other budgetary item.

Credit guarantee schemes have grown significantly

Credit guarantee schemes (CGSs), public and private, have grown significantly over the last decades, across both OECD and non-OECD countries (Beck et al., 2010). CGSs are used across economies as tools to ease financial constraints for SMEs and start-ups.[18] As underlined above, these firms are typically limited in their capacity to access credit because of under-collateralisation and market asymmetries due, for instance, to their lack of credit history and lack of the expertise needed to produce the sophisticated financial statements that banks have increasingly demanded. The loan guarantee implies that the CGS reimburses a predefined share of the outstanding loan in case of default. Part of the risk is hence shifted from the bank to the CGS and this can improve the flow of funds from the lender to the borrower. Different models can be observed in the implementation of guarantee schemes in emerging economies: on the one hand, state-supported guarantees endorsed by public institutions and on the other, private collective arrangements such as mutual guarantee schemes (MGS) than can have both public and private participation.

Participation in a CGS can represent a positive signal to the bank about the creditworthiness of the SME and reduce the incidence of information asymmetries (Honohan, 2010), which may make it easier to start a long-term lending relationship between the lender and the borrower. CGSs help leverage public resources, by catalysing private flows. In recent years, they have broadened their operations by guaranteeing short-term loans and countercyclical loans; postponing the repayment of guaranteed loans; assisting mutual guarantee associations; combining guaranteed loans with business advice services; and guaranteeing equity capital (OECD, 2012d). In addition, CGSs often offer complementary services to SMEs, such as assistance in the preparation of accounting statements and information on financial markets.[19] Some CGSs also offer consultancy-type services, intended to help SMEs improve their competitiveness and productivity.

Public guarantee schemes (PGSs) represent the main guarantee instrument in emerging and developing economies; they can have additional effects by encouraging SME financing through short-term counter-cyclical lending (Box 6.4). PGSs, which are publicly funded, represent the main type of guarantee instrument in developing and emerging

Box 6.4. **Public guarantee schemes in developing countries**

In **India**, the Credit Guarantee Fund Scheme for Micro and Small Enterprises (CGMSE) was launched in 2000 to ease the financial constraints faced by micro and small firms. It is run by the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), owned by the Indian government and the Small Business Industries Development Bank of India. The CGTMSE has grown continuously over the past ten years, in terms of the overall credit volume guaranteed and number of participating banks. In 2009, 9.77% of all small credits were backed by CGTMSE guarantees, corresponding to almost 22% of the guaranteed volume. Most guaranteed loans are directed towards micro firms (83.5% in 2010). This high share corresponds to 27% of the volume of loans guaranteed.

In **Indonesia**, the people's business credit programme (Kredit Usaha Rakyat, KUR), was launched in 2007. To supplement collateral for loans, the government and some co-operative state banks provide a guarantee fee. The interest rate is determined by the Ministry of Finance. Five state-owned banks, 13 regional banks and one private bank participate in the programme.

The **Chilean** credit guarantee scheme FOGAPE is government-owned and managed by the state-owned bank BancoEstado. Between 2006 and 2010 the number of guarantees increased from 25 000 to 64 000 (Bozzo, 2011; Benavente, 2006). Another body, FOGAIN, an investment guarantee fund, was created to overcome some weaknesses of FOGAPE, which was solely focused on providing short-term, working capital credit. The objective of FOGAIN was to concentrate on long-term credit and extend its coverage to medium-sized companies.

The main **Brazilian** credit guarantee scheme is the Fundo de Avail às Micro e Pequenas Empresas (FAMPE). It was launched in 1995 and is operated by the Brazilian Support Service for Micro and Small Enterprises (Servico Brasileiro de Apóio às Micro e pequenas Empresas, SEBRAE), a private not-for-profit entity, created by the public authorities in 1972 to support the development of micro and small firms. In 2009, 44 000 loans were guaranteed.

Source: National sources and OECD (2012d, 2012e). For India: Reserve Bank of India (2010), Indian Ministry of Micro, Small and Medium Enterprises.

economies. They have greatly developed in the 2000s, following the turmoil that first-tier development banks have faced in a number of developing economies which has prompted debate on whether public bodies should be directly involved in lending operations, or whether they should rather provide incentives or funding to more marked-based mechanisms. As countries watched more carefully the sustainability of their public finances, the extension of guarantees, rather than direct lending, was also a way to decrease the fiscal burden.[20]

Private mutual guarantee schemes (MGSs) are private societies created by borrowers to improve their access to finance. They have existed for a long time in OECD economies (OECD, 2012d), and are more developed in Latin America than in other emerging regions.[21] The *tontines* in Africa and other guarantee mechanisms in Asia also offer similar services. MGSs are characterised by the active participation of the private sector, SME organisations and banks in the funding and management of the scheme. They typically have in-depth knowledge of the business cases under assessment, as member firms often operate in a specific sector or value chain. Moreover, as the MGS suffers a loss in case of default, members have strong incentives to monitor closely their peers. This prevents borrowers from excessively risky behaviour and increases the probability of repayment of the loan. Public counter-guarantees to private guarantee schemes are sometimes used to increase their efficiency.

Financial sustainability and additionality are key for avoiding potentially negative distortions of Public Financial Institutions (PFIs)

A rather traditional view of the role of government in financial markets often conflates concerns about the implications of the inevitable distortion arising from intervention and a deep scepticism about the capacity of PFIs to stay free from political interference (World Bank, 2012b). Developing strong risk management capacity is essential if public financial institutions are to fulfil their primary objective of investment in underserved sectors or high risk profile projects. In a number of developing economies, heavy and inefficient government interventions in the banking sector lead to major banking crises.[22] If the situation has greatly improved, national development banks still rate among their top challenges the need to improve governance and to reduce undue political interference (Luna-Martinez and Vicente, 2012). Most national development banks (71%) perceive the need to improve their risk management capacity as their most important challenge. Moreover, for first-tier development banks, as far as can be seen, subsidies for interest rates have fallen out of favour.

Similarly, past experiences in setting up PGSs highlight potential risks associated with this instrument: moral hazard,[23] adverse selection,[24] rent seeking[25] or simply excessive overheads. Indirect financial costs may be high, in particular in the case of PGSs.[26] In turn, they may create inadequate market distortions. If it makes the difference between getting a loan or not, PGSs may significantly decrease the interest rate and extend the maturity of loans. When badly targeted, however, distortions may have negative effects. Some experiences during the 1990s exemplified the perils of ill-defined guarantee schemes where monitoring was insufficient or the response to defaults inadequate (see, for instance, UNCTAD, 2001).

However, the distortion argument detracts from the fact that guarantees are introduced into markets that are not efficient and aim at compensating for (or, ideally, undoing) existing distortions. The complicated trade-off arises when guarantees remove or

offset existing distortions but introduce distortions of their own. Successful experiences among OECD and non-OECD guarantee schemes stress the importance of designing proper mechanisms to limit risks through partial guarantees, limited exposure or enhanced monitoring. In designing guarantees, it is important that they be tailor-made to correct the market imperfection at hand, avoiding moral hazard and adverse selection, as well as excessive contingent public liabilities. More practically, international experience suggests that these guarantee companies represent a powerful instrument to ease SME access to finance, while limiting the direct fiscal burden, assuming that they are properly designed to be financially sustainable and that they target non-bankable firms rather than merely providing more favourable conditions to firms which could access market credit in any case (OECD, 2012d).

Experience from Asian countries highlights the importance of guarantors having sufficient capitalisation and prudent risk management practices (Shim, 2006). Other options include the case of partial credit guarantees, which leave the lender with part of the risk. Variants to partial guarantees include the *pari passu*, where lender and guarantor each absorb a fixed fraction of any loss, and the *first loss*, where the guarantor pays out on all the loss up to some fixed fraction of the total loan obligation (Honohan, 2010). Assessing financial sustainability can in practice be difficult because of the lack of separate financial statements or the recent extension of these schemes. Comparing 76 CGSs across developed and developing countries, Beck et al. (2010) find that younger schemes have lower losses (as measured by the percentage of defaulted loans). Schemes in which the private sector is more involved have on average lower default rates, suggesting that the expertise of private financial institutions is important in appropriately assessing and managing risk.

In turn, there is financial additionality when the credits backed by CGSs would not have been granted without the guarantee. This implies that collateralised creditworthy firms do not normally access the scheme.[27] Indeed, if the state bears the risk that would be normally taken by the private banks, this just consists *in fine* of a subsidy to a private bank or the firms, which could be costly for public spending. The proper design of schemes (i.e. taking into account target population, coverage ratio, risk management and fee structure) is then important. For instance, Bank Rakyat Indonesia (BRI, 2009) concluded that the Indonesian scheme provided guarantees for loans which would have been delivered in any case. Specific targets, and in some cases restrictions, are necessary to guarantee the additionality of public financial institutions. Certain forms of credit (e.g. long-term, innovation-focused) should be encouraged, while some firm profiles (e.g. new firms) should have higher priority than others (e.g. medium-sized firms with access to international markets).

International financial institutions and their role in financial development

In the diverse landscape of public financial institutions, international financial institutions (IFIs) have come to play a significant and increasing role in improving the conditions for the financing of SMEs in developing countries. IFIs refer to the private sector arms of multilateral development banks such as the International Finance Corporation (IFC), European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD), or bilateral development finance institutions such as the 15 members of the Association of European Development Finance Institutions (EDFI), or the 127 members of the Association of Development Financing Institutions in Asia and the Pacific (ADFIAP).

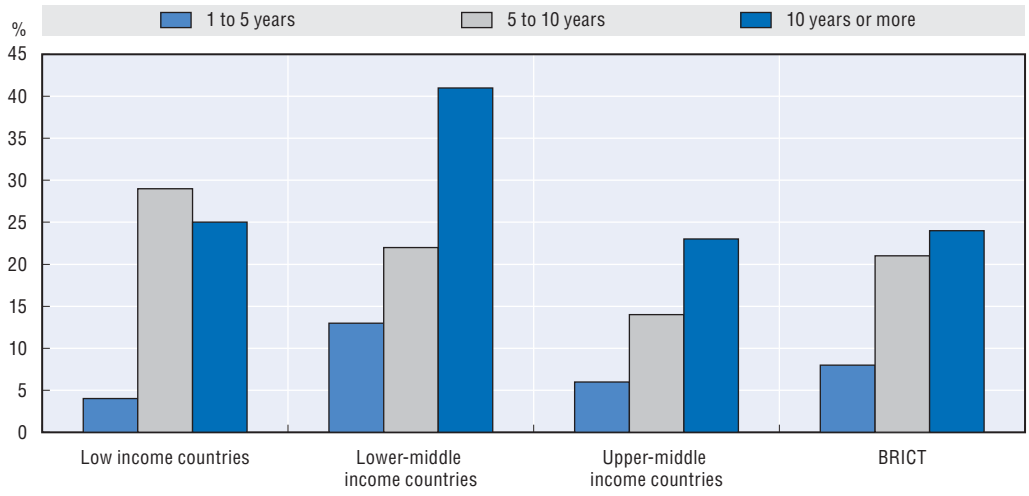
Total IFI commitments to the private sector in developing countries grew significantly from about USD 10 billion in 2002 to about USD 40 billion in 2010 (IFC, 2011).

IFIs can help reduce domestic financial gaps. The return of industrial policy to the development agenda may seem to imply a lesser role for external partners: as previous chapters show, the onus for implementing a strategic vision for development is clearly on the government and its local partners. Yet developing countries lack capacity and resources. That is where IFIs can help: their scope and volume of activities have significantly grown over recent years; their ownership and governance structures limit the risk of capture by interest groups; they can play a catalytic role in attracting other institutional investors. They are well equipped to manage risk and can bring specific expertise.

IFIs have focused on financial sustainability and financial additionality. In the first place most bilateral development banks, also those entirely or partially state-owned, have put in place mechanisms to reduce reliance on governmental budget transfers and public funding. Most EDFI members, for example, are either fully or largely self-financed.[28] In the same vein, 59% of national development banks report the need to become self-sustainable as a key challenge. Furthermore, to enhance additionality, IFIs offer services complementary to those available on the domestic market, including finance with lo.nger maturities. As shown in Figure 6.12, the majority of syndicated loans including IFI participation between 2007 and 2010 have maturities above five years in most developing countries, and above ten years in the case of middle-income countries. For example, FMO, the Dutch Entrepreneurial Development Bank, provides indirect loans to SMEs, via loans to local banks with average maturities of 8 years, as well as equity with investment horizons of 10 to 12 years.

Figure 6.12. **Credit distribution of international financial institutions by maturity, 2007-10**

Percentage of syndicated loans including the participation of an international financial institution



Note: BRICT consists of Brazil, Russian Federation, India, China and Turkey.
Source: IFC (2011), *International Finance Institutions and Development Through the Private Sector*, International Finance Corporation, Washington, DC.

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In addition, IFIs contribute to promoting innovation and technology by providing services adapted to start-ups and innovation-based companies. In countries where capital

markets are shallow, SMEs are very likely to face difficulty in accessing financial services such as equity. Equity participation represents a significant and increasing share of IFI investments. The share of equity and quasi-equity in the EDFI consolidated portfolio grew from 27% to 52% between 2000 and 2011. It represented 26% of the IFC portfolio in 2011. In some cases such as the British bilateral development bank, CDC Group plc (CDC), and the Italian Società Italiana per le Imprese all'Estero (SIMEST), their portfolio is even almost entirely specialised in equity. Equity or quasi-equity represented 96% of CDC's portfolio in 2010 (EDFI, 2010).

Moreover, IFIs provide a large range of financial and non-financial services not always available on the domestic market. This diversity, combined with the greater flexibility offered to SMEs by some of these instruments, allows IFIs to craft tailor-made solutions adapted to the needs of the firm. For young firms in early stages of development, flexibility is an essential dimension to be taken into account when finance is sought. Several IFIs provide, for example, mezzanine capital, a flexible financing instrument sharing characteristics of both debt and equity, though at a relatively higher cost of capital than debt. The repayment terms are usually flexible with requisite moratorium and "pay when able" features that are particularly useful in cases of lack of predictability of cash flow timing. Some IFIs also finance technical assistance (TA) programmes with conditional repayment terms only if the latter contributed to effectively improving the results of the bank or company.

Although IFIs are mostly motivated by private and commercial considerations and not by the priorities set by the local government, they can contribute to building up the financial capacity necessary to enter new sectors. For example, APIDC Biotech, the first biotechnology venture fund in India, formed in 2003 to focus exclusively on the life sciences sector, received the financial support of IFC and NORFUND (Norwegian Investment Fund for Developing Countries). Likewise, NORFUND financed, together with Banco Africano de Investimentos (BAI), the setting up of the first private equity fund in Angola, the Fundo de Investimento Privado Angola (FIPA) (Dalberg, 2010). As a result of limited resources and portfolio size, some IFIs choose to specialise in sectors where they believe they have a comparative advantage. Thus, green technology and energy are becoming strategic areas for many of them. In doing so, they bring the sectoral expertise that a domestic public financial institution with a wider cross-sectoral mandate or private partners might not have.

While national development banks still perceive the risk of political pressure as a challenge, IFIs have put in place mechanisms that help limit the risk of political interference and capture by groups of interest. It is common practice in most IFIs to include independent members on the board and to ensure a balanced representation of public and private interests. For example, CDC has no direct government representation on the board, while the board of the PROPARCO, the subsidiary of the French Development Agency dedicated to financing the private sector, includes investors from both developed and developing countries. Moreover, their high exposure and vulnerability to political and reputational risks have led IFIs to put in place strict control mechanisms and codes of conduct (Kingombe et al., 2011).[29]

IFIs have also put in place co-ordination mechanisms among themselves both for risk management purposes and to ensure greater efficiency. These include co-financing or investment pooling mechanisms. In 2011, 358 projects were jointly financed by the EDFI

Box 6.5. **The Afghanistan Credit Support Program (ACSP) to ease SME access to credit in Afghanistan**

Forty years of conflict have led to a deterioration of business conditions in Afghanistan. The country ranks 168th out of 185 in the overall ranking of the World Bank's *Doing Business* 2013 report and 154th for the "getting credit" dimension. Constraints on SMEs' access to finance partly result from corruption and a weak judiciary system that hamper contract enforcement and collateral recovery. There are also limitations upfront such as the lack of a formal firm registration system and access to information on the firm's credit history. As a result, bank lending tends to be scarce. In 2004 a new banking law came into effect and allowed for the licensing of new banks, but in practice few of them serve the SMEs.

In this context, in order to encourage bank lending to SMEs and reduce risk for local banks lending to SMEs, an initiative was launched in 2005, the Afghanistan Credit Support Program (ACSP), co-funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the US Agency for International Development (USAID) and implemented by the Deutsche Investitions- und Enwicklungsgesellschaft mbH (DEG). The Program foresaw the establishment of a facility offering guarantees for loans issued by selected commercial banks to SMEs. In case of default by the SME, the facility covers 70% of the losses. The current capital stock of the credit guarantee facility is approximately USD 9.1 million. Guaranteed loans have benefited 2 117 SMEs with a cumulative amount of USD 70 million. Three local banks are currently partners of the Program: the First MicroFinanceBank (FMFB), the Afghanistan International Bank (AIB) and the Ghazanfar Bank.

The partner banks were not originally serving the SMEs and needed assistance to upscale or downscale their services primarily targeted at microfinance institutions or large firms respectively and adapt them to SMEs' needs. The Program therefore included a technical assistance component aimed at strengthening the banks' SME lending capacity though the establishment of SME credit technologies as well as the provision of advisory services for human resource selection and training.

Source: Interview with a DEG representative, Cologne, 24 September 2012; Discussions at an OECD-EDFI workshop on SME financing, Paris, 13 June 2012.

members, which included 243 country specific investments and 115 regional investments (EDFI, 2011). These investments are in some cases carried out through formal mechanisms such as the European Financing Partners (EFP), a joint venture between 12 EDFIs and the EIB to leverage mutual expertise and pool funding (with associated limits to individual risk exposure).

New instruments targeting SME needs in emerging economies

A menu of different financing instruments, more adaptable to the needs of the firm (according to size or sector), is present in emerging economies: initiatives to support SMEs in specific sectors, global value chains, export-oriented and innovation-based firms, and others have been increasingly common. Among them, innovation-based and technological firms have received special attention, with incubator programmes and seed capital programmes targeting these sectors.

The reverse side of the additional need for (and the lack of) guarantees and the typically higher interest rates faced by SMEs is their relative opaqueness, as a result both of the lack of a credit track record (a "Catch-22", given that in many cases it is precisely the

limited access and steep costs that keep them out of credit markets) and of a lack of information and knowledge of the procedures. This makes it difficult for SMEs to use many of the available instruments. To mitigate these barriers, two policies that have been proposed by most experts and embraced by financial authorities are the introduction of credit bureaux to mitigate information asymmetries and the provision of non-financial services such as counselling and capacity-building programmes on management and accounting to enhance the awareness of financial instruments and available funding vehicles.[30]

Innovative programmes, including special funds for innovation and exporting firms and non-financial assistance, have helped SMEs

Leasing and factoring mechanisms have been successfully introduced in emerging economies to respond to the particularities of the SME sector and monetise short-term receivables from credits with good access, thus reducing the duration of the chain of payments. One advantage of factoring is that firms can obtain immediate liquidity on credit sales during a certain period, improving the cash flow of the firm and transferring the risk of non-payment. Electronic factoring, in particular, allows for immediate payment (with liquidity provided by a financial institution), and is more prevalent today. The expansion of online banking services has allowed these instruments to expand (Ferraro, 2011). Instruments for financing value chains have been introduced in some countries with success. In Mexico Nacional Financiera (NAFIN) proposes technical and financial assistance to SMEs with its Programa de Cadenas Productivas. The programme takes into account the need for these actors to co-operate and strengthen networks to increase international insertion into global value chains.

A lack of financing continues to handicap the creation of enterprises in most emerging economies. Because of the absence of credit records and tangible capital, banks tend to consider young firms as high-risk clients, which leads to high levels of self-financing or financing through informal channels. Public intervention in this area is essential, as many of these firms can be particularly dynamic and contribute to overall productivity and employment. These initiatives should target the firm at different stages (birth, starting-up, growth, consolidation) and therefore different instruments are needed: seed capital, angel investors and risk capital.

Efforts to support enterprise creation have been significant in some countries, in particular for high-growth and technology firms. Little evidence exists as to the impact of these policies, which include firm incubators, seed capital programmes and risk capital initiatives, and the lack of a proper evaluation system is critical. At the birth level, assistance tends to focus on technical support and firm incubation. At this stage public efforts are not primarily financial: rather, they seek to provide assistance to SME promotion agencies oriented towards strengthening firm incubators or local support centres. In turn, seed-capital programmes have been extensively used in emerging countries to support the SME sector. Finally, at the growth and consolidation stage, external finance often takes the form of angel investors and venture capital. To foster the development of angels and venture capital, public agencies and development banks have promoted the setting up of investment funds. Brazil has developed different initiatives for promoting private equity and venture capital funds, regulated by the Comisión Valores Mobiliarios (de Matos and Arroio, 2011). Chile and Colombia are also examples of the promotion of private equity funds.

Microcredit has become another instrument for reducing financing gaps for micro and small enterprises

Around 50%, 60% and more than 70% of firms are considered to be microenterprises in Latin America, Asia and Africa respectively (IFC, 2010). Microcredit is often characterised by small, short-term loans (less than a year maturity), with reduced repayment periods. The perception of microloans as a high-risk, low return financial arrangement prevails today in some regions (Sengupta and Aubuchon, 2008). The instrument has, however, rapidly increased in respect of the average loan amount and the client base in most developing countries. The net average margin of microfinance institutions is not substantially different from that of other financial institutions, while the ratio of non-performing loans is higher, yet relatively low compared to the volume of loans.[31]

Microcredit has acted as a catalyst for facilitating access to formal financial services in sectors where these are scarce. Microfinance institutions often provide a setting for improving financial literacy among the client base, and serve as starting points for improving financial penetration. Despite the financial profile of the target population, most microcredit demands receive a positive response from financial institutions and in general they are perceived as profitable activities, with a slightly higher risk than other forms of retail banking. As individuals and firms manage to build a credit history in microcredit institutions, they will be able to demand more formal financial services in the future.

Conclusion

Lack of access to finance is a major handicap for countries looking to upgrade their productive capacity and speed up their economic convergence. It hampers the short-term credit that is important to finance working capital in general and which is also crucial for many firms to survive in a volatile macroeconomic environment, as well as the long-term lending that is essential for investment. Moreover, many firms do not have access to formal financing instruments at all, in particular SMEs and firms in non-traditional sectors, because of their high financing costs, persistent information asymmetries and the accordingly higher collateral requirements. And where there is access, firms can often count only on short-term working capital financing.

Banks have few incentives to provide loans to new sectors which are essential to productive development. Beyond the high risk and the sometimes very long-term perspectives in these sectors, structural factors on both the demand and supply sides explain the persistent and growing difficulty for firms in general, and SMEs in particular, to access credit. Recent trends in the banking business model also help explain these gaps. The transition from relationship lending to multiservice banking has had adverse implications on the provision of credit, hitting SMEs in particular which, because of high fixed issuance costs and their limited scale, cannot compensate by borrowing in capital markets. The importance of funding and the existence of market imperfections combined with structural shifts that are leaving non-standard borrowers increasingly underfinanced *vis-à-vis* large companies, underline the need for public intervention and a more active participation in the financial sector through public financial institutions, the provision of guarantees and technical assistance to diminish information gaps.

Development banks play a key role in sectors with strategic importance or future prospects, or in providing countercyclical credit in bad times. They have a different

approach to performance, beyond considerations of profitability, risk and liquidity. There is a recent transition towards a combination of first and second-tier banking institutions which has proved beneficial in some countries. CGSs have gained ground as effective instruments for public action in a number of developing and emerging economies. They can be either public or private (often with governmental support). There is criticism, in particular regarding public schemes. Nevertheless, public and private CGSs have shown themselves useful, if some conditions are met. Like their domestic counterparts, IFIs have been critical in enhancing financial access. Their ownership and governance structures limit exposure to risk of capture by interest groups, foster financial sustainability and play a catalytic role in attracting other institutional investors. They have developed strong risk management capacity and provide tools that are not always used by domestic development institutions, as well as specific expertise.

This chapter has also emphasised the increasing role of IFIs in facilitating access to finance for SMEs. IFIs have paid careful attention to their governance standards and played a catalytic role both in attracting other institutional investors and in bringing specific expertise. They are an integral part of the development finance agenda, in response to the broadening policy space in developing countries. Enhancing the complementarity between development finance institutions and other actors (e.g. private funders, South-South co-operation schemes) is also in line with the objectives of the Busan Partnership for Effective Development Co-operation, where the role of the private sector is stressed.

Innovative financing mechanisms for SMEs have also been promising. These include factoring, incubator funds, seed capital funds and the configuration of a risk capital market. On-line access to some of these instruments has expanded their use. Public policies aimed at stimulating private equity funds are also important, in particular for firms with innovation or technology bases. These latter require specific policies, at both early and later stages of development. Support for the early stages of these firms is essential, by favouring the creation of firm incubators, seed-capital funds or the participation of angel investors. Venture capital investors should focus on later stages of development. Given the sparse development of these mechanisms, it is necessary to set up adequate incentives to encourage higher private participation, for example through tax exemptions for investors.

There are still major information asymmetries between SMEs and the financial system. Policies aiming to improve regulation for disclosure requirements, to train firm managers and local banks in legal and accounting practices, as well as to improve the availability of financial instruments, are important. Financial and technical assistance for SMEs need to come hand in hand. Together with the creation of new instruments and institutional strengthening, the introduction of monitoring mechanisms is relevant in assessing the effectiveness of programmes and their effects on development (productivity, employment creation), catalysing other financial actors and knowledge transfers.

Notes

1. The rate of approval of SME loans over the past decade is high in countries such as Argentina or Brazil, where 80% of applications were granted.
2. Compared to banking loans, funding through capital markets would reduce the downside risk for the firm, as it has to reimburse a fixed cost independently of its performance. A bank loan like any other form of finance carries a default risk on the downside, but unlike, for example, venture capital has no claim to the upside in the case of success. In an environment where defaults are

plentiful, but some companies will be highly profitable, equity investors will invest whereas banks will have to charge crippling interest rates to offset the default risk. However, the shallow development of equity markets make SMEs rely mostly on the banking channel for external funding.

3. By contrast, 75% of firms in OECD countries find the equity gap to be more important, compared to 60% in emerging economies. This is probably explained by the shallow development of risk capital instruments in non-OECD economies.
4. The absence of collateral is often quoted as one of the main obstacles for SMEs in accessing financing according to the World Bank Enterprises Surveys. In most regions, the main sources of collateral are fixed assets (e.g. buildings, machinery and equipment), with a higher dependence of small and medium firms on personal assets.
5. For the sample, see Figure 6.2.
6. In general, foreign banks are more efficient than domestic banks and high foreign presence is associated with lower net interest margins, lower general costs and higher profitability than domestic banks.
7. However, this approach had costs: interest rates for SME loans tended to be high, given the more intensive process of collecting soft information (World Bank, 2011). There was also a higher risk of capture of firms by the financial institution, given the cost of switching banks and losing the intangible collateral (the personal knowledge built over years of financial transactions).
8. Based on Dealogic database, an estimation of the distribution of corporate bonds (first and secondary market) among emerging economies by firm size, between 1990 and 2010, shows that large firms are by far (98%) the only ones to have recourse to this instrument. Small and medium-sized firms (defined by number of employees) are excluded.
9. It is still a practice adopted by 50% of the surveyed national development banks, 66% of which are funded by budget transfers.
10. In 2009, the Business Development Bank of Canada undertook a study which looked at 373 development institutions from 92 countries and 7 economic regions around the world.
11. By definition, an SME usually means less than 250 employees and typically more than 5 (fewer than 5 employees would be classified as a micro enterprise).
12. Eslava, Maffioli and Meléndez (2012) analyse the effect of long-term loans of Colombian development bank (Bancoldex), finding an overall positive effect on employment, investment and productivity.
13. The countercyclical role is also justified by the risk-spreading argument proposed by Arrow-Lind: as the state is risk-neutral (given its capacity to spread risk both over-time and cross-sectional) while private banks' risk aversion is pro-cyclical (banks are exuberant at the peak of the economic cycle but their risk aversion overshoots at the cycle trough), there is justification for a risk absorption role for the state during economic downturns.
14. For example, in response to the 2008 financial crisis, ALIDE (Latin American Association of Development Banks) increased their total assets by 30%.
15. Infrastructure development is not only a key element for long-term industrialisation, but it has been a counter-cyclical tool during the recent crisis in East Asia and Latin America.
16. A recent survey on development banks shows that 96% of them publish annual reports, and 93% disclose audited financial statements.
17. The survey shows that 75% of development finance institutions allow the participation of independent members, while 91% require board members to have a minimum of education and technical qualifications, and 75% require members not to have a bankruptcy record.
18. Or, more broadly, to ensure that private financing becomes available (in areas such as infrastructure project finance and loans to SMEs) which would otherwise not be feasible due to credit rationing.
19. For instance, in 2010 the Korean Credit Guarantee Fund (KODIT) launched the "Online Loan Market" project, aimed at improving the exchange of information between borrowers and lenders.
20. While in some countries the volume of guarantees has greatly increased in recent years and started to become significant (India), in most cases it remains small relative to the volume of loans.

21. In Latin America, some international associations, including the Asociación Latinoamericana de Entidades de Garantía (ALEGA) and the Red Iberoamericana de Garantías (REGAR), group a large number of schemes.

22. See for instance Daumont et al. (2004) for banking crises in ten sub-Saharan African countries in the period 1985-95.

23. The most common response of agencies to potential moral hazard is to leave a material portion of the risk with the client. Another response is to require a counter-guarantee from the central government. Private insurers have a different approach, which is to offer 100% comprehensive cover against all risks, the cost of which is a higher premium and vigorous action against defaulters.

24. Because of information asymmetry, they may increase risk where it biases the portfolio of assets held by banks and companies, and attract the more risk-prone amongst the insured population. Guarantees would make this prospect worse if they discouraged banks from making all due enquiries about the creditworthiness of borrowers.

25. Where the lender/investor would have proceeded without the guarantee, the latter confers an unnecessary benefit on the party concerned. Where lenders and investors seek guarantees as a means to obtain extra benefits, without any more outlay of resources, this would be an example of rent-seeking behaviour.

26. As public guarantee schemes are not normally required to make a profit, guarantees offered may be under-priced, in the strict insurance market sense. In this case, there is an indirect cost, consisting of the reduction of public expenditure elsewhere (or alternatively, extra taxation raised) in order to create the contingency reserve necessary as cover for the guarantee programmes.

27. This means that *i)* low-risk firms with high creditworthiness but, for instance, lack of collateral, continue to obtain finance on financial markets; and *ii)* projects with a higher risk profile, which are socially desirable, encounter finance for their needs.

28. In some cases, to limit their risk exposure, bilateral banks also solicit the direct participation or financial backing of their home country government, as in the cases of MASSIF and FISEA, two investment funds respectively held by the Dutch and French governments.

29. Yet, some IFIs still follow and depend on objectives defined according to home country interests. For example, the Italian and Spanish development banks, SIMEST (Società Italiana per le Imprese all'Estero) or COFIDES (Compañia Española de Financiación del Desarrollo) have the explicit mandate of promoting home country companies or marketing home country products and services.

30. Examples of these initiatives are SEBRAE in Brazil and the Programa de Extensionismo Financiero in México. SEBRAE has been carrying out initiatives to reduce information asymmetries through capacity building for entrepreneurs and banks, and the strengthening credit co-operatives and microfinance institutions for the SME sector. The same can be said about the Programa de Extensionismo Financiero in Mexico, which assists a pool of SMEs through an executive group counselling on financial instruments, necessary procedures and management of financial information (Ferraro, 2011).

31. The average morosity for Latin American banks and microfinance institutions in 2011 was 2.6% and 3.7% respectively, (Martinez 2012), although the financial crisis naturally brought an increase on non-payment rates on both groups.

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Chapter 7

Bridging infrastructure gaps

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. These economies therefore need to invest more in infrastructure but above all to improve the effectiveness of public infrastructure policies. Co-ordination between different agencies in charge of such policies is essential for overcoming multiple gaps, including coverage, access and costs. Using recent data from a survey of policy makers, this chapter identifies ways to improve the policy-making process for infrastructure and the management of public and private financing options.

Introduction

Inadequate infrastructure hampers production and competitiveness in developing economies. About 60% of the world's infrastructure stock is located in high-income countries, 28% in middle-income countries and 12% in low-income countries. Scarce and inefficient transport infrastructure can raise logistic costs above the international average. For example, poor transport infrastructure in Tanzania raises these costs and limits the potential for developing horticultural processing on a large scale: up to 40% of the value of fruit and vegetables is lost after the harvest and only 4% of these products are processed. Energy shortages in India threaten its manufacturing development. At 68 GW, the generation capacity of the 48 sub-Saharan countries is equivalent to that of Spain (Foster and Briceño-Garmendia, 2010).

Current levels of investment in infrastructure in developing countries are insufficient. In developing countries in 2009 there were about 1 billion people with no easy access to all-weather roads, about 1.5 billion people living without electricity, 800 million without access to safe drinking water and 4.7 billion people without access to the Internet. Although infrastructure gaps and needs are not easily estimated with existing data, a consensus exists on the inadequacy of investment levels in developing countries, which vary between 3% and 4.5% of gross domestic product (GDP) per year (Estache, 2010). These numbers fall short of the annual infrastructure expenditures that developing countries ought to invest between 2008 and 2015, which are in the range of 6% to 7% of GDP, or about USD 1.1 trillion (Yepes, 2008). According to this estimate, electricity and transport are the sectors with the largest financing needs over that period and would absorb 46% and 35% of total expenditure, respectively. Actual needs might be larger than those estimates, which assume unconstrained observed aggregate demand in infrastructure.

Investment in infrastructure is mainly financed by the public sector. Between 70% and 78% of total infrastructure investment in developing countries is currently covered by the public sector (Estache, 2010). Private funding ranges between 19% and 25% of total investment – mostly in information technologies – while Official Development Assistance (ODA) accounts for between 3% and 8% of total investment, mainly in transport and electricity.

Infrastructure shapes growth through a variety of channels. Infrastructure investment affects aggregate output directly by altering the composition of input factors in the production function: it increases the aggregate capital stock, lowers the cost of intermediate inputs and can have a complementary impact on the aggregate hours worked by the labour force. It can also have indirect impacts by affecting productivity through economies of scale and scope, lowering the logistic costs of investments and freeing up resources for private investment, improving the durability of private capital and altering labour productivity by shaping industrial organisation and work practices.[1] Moreover, infrastructure is not only a public good in itself, it also enters the production function through the services it provides: transport needs are connected to trade; energy and water

to health concerns; and information technologies to knowledge and business opportunities.

The integration between infrastructure and industrial policies should help boost sustainable development. Infrastructure should be a key element for the development agenda in developing countries. In particular, the development plans should include infrastructure as a determinant enabler for the initiatives of industrial policies. For instance, the Growth Acceleration Programme (*Programa de Aceleração do Crescimento*, PAC) in Brazil or the National Development Plan (*Plan Nacional de Desarrollo*) in Colombia includes infrastructure investment as a key pillar for industrial development.

Greater investment in infrastructure is needed, but better management of its policy cycle is required too. The design and process of infrastructure policies matter as much as finance in enhancing economic growth. The quality of investment is affected by both the composition of these investments and the sequencing of the supporting reforms (Straub, 2008). In terms of the composition, a bias is often observed towards the implementation of new investment – more visible politically – to the detriment of the maintenance of the existing infrastructure stock, with major negative effects on the quality of the latter, including higher operational costs for both the infrastructure and the private goods and services that depend on it (Dewatripont and Seabright, 2006). This chapter analyses the infrastructure challenges of developing countries and focuses on policy options. It describes the policy cycle and presents evidence from an original survey of policy makers in developing countries. It focuses on co-ordination requirements and on public and private financing options for infrastructure building and upgrading. It analyses the most challenging phases of the budgetary process in the allocation of funding through the national budget. It also analyses the design and performance of concessions in the transport sector. It concludes by stressing the need to align infrastructure investments with production development strategies to increase the effectiveness of investment.

The policy-making process in infrastructure

The policy-making process can affect the nature and quality of public policies in infrastructure. Public policies are the translation of the political priorities and principles of governments into programmes and courses of action to deliver the desired outcomes (Goodin et al., 2006). They emerge from a policy-making process: that is, a decision-making process involving a multiplicity of actors who interact in a variety of arenas. In view of the complexity of this process, it is fundamental to understand how it operates before designing public policies. More investment in infrastructure does not necessarily affect economic growth beyond the simple physical capital accumulation effect. A policy-making framework is needed to promote such investment in ways that are conducive to increasing economic growth through efficiency-enhancing externalities. Essential aspects of the decision-making process, such as assessing the costs and benefits of new investments and creating independent regulatory institutions, are key to efficiency (Égert et al., 2009). This section analyses the policy-making process in infrastructure based on a survey of policy makers in developing countries (Box 7.1). This survey identifies four phases: *i)* prioritisation and planning; *ii)* execution; *iii)* operation and maintenance; and *iv)* monitoring and evaluation. Although all four phases overlap to varying degrees in the real world, such a framework helps understand better the prerequisites, elements and consequences of policy making. In each phase governments have to consider assessments, accountability and oversight

mechanisms to evaluate correctly the progress of the project. Appropriate allocation of responsibilities at each phase and adequate integration of policies throughout the whole project cycle help improve the effectiveness of public policies in infrastructure.

Box 7.1. **OECD Development Centre survey on the infrastructure policy-making process**

This section is based on a survey conducted by the OECD Development Centre that attempts to identify the main bottlenecks hindering effective infrastructure service delivery throughout the policy-making process. Derived from the OECD Survey on Water Governance (OECD, 2011a), it was directed at policy makers in the infrastructure and transport sectors at national level: at the ministries of finance, planning or infrastructure or at the national development and planning agencies for information on general infrastructure, and at ministries of transport for transport-specific information. Respondents first completed an online survey and then complemented their answers by bilateral discussions. The survey was carried out in 2011-12 in Latin America (Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Mexico, Paraguay, Peru and Uruguay), Africa (Benin, Botswana, Burundi, Cameroon, Cape Verde, Chad, Djibouti, Gambia, Kenya, Madagascar, Mauritius, Niger, São Tomé and Príncipe, the Republic of the Sudan and Tunisia), Asian and Pacific countries (Afghanistan, Bhutan, Samoa, Timor-Leste and Vanuatu) and in Southeast Asia (Malaysia, the Philippines, Thailand and Viet Nam). Consequently, this survey covers 21 emerging economies and 14 LDCs – Least Developed Countries – (Afghanistan, Benin, Bhutan, Burundi, Chad, Djibouti, Gambia, Madagascar, Niger, Samoa, São Tomé and Príncipe, Sudan, Timor-Leste and Vanuatu).

This survey can be considered as a key input into the analysis of the effectiveness of public policies in infrastructure that complements existing quantitative surveys. However, because it is based on stated, and not on revealed, preferences, it is subject to possible biases. In addition, cross-country comparability is subject to preferences that vary from country to country. Finally, survey answers may be affected by the dominance of certain types of infrastructure in policy-making processes.

Source: Nieto-Parra et al. (2013) for Latin American countries.

According to 19 out of 21 emerging economies, the phase of prioritisation and planning is the most challenging in the policy-making process. In contrast, only 4 of the 14 LDCs in the sample considered it as such. 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 contracts awarded without definitive designs or prior land studies, often without property rights to the land (Égert et al., 2009). These factors cause delays and cost overruns (Nieto-Parra et al., 2013; CABRI 2010a). Furthermore, in several countries the national system of public investment does not check for the social impact of prospective projects before initiating them.

A sequence of activities – identification, screening and appraisal – is needed in the prioritisation/planning phase of an infrastructure project. Governments are usually called upon to undertake more projects than they can afford. A rigorous approach can help select

those that provide the greatest net benefit to society and can be implemented efficiently (Fischer et al., 2007):

- Identification: A sector review linking planning at the macro and project levels is crucial.
- Screening: Before deciding whether to start the phase of project appraisal, a project profile should identify measurable objectives, specify the needed resources, identify the main constraints and put forward alternative means of attaining the project's objectives.
- Project appraisal: A complex and recurrent process that seeks to provide a comprehensive assessment of the investment.

An infrastructure project appraisal should take into account financial, economic, technical, distributional, regulatory and environmental elements (Box 7.2) as well as risk assessments. Cost-benefit analyses can help assess the project's potential impact on social welfare, but they are based on difficult choices over what to include under both costs and benefits, and there is little consensus on how to estimate the impact of risk (OECD/International Transport Forum, 2011).

Box 7.2. **Green infrastructure in developing economies**

In a "business as usual" scenario, meeting the rising global demand for food, energy and infrastructure will soon exceed the world's ecological carrying capacity. Reframing the conventional growth model presents both challenges and opportunities. In developing economies, given the magnitude of infrastructure deficits, the potential for technology leapfrogging and climate-resilient implementation is high. Green infrastructure investments can help avoid being locked into inefficient patterns of growth with high environmental costs.

Finance is one of the main constraints to implementing green infrastructure projects. Today, green technologies cost more than conventional fossil-fuelled technologies. Given that the required infrastructure investments are in the order of USD trillions, developing economies need to leverage investment through public-private partnerships, a mixture of tariffs and taxes, development assistance and facilitation by institutional partners. A vast pool of capital under management by institutional investors (USD 71 trillion in 2010) could be attracted by green bonds in infrastructure. Yet green investment remains small compared to the needs. The market size for all green bond issuances to 2011 was approximately USD 11 billion and environmentally focused Official Development Assistance (ODA) amounted to USD 25.4 billion in 2009/2010. Infrastructure projects are often conceived as small-scale (e.g. wind and solar), which provides incentives for bottom-up innovation but also delays the transformation of the system as a whole.

Source: Mathews (2013), OECD (2011b) and OECD (2012a).

The execution phase is the most challenging for LDCs. In the sample, 10 out of 14 LDCs identified the execution phase as the most complex in the policy-making process, alone or together with other phases. Large projects often encounter costs and time overruns during the construction. Few projects procured (or acquired) internationally are actually completed within the budget and time-frame originally estimated by the project's sponsor. These systemic failures often arise from the inability to manage risks adequately (CABRI, 2010b). In terms of broad risks, inflation and exchange rate fluctuations can have a significant impact on project financing. Political interference, community participation

and environmental compliance are also factors that affect the implementation process. At the project level, some of the bottlenecks in execution are explained by the lack of an appropriate design of the project. Poor project management, changes in design, lack of finance or delays in payment for services, unexpected ground conditions and unsettled land acquisition claims are among the most important implementation risks. Shortages of construction materials and equipment are also common, as well as an inability to find experienced contractors and technical staff in the public administration.

Policy makers must assess broad and project-level risks as part of the prioritisation/planning phase to ease the implementation phase. The aim of risk management is to identify and manage those risks that could derail implementation. The line ministry or sponsoring agency has primary responsibility for this process, but when risks relate to financing, the ministry of finance should step in (CABRI, 2010b). In fact policy makers must take risk management into account throughout all phases of the project, which are all interdependent. Implementation is a political process in the course of which policies are often reshaped, redefined or even completely overturned (Égert et al., 2009).

The operation/maintenance phase also presents deficiencies across surveyed regions. A government's best plan for some future period may not be optimal when that period arrives. Governments prefer to finance new investment during their political cycle and postpone the less visible maintenance activities to later cycles (OECD/ECLAC, 2011). Some countries have established budgetary rigidities as a way of guaranteeing resources for road maintenance but challenges remain. For instance, the Growth Acceleration Programme (*Programa de Aceleração do Crescimento*, PAC) in Brazil does not include adequate levels of operation and maintenance spending to preserve the infrastructure stock. For this purpose, authorities could set specific rules to quantify the yearly operation and maintenance costs of existing and planned infrastructure, and incorporate them into multi-year budgets (Mourougane and Pisu, 2011). Furthermore, aid-recipient countries should adequately account for maintenance costs in infrastructure projects where their construction is funded by donors.

Co-ordination of infrastructure policies

The characteristics of the policy-making process are decisive in delivering the desired outcome. Policy makers and researchers usually stress the importance of stability (sustaining policies over time), adaptability (responding to changing economic conditions when policies are failing), co-ordination (of multiple actors), public interest consideration (policies promoting the general welfare) and effectiveness in policy implementation and enforcement (Stein et al., 2008; Berkman et al., 2009). In some cases, these characteristics matter as much as the broad policy orientation (Rodrik, 1989).

Insufficient co-ordination among stakeholders is a major challenge. According to the survey, co-ordination is a more relevant challenge in emerging economies than other features of public policy, such as the stability, adaptability, public interest consideration and effectiveness of policies.[2] In the sample, 12 out of 20 emerging economies identify co-ordination as the major bottleneck, alone or together with other characteristics of the policy-making process.[3] It is worth noting that 6 out of the 14 LDCs in the sample do so as well. Respondents point to the gaps between design and operation/maintenance, mainly because of the proliferation of public agencies, the duplication of their functions, and in some cases the direct competition between them.

Co-ordination failures reflect the complexity of the institutional framework. Regardless of the development stage, all policy makers stress the complexity of the policy-making process in infrastructure, which involves numerous actors and steps at each phase. For some countries, this institutional complexity is rooted in the decentralisation process that started in the mid-1980s (Bouckaert et al., 2009). Until the early 1980s, in both OECD and non-OECD countries, monolithic multi-objective ministries included all phases of the policy cycle. Since the mid-1980s these ministries have been dismantled into smaller single-objective organisations, each granted a certain degree of autonomy. Autonomous agencies multiplied in the public sector, splits were introduced between policy design and implementation, and between politics and administration. The policy-making process evolved from a consolidated cycle to a fragmented one, seeking efficiency gains through specialisation (Bouckaert and Verhoest, 2005). However, fragmentation may have gone too far in some cases, resulting in a suboptimal focus on agency outputs instead of policy outcomes, a lack of critical mass in policy capacity, and high transaction costs between the components of the policy-making process and between agencies (Christensen and Lægreid, 2006). Overall, policy makers have a weaker control over the policy-making process in infrastructure as a whole.

Better horizontal co-ordination among public agencies is required if specialisation strategies are to increase efficiency in infrastructure service delivery. Both OECD and non-OECD countries are attempting to reduce the costs of organisational and policy fragmentation in the public sector by establishing co-ordination mechanisms. Since the mid-1990s, they have been promoting horizontal co-operation and integrated service delivery across public organisations. In some cases this has led to a reconsolidation of the policy cycle phases and a decrease in the number of organisations. Examples of upcoming mergers of ministries and agencies include Kenya (transport, water and sanitation) and Mauritius (water and waste management). Besides a few cases where policy phases have been reintegrated and agencies merged, hierarchy-type mechanisms are trying to reconcile better strategic control of the state apparatus with flexibility and autonomy for service providers (Richards and Smith, 2006). Overall, the organisational autonomy of agencies should be regulated more strongly, but not systematically reversed (Bouckaert et al., 2007). The merger of agencies is justified, for instance, when fragmentation was not chosen on efficiency grounds or when institutional capacity is insufficient.

Various challenges prevent effective vertical governance (i.e. multi-level governance) in infrastructure. Whereas national governments dominate all phases in the policy-making process, greater involvement of sub-national governments could reinforce local citizen participation, reduce information asymmetries and help local preferences be better reflected (Charbit, 2011). However, the survey shows that funding and capacity gaps strongly compromise the participation of sub-national governments in infrastructure projects in non-OECD countries.[4] These factors also appear as the most penalising in multi-level water governance in 17 OECD countries (OECD, 2011a) and in 12 Latin American and Caribbean countries (OECD, 2012b). In addition, many countries in Latin America point to the consequences of heterogeneous and fragmented responsibilities of sub-national governments on the infrastructure policy-making process (OECD/ECLAC, 2011; OECD, 2012b). Most countries experience this "policy gap" because infrastructure responsibilities are scattered across several line ministries that take purely vertical approaches, without exploring complementarities between policy fields. Lastly, the mismatch between administrative and functional boundaries also prevents effective vertical governance. This

"administrative gap" occurs when the administrative scale in the policy-making process does not correspond to relevant functional areas, e.g. where excessive administrative fragmentation in large infrastructure projects prevents economies of scale (Allain-Dupré, 2011). In contrast, Korea has been targeting "functional regions" to promote infrastructure development, amongst other sectors (Box 7.3).

Box 7.3. **Targeting functional regions for regional infrastructure development in Korea**

Addressing regional development requires strong political support and a mechanism for targeting resources at regions. In the 2000s Korea established a Presidential Committee for Regional Development, assigned a specific budget to regional development by the creation of a Special Account, and identified different spatial scales for targeting resources to regions. The Special Account for Regional Development had the twin objective of increasing resource transfers to regions and implementing specific national programmes outside the Capital Region. It increased from KRW 5 327 billion (Korean won) in 2005 to KRW 9 853 billion in 2011, raising its share of total central government expenditure from 2.5% in 2005 to 3.1% in 2011. The committee identified four relevant scales for policy action according to the type of intervention:

- 5 *supra-economic regions* for infrastructure development, including transport and logistics networks for export-oriented industries, as well as cross-regional collaboration in technological development;
- 5 + 2 *economic regions* to further cross-provincial collaboration for implementing regional industrial policy;
- 13 provinces with specific programmes already being implemented;
- 163 local areas to deliver better social services, including health care and housing, targeting mainly villages and small provincial cities.

Source: OECD (2012c).

Several tools can help improve vertical governance in infrastructure. In terms of financing, the definition of technical plans at sub-national level can generate incentives for the transfer of resources from the national government (OECD/ECLAC, 2011). Nevertheless, sub-national infrastructure plans may not be systematically suited to smaller countries as they may counter the externalities inherent in large infrastructure projects. Furthermore, the national government can control sub-national governments and identify bottlenecks through performance indicators monitoring infrastructure service delivery. These indicators should be comprehensive and encompass both supply and demand factors.[5] In China, sub-national governments are held accountable only according to a GDP indicator, which tends to encourage over-investment in infrastructure. To bridge co-ordination gaps in vertical governance, some OECD countries have implemented other instruments, such as contracts between levels of government, co-funding agreements, inter-municipal co-ordination and citizen and private-sector participation (Charbit, 2011).

Financing infrastructure: Public investment

In some scenarios, markets can fail to provide efficient and equitable infrastructure delivery.[6] This mainly rests on the following notions:

- *Externalities:* When one individual affects the well-being of others, public intervention should induce the individual to consider the collective and not only the private costs and benefits of his/her behaviour. Externalities can be positive (e.g. street lighting, telephone access) or negative (e.g. water pollution, road congestion).
- *Economies of scale:* When it is more efficient to produce output through one firm rather than several. Since the firm can restrict its output to a level below that which would prevail under competition, the government should provide or regulate the service. Economies of scale exist, for instance, in roads, water and sewage services, wired telecom networks and power distribution.
- *Non-excludability*: When it is impossible to exclude individuals from consuming the good. Very large irrigation schemes often fall under this definition (Repetto, 1986).

The budgetary process in infrastructure

The national budget is a government's central instrument for economic management, reflecting the values and strategies of the country (Fyson and Recuero Virto, 2010). The budgetary process involves four phases: *i)* budget preparation, a recurring procedure with input from line ministries and executing agencies on projected costs and incomes; *ii)* budget authorisation, where the alternative projects are presented to the constituencies for approval; *iii)* budget implementation, including budget execution and accounting and monitoring of budget execution; and *iv)* reporting and auditing of the process. The approach in which these phases are designed and implemented influences the degree of aggregate fiscal control, strategic resource allocation, operational efficiency and external transparency.

Developing economies need to find the adequate balance between increasing fiscal discipline and accountability on the one hand, and improving demand identification, network integration and cross-sectoral synergies on the other. A centralised budget process is usually associated with tighter fiscal discipline and enables decision makers to have a comprehensive view of the total costs and benefits of public policies.[7] Political agents aware of the full budget constraints have incentives to moderate the progression of fiscal expenditure. Detailed budgets and central management rules originally came into place to prevent corruption, and therefore relaxing central input controls may not work in all environments. Moreover, a centralised budget process provides incentives for policy makers to take into consideration the integration of service delivery across networks that cover wide geographical areas. In contrast, a less centralised budget process that involves sub-national agencies and state-owned enterprises can increase accountability and responsiveness (Jimenez, 1995). In addition, national authorities may have less information than sub-national ones, which can lead to resource misallocation. Moreover, a vertical approach to investment can prevent complementarities across sectors (Allain-Dupré, 2011).

The budgetary process in infrastructure investment is relatively centralised at the national level in African countries, and in Asian and Pacific LDCs. A joint survey by the OECD Development Centre and the Collaborative Africa Budget Reform Initiative (CABRI) finds that national governments prepare and implement the bulk of infrastructure public investment (Box 7.4). Participation of sub-national governments in the infrastructure

budgetary process is low, although increasing. In the countries surveyed, taking into account financing and capacity constraints, sub-national governments should participate in the preparation of the budget to reduce information asymmetry with the national government in respect of infrastructure demand.

Box 7.4. **Joint OECD Development Centre-CABRI survey on public investment in infrastructure**

This section is based on a survey conducted by the OECD Development Centre and CABRI to identify the main bottlenecks in public investment throughout the policy-making process that hinder effective infrastructure service delivery. Based on the OECD Budget Practices and Procedures Survey (OECD, 2007a), it is directed at policy makers in infrastructure planning sectors at the national level, in the ministries of finance, planning or infrastructure or at national development and planning agencies. Policy makers first completed the survey online and then complemented their answers by telephone. The survey was carried out in 2011 in Africa (Benin, Botswana, Burundi, Cameroon, Cape Verde, Chad, Democratic Republic of Congo, Djibouti, Gambia, Kenya, Lesotho, Madagascar, Mauritius, Morocco, Namibia, Niger, Rwanda, São Tomé and Príncipe, Sierra Leone, the Republic of the Sudan, Tunisia and Zimbabwe) and in some Asian and the Pacific LDCs (Afghanistan, Bhutan, Samoa, Solomon Islands, Timor-Leste and Vanuatu). The survey is subject to some shortcomings because of its subjective nature (see Box 7.1).

Budget preparation and authorisation phases dealing with infrastructure investments could improve further. In budget preparation, broad strategic guidance ensures that the investments proposed by line ministries and executing agencies are chosen on the basis of development policy objectives (Dabla-Norris et al., 2011). However, half the countries in the sample had problems of co-ordination between line ministries and executing agencies preparing multi-annual investment plans in infrastructure and those ministries or agencies responsible for the budgetary process. For instance, in most cases, line ministries and executing agencies do not take into consideration available funds at the planning phase to select projects. Assessing low-income countries, the International Monetary Fund (IMF) and World Bank also find poor performance in project preparation (Allen and Last, 2007). In many countries, budget plans are based on improbable assumptions, are not comprehensive and lack medium-term focus. There is also room for improvement in project selection: in more than half the countries surveyed, the projects implemented are not those with the highest priority. In addition, line ministries and executing agencies do not consult systematically those ministries and agencies in charge of the budget process before committing the government to infrastructure expenditures. In turn, the state cannot always finance those projects.

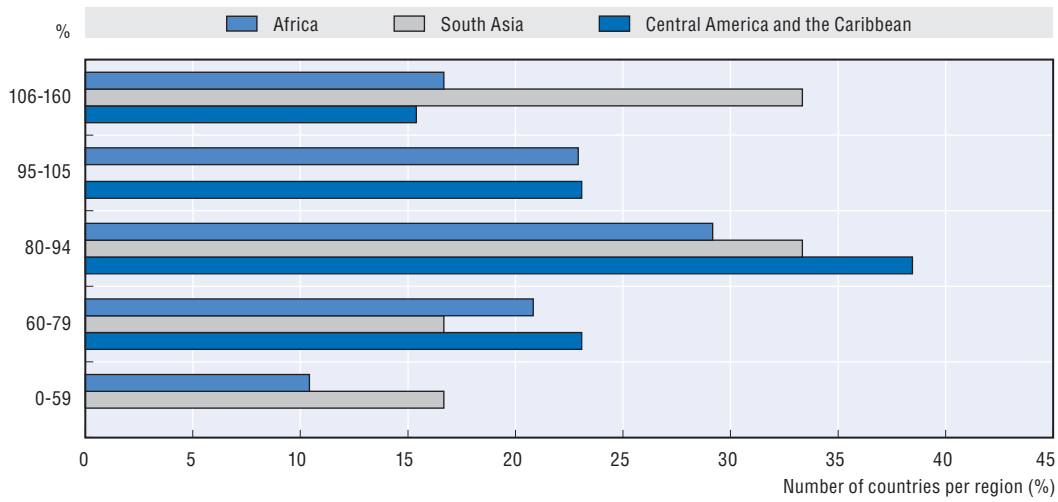
A better consistency of budget preparation/authorisation with development priorities could ensure higher outcomes (Dabla-Norris et al., 2011). In terms of the budget preparation, the government has to provide economy-wide and sectoral development priorities with detailed investment strategies that include costs. It could provide formal technical guidance widely available for budget preparation and project appraisal in infrastructure. A matrix of criteria for project appraisal can be very complex, with few projects meeting all technical, financial, economic, social, institutional, environmental and political requirements, which is why priorities need to be part of the process (CABRI, 2010a).

Moreover, independent peer reviews of whether or not line ministries and executing agencies apply these criteria to projects could be useful. At the budget authorisation phase, a review process through the legislature, with high levels of public disclosure, can help exclude poor quality projects. In addition, the medium-term framework needs to be consistent with fiscal aggregates. Multi-annual recurrent and investment expenditures in infrastructure could be financed within annual aggregate fiscal targets.

Poor execution of the national budget is a major constraint for capital expenditures in sectors such as infrastructure. Budgetary predictability in capital expenditure is particularly weak in Central America and the Caribbean, South Asia and Africa. The quality of budgetary execution reflects the extent to which actual expenditure matches intended expenditure: that is, the predictability of the budget. More than 30% of countries in Africa and South Asia and close to 25% of countries in Central America and the Caribbean execute less than 80% of their budgeted capital expenditure (Figure 7.1). For instance, Angola historically under-performs in budget execution, having spent only 34% of its budgeted capital expenditure in 2010. In Kiribati, a Pacific LDC, budget execution in 2009 was only 20%. This does not mean that infrastructure financing should not increase, but additional financing will fail to reduce infrastructure gaps unless budget execution rises. These results are consistent with IMF and World Bank assessments of low-income countries concerning particularly weak budget execution (Allen and Last, 2007).

Figure 7.1. **Rate of execution in capital expenditures by region**

Percentage of total budgeted expenditure



Note: Number of countries in the sample: 48 (Africa), 12 (South Asia), 13 (Central America and the Caribbean).
Source: OECD Development Centre based on national government and IMF estimates for 2010 or the last year available.

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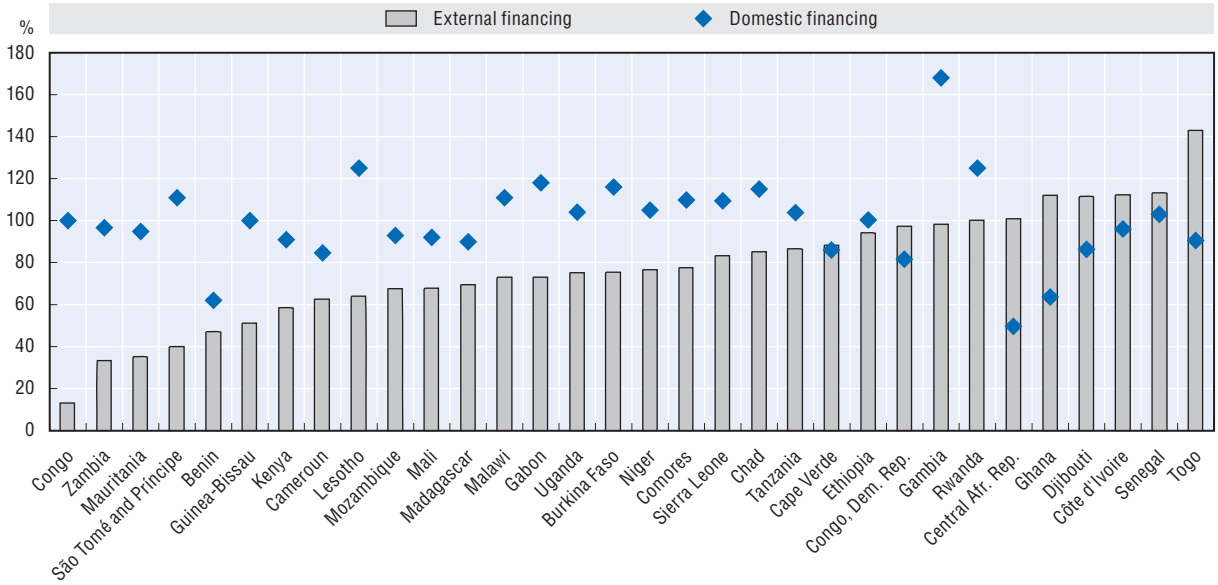
Budget execution in external financing is low. Problems of under-execution in investment budgets, because of weak project appraisal and poor management of broad and project-level risks, are exacerbated in the case of external financing (Dabla-Norris et al., 2011; Figure 7.2). In Mozambique, for instance, the external execution rate is 68%, compared to a domestic rate of 93%; in Kenya it is around 60%, against 90%. Low execution rates in external financing mainly relate to cumbersome procedures and slow disbursement.

Figure 7.2. **Rate of execution in capital expenditures in Africa**

Percentage of total expenditure, 2010 or last year available



Source: OECD Development Centre based on national government and IMF estimates.

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Although some challenges remain, emerging donors can bypass some execution bottlenecks with external financing. Since emerging partners in Africa generally offer project aid rather than programme aid (without policy conditionality), funds are channelled directly to the contracted firms, providing incentives to complete projects successfully and reducing the risk of fund misappropriation. For instance, two Chinese deals signed by Exim Bank in Angola specify that 70% of the civil engineering contracts have to be awarded to Chinese firms and at least 50% of the inputs have to be procured by China, a share actually higher in practice. However, these modes of financing come with challenges. In particular, fragmentation of aid remains a concern in the context of project aid. More transparency in financial deals and better regional co-ordination are crucial to prevent free-riding by some partners on others, to dissipate tensions with traditional partners, to enhance policy coherence consistently with the country's development strategy and to strengthen links between different infrastructure projects. In addition, by integrating a more accurate budgeting of maintenance costs in projects proposed by emerging partners, the effectiveness of these infrastructure projects should be improved (AfDB, OECD, UNDP and UNECA, 2011; Dahman-Saidi and Wolf, 2011; Mohan et al., 2010).

Tighter control in the government, harmonisation of aid procedures and better predictability of flows can help improve the execution of external financing. In terms of government controls, public expenditure tracking surveys (PETS) and internal audits can help identify persistent weaknesses in investment projects (Dabla-Norris et al., 2011). In contrast, introducing performance budgeting tools in an environment of poor budget execution is not likely to be effective (Allen and Last, 2007). In their *Paris Declaration* (OECD, 2005), external partners have committed to improving the quality and impact of aid, including by helping recipient countries integrate it better into national budgets. Aid capture by budgets is already approximately 80% (OECD, 2009). To ease fiscal management

in this context, donors could further simplify and unify procedures at country level, and make aid more predictable by providing timely, transparent and comprehensive information.

Financing infrastructure: Private-sector involvement

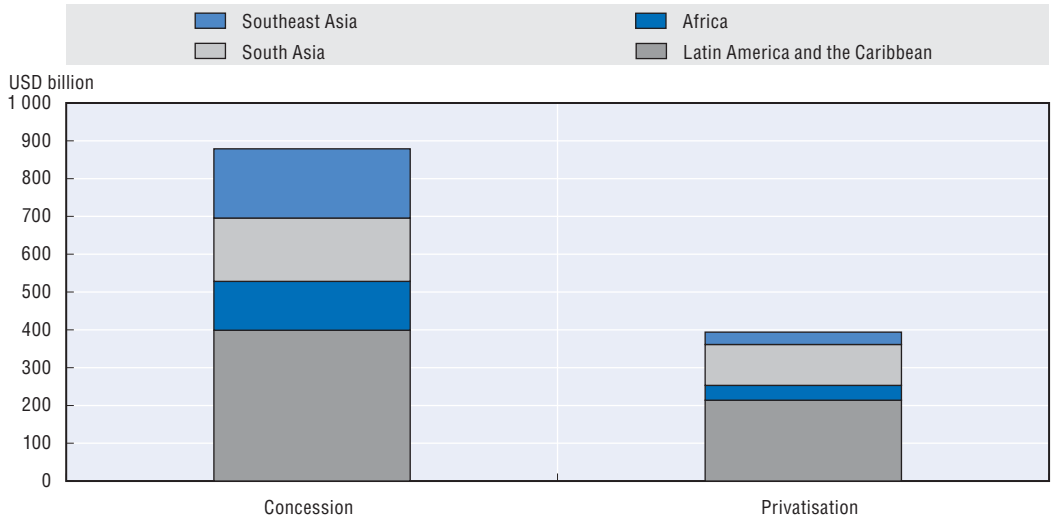
Private participation in infrastructure varies, depending on the level of risk transferred from the public to the private sector, the ownership of assets and the bundling of construction and operation (OECD, 2008; Engel et al., 2009). In public procurement, the government buys the infrastructure assets for a negotiated price and given quantity and quality, retaining operational and maintenance risks. In contrast, in the case of privatisation, the private entity buys an equity stake in the state-owned utility and receives the associated residual returns, thereby incurring a higher exposure to risk. Between these two extremes are public-private partnerships (PPPs) and concessions, where the government can buy infrastructure assets but also a stream of services for a negotiated price and given quantity and quality against a direct government transfer or user charges. The difference between concessions and PPPs is sometimes unclear, as much of the literature does not draw a precise line: the transfer of risk to the private sector is generally higher in concessions than in PPPs since the latter often rely on government financing. This chapter uses the terms PPPs and concessions interchangeably since its focus is on the enabling conditions for service provision, independently of the financing approach. The rationale for private-sector involvement in infrastructure is to improve value for money in public service delivery, share risk, introduce competitive pressures and bring in additional funds:

- Value for money entails that private participation should deliver an amount of public services at least equivalent in quality to what can be provided by the public sector alone, but at a lower cost (OECD, 2008). This benefit is often associated with the ability to anticipate large cost overruns, reduce administrative delays and improve standards.
- The sharing of risk enables the public and private sectors to bear the type of risks for which they are better suited. The public sector assumes those risks that are more difficult to control or anticipate, such as demand side risks (Égert et al., 2009).
- Tendering introduces an element of ex ante competition among private-sector participants.
- As a result of the trend in bank disintermediation since the 1980s, debt financing, a classic form of public utility financing, is becoming considerably more expensive than direct-equity finance (Mahboobi and Nestor, 1999). Through privatisation, public utilities can access equity markets.

Concessions are much more common than privatisations (Figure 7.3). They are often seen as alternatives to privatisation when for political or legal reasons the private sector cannot be responsible for operating state-owned assets (OECD, 2010a). In general, policy makers should select concessions when the most efficient approach for infrastructure service delivery involves periodic reassignment of contracts (fiscal and risk-bearing similar to public provision) and bundled provision of construction and operation (incentives similar to privatisation).

Concessions cannot be employed as a means of decreasing the need for public spending to finance infrastructure, nor can their use be justified by the claim that they increase fiscal space. The initial savings for government under a concession are offset, in

Figure 7.3. **Infrastructure investment with private participation, 1990-2010**



Note: Concession includes both concessions and greenfield projects as defined by the World Bank's Private Participation in Infrastructure database. According to the World Bank definition, greenfield projects handle new investments as well as operations and maintenance and asset ownership can be public or private during the contract length. Concessions handle operations and maintenance and asset ownership remains under the public sector during the length of the contract.

Source: OECD Development Centre based on World Bank (2012), *World Bank Private Participation in Infrastructure Project Database (1990-2010)*, *http://ppi.worldbank.org/*.

StatLink http://dx.doi.org/10.1787/888932814105

present value, by the amounts it surrenders in the user fees it could have collected under public provision.[8] Moreover, policy makers should not use concessions to disguise pressure on public finances. Recording investments in concessions off-budget is risky for fiscal sustainability and can lead to credit rating downgrades (OECD, 2012b). The potential contribution of private-sector financing across infrastructure sectors tends to be overestimated: even in countries with well developed frameworks for concessions, such as India, policy makers do not expect these arrangements to cover more than 50% of financing needs between 2013 and 2018 (UNESCAP, 2012).

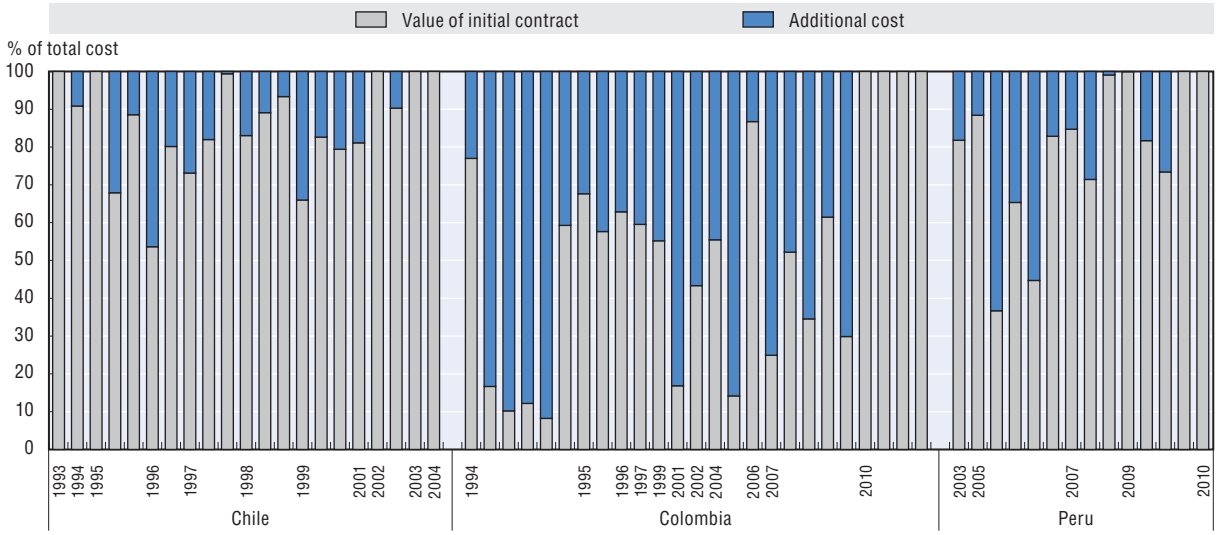
Concessions in the transport sector in Latin America

Latin America's experience of concessions in the transport sector reveals numerous, costly renegotiations. Governments have applied the model of concessions to the development of airports, roads, railways, seaports and multimodal terminals, first in the late 1980s/early 1990s in Argentina, Chile and Mexico, and later in Brazil, Colombia, Peru and countries in Central America and the Caribbean. However, difficulties encountered in the execution of concession contracts have led some policy makers to question the model. In the 1990s, close to 50% of transport concessions were renegotiated in Argentina, Brazil, Chile, Colombia and Mexico. In Chile, each concession was renegotiated four times on average between 1993 and 2007. Nearly a quarter of investment in concessions derived from renegotiations.[9]

Today, 40% of existent road concession contracts have been renegotiated in Latin America, according to policy makers (OECD/ECLAC, 2011). Fifty out of the 60 road concessions in Chile, Colombia and Peru were renegotiated up to 2010 (Bitran et al., 2013). The additional fiscal costs amount to 50% of the initial value of the contracts (Figure 7.4).

In particular, around 35% of the 541 contract changes made to road concessions in these three countries added complementary investments that were not envisioned in the initial contracts. In total, 41 of the 60 road concession contracts were modified at least once to include additional works. In 12 of these concessions, extra lengths of road were attached to the contract. In the case of Colombia, 21 concessions were renegotiated 273 times, at an additional fiscal cost worth 170% of the initial value of the contracts, and concession periods extended by 40% on average. Policy makers point out that both regulatory factors – e.g. price caps and tendering processes – and political aspects – quality of bureaucracy, election cycles, little independence of regulators – have affected effectiveness.

Figure 7.4. **Renegotiation of concession contracts in Chile, Colombia and Peru**



Note: The x-axis indicates the year in which the concession contract was initially signed. Years are only mentioned for the first concession signed.

Source: Bitran, E., S. Nieto-Parra and J. S. Robledo (2013), "Opening the Black Box of Contract Renegotiations: An Analysis of Road Concessions in Chile, Colombia and Peru", *OECD Development Centre Working Paper,* No. 317, OECD, Paris.

StatLink http://dx.doi.org/10.1787/888932814124

The possibility of renegotiation encourages opportunistic behaviour by both contract winners and government. Renegotiation can be a consequence of the incomplete nature of concession contracts: policy makers do not know in advance of all the variables affecting its terms. Over time, the parties may have to adjust them. Renegotiation can also be caused by the opportunistic behaviour of any of the parties:

- Concessionaire-led renegotiations (Guasch *et al,* 2003; Araújo and Sutherland, 2010): a bidder may make a generous offer at the competitive award stage, expecting to cover these losses through renegotiation (OECD, 2007b). After the award of the contract, the bargaining power may shift substantially in favour of the concessionaire, who may, for instance, threaten the government with service interruption. In Latin America, faced with weak contract management, road concessionaires offered tendering prices below what they would offer in the absence of renegotiations, and matched or improved the initially expected revenues during the renegotiation (OECD/ECLAC, 2011).
- Government-led renegotiations (Guasch et al., 2007; Araújo and Sutherland, 2010): often, concession investments involve large sunk costs not easily recouped in the event that the operator discontinues operations. Evidence in Latin America shows that governments

are tempted to behave opportunistically and take *ex post* regulatory actions to expropriate the rents of the firm (Guasch et al., 2007). The analysis of concessions in Chile, Colombia and Peru suggests that both the administration and the concessionaire are expecting renegotiation at the time of the signature of the initial contract (Bitran et al., 2013). Renegotiations came by mutual agreement in 83%, 98% and 100% of the cases in Chile, Colombia and Peru respectively. In all cases, the first renegotiation was carried out in the first two years after the start of the contract.

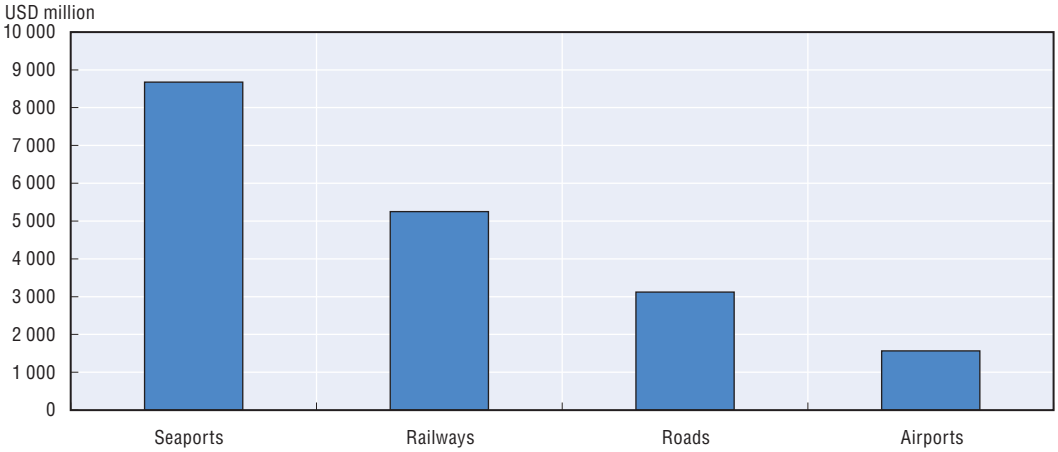
Concessions should be chosen based on an evaluation of value for money. Cost-benefit analyses essentially aim to work out which infrastructure projects offer the best value for money (OECD/International Transport Forum, 2011), which in turn helps determine which mode of financing is most appropriate. Following a social feasibility analysis, policy makers can use value for money evaluations to assess whether or not a concession model is preferable to direct public sector provision. While most OECD economies do a cost-benefit analysis or use a public-sector comparator, Latin American countries usually limit their analysis to a comparison of tendering results. This creates uncertainty as to whether the private sector can generate value for money. Furthermore, it is crucial to ensure that authorities do not heavily discount future payments of concessions or favour concessions over public procurement with the main objective of meeting short and medium-term fiscal targets.[10] However, only in nine OECD countries were concessions accounted for as contingent liabilities in government accounts in late 2007 or early 2008 (Araújo and Sutherland, 2010). A change in fiscal accounting can improve concession selection, avoiding reckless investments and the transfer of fiscal commitments to the future. Given that the state controls the economic results of the concession through regulations and is also the recipient of the work at the end of the contract, considering concessions as public projects can increase the transparency of public accounts. The OECD 2012 Council Recommendation on PPPs provides guidelines as to when concessions are worth pursuing and addresses their budgetary consequences (OECD, 2012d).

Concessions in the transport sector in Africa

Transport concessions are few in Africa, particularly for airports and roads. Following structural adjustment programmes in the 1990s, governments started to apply the model of concessions in the transport sector in the 2000s. These concessions were mostly directed to the development of seaports and railways. The experience of commercial banks in raising finance suggests a hierarchy of difficulties: in descending order, the easiest to fund are seaports, railways for freight, roads and airports (AfDB/OECD, 2006; Figure 7.5). For instance, less risky investments in seaports and railways receive almost three times more private investment than roads and airports. In any case, private participation through concessions remains low across all transportation modes. Private operators have been reluctant to invest even during the concession boom, which led to a predominance of management and lease contracts (Afeikhena, 2008).

Geography, demography and a lack of resources are major impediments to overall transport development in Africa. Sixteen of the continent's 54 countries are landlocked, and population densities and the level of development inland are very low (AfDB/OECD, 2006). Most countries have difficulties in accessing finance because of their low creditworthiness and the limits of local financial markets (von Klaudy et al., 2006). As a result, levels of private investment remain low. The upgrading and extension of networks have been largely funded by bilateral and multilateral loans on concessional terms.

Figure 7.5. **Transport concessions with private participation in Africa, 1990-2010**



Source: OECD Development Centre based on World Bank (2012), *World Bank Private Participation in Infrastructure Project Database (1990-2010)*, *http://ppi.worldbank.org/*.

StatLink http://dx.doi.org/10.1787/888932814143

Abrupt reforms and mismatches between legal systems and regulatory instruments also explain the low prevalence of concessions in Africa (Estache, 2008). Institutional reforms in the 1990s aimed at opening up transport sectors to private participation were implemented too quickly: governments were not able to build the necessary institutional capacity, and sectoral outcomes fell short of objectives. For instance, lawyers in Francophone Africa – where *affermage* contracts were commonly used – were not familiar with concession contracts.[11] Concessions relying on fuel levies for road maintenance stumbled following problems of poor revenue management and inability to control evasion, and road funds captured only about 50% of the planned resources (World Bank, 2009). Besides, little has been done to determine the cost of hybrid solutions combining legal systems, contract forms and regulatory processes or instruments from various legal traditions. Francophone countries often reacted negatively to the imposition of independent regulators, as it did not fit into their legal tradition. These risks have been significantly less well studied than drivers of renegotiations in concession contracts in Latin America.

Governments must ensure that concessions are sustainable and balance the sharing of risks and responsibilities between public and private sectors (Biau et al., 2008). Road funds and agencies must be independent of both public and private influence in order to increase accountability and efficiency. They could be financially separated from the general government budget in order to ring-fence money for maintenance. In addition, road funds and agencies should operate on the basis of concrete performance objectives. Moreover, the state may establish governance structures between public and private actors whereby risks are assigned to the partner better able to manage them. With the aim of effectively sharing risks, multilateral bodies such as the African Development Bank (AfDB), the Multilateral Investment Guarantee Agency (MIGA) and the World Bank are developing new mitigation instruments. These instruments encompass not only political risk (currency non-convertibility, expropriation, and civil disturbance), but also commercial risk (breach of contract by the host government, risks of public non-payment), regulatory risk (arising from adverse regulatory actions taken by the host government) and sub-sovereign risk (loss due to non-performance by the sub-national host governments).

Conclusion

Infrastructure is a major bottleneck for the competitiveness of developing countries. Most of them need not only to substantially increase their investment in infrastructure, but also to improve the prioritisation of investment and management of projects. The prioritisation, planning and execution phases need to be strengthened in order to increase the impact on development.

While the prioritisation and planning is the most challenging phase for emerging economies, LDCs have most of their difficulties at the execution phase. According to a survey of policy-makers, in 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. LDCs identified the execution phase as the most complex in the policy-making process, alone or together with other phases. Large projects often encounter costs and time overruns during the construction process. Overcoming infrastructure gaps in emerging and developing economies requires improving horizontal and vertical co-ordination. Investing in infrastructure often involves different levels of administration, such as central, regional and local governments, and requires alignment between several line ministries. For example, improving transport infrastructure requires taking into account the needs of the private sector in terms of domestic and foreign connectivity. For this reason ensuring co-ordination between different ministries is decisive in designing and implementing better policies.

The mechanisms for financing infrastructure should also be improved. Policy makers need to strengthen the preparation and authorisation phases of the national budget. Low execution rates of externally financed capital expenditure in national budgets must be enhanced. Improving infrastructure in developing countries will require reinforcing public-private partnerships and increasing private-sector participation in infrastructure projects. In terms of sequencing, some reforms must be undertaken prior to promoting private participation, e.g. restructuring the infrastructure, setting up a regulatory framework supported by an independent institution, and introducing competition whenever possible. In particular, this will need better institutional capabilities at the government level, tailored reforms in the fields of regulations and contracts (contract design, regulatory processes and instruments) and improved trust between the private and public sectors. Governments should ensure that they do not call on the private sector to involve itself in infrastructure only to give themselves greater fiscal space.

Notes

1. See Straub (2008) and Agénor and Moreno-Dodson (2006). For instance, in the 19th century railways and the telegraph made it possible to improve the speed, volume and regularity of the distribution of goods and information. Markets grew and new organisational practices emerged with better inventory management, more efficient market clearing, enhanced competition, faster diffusion of technology and changes in the pattern of specialisation. Overall, there is a reorganisation of production thanks to lower transaction and co-ordination costs.
2. Co-ordination stands out as a key challenge in public policy in infrastructure as the socio-economic development of the country improves. Characteristics of the policy-making process such as adaptability and effectiveness are more problematic in African and Asian LDCs, respectively.

3. Data for Mexico are missing.
4. In South Africa, for example, as capital budgets increase over the years, the weaknesses of provincial departments to plan and manage significantly larger capital programmes have become more pronounced because of a general lack of skills in project planning and management.
5. See Charbit (2011) for examples of indicators used by different OECD countries to measure sub-national service delivery.
6. Smith (1776) and Samuelson (1954) had already outlined the limits of markets in providing collective goods. Market failure is a concept whereby the allocation of goods and services by a free market is not efficient. If private markets do not reap all the benefits of a good they have produced, their incentives to produce it might be insufficient. This inhibits the development of the market whereby desirable transactions cannot take place. See Atkinson and Stiglitz (1980) for an overview of the rationale for public investment in infrastructure.
7. There is a large stream of literature on the role of budgetary institutions to reduce the principal-agent and common pool problems in fiscal performance (see Hagen (2002) for Europe countries, Santiso (2004) for Latin American countries and Gollwitzer (2011) for African countries).
8. Engel et al. (2009) argue that once the inter-temporal government budget is considered, the case in favour of public-private partnerships or concessions based on the relaxation of the governments' budget constraints is weak.
9. Guasch et al. (2008) for Latin America and Engel et al. (2009) for Chile.
10. See Donaghue (2002) and Engel et al. (2009) for a detailed discussion on the subject. For example, in the United Kingdom aspects of "property" as well as "risk transfer to the private sector" are considered when determining whether a project must be incorporated in the public balance sheet, while in New South Wales in Australia it was determined that the assets and liabilities of privately financed bulk-water treatment plants must belong to the public-sector balance sheet (Irwin, 2007).
11. Affermage contracts are legally binding agreements where the public sector contracts out to the private sector operation and maintenance but without investment obligations (Dassiou and Stern, 2009).

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Chapter 8

The political economy of industrial policies

Not only is a strategic and integrated framework important for the effectiveness of industrial policies but so, too, are the political willingness and institutional arrangements that will govern the design and implementation of these policies. This chapter looks into the political economy of industrial policies. Their success will depend on the capacity of governments to open political spaces for dialogue with essential stakeholders such as the private sector. It will also require building institutional capabilities and ensuring co-ordination between the different institutional players involved in the design and implementation of these policies. Critical elements of the design of a credible industrial development plan include the need to secure stable sources of funding, to define clear mandates and a governance scheme that foster smooth co-ordination and effective execution, and to invest in the training of management and professional staff.

Introduction

Industrial policies are back on the policy agenda of a number of developing countries after decades when they were out of favour. The current global economic environment offers an opportunity to build coherent policy frameworks and solid institutions which respond to the challenges of the 21st century and avoid the mistakes of the past. Yet those responsible for making and implementing policy face various political and institutional challenges, requiring not only political skills but also the capacity to design and build institutional arrangements to engage with all the actors involved in the process of production development.

Developing countries have adopted diverse industrial policy strategies over the last 30 years. While East and Southeast Asian countries put in place active policies and stable institutions, in Latin America and Africa policies were substantially weakened by the implementation of the doctrines of the Washington Consensus, with a few exceptions such as Brazil. In recent years industrial policies have been gradually reintroduced in Latin America and Africa, with innovations in specific fields, as documented in previous chapters. Yet these policies have not always been integrated into national strategies and supported by stable institutional structures.

Politics are important if industrial policy is to be successful. Experiences in many countries, both members and non-members of OECD, show that industrial policy can work, but may also fail, depending on the political and institutional environment (Khan, 2012). The challenge for the promoters of industrial policy is twofold. They need to open political space to implement industrial policies, as supported by strong theoretical arguments and historical evidence. Yet in this endeavour they should put in place mechanisms and safeguards to prevent the risk of the political pressure and capture that contributed to the failure and discrediting of industrial policies in many developing countries (Killick, 1978). Looking at global best practices in this case can provide useful examples. Experiences such as the East Asian miracle illustrate "how the economic bureaucracy was allowed to develop rational economic policies without having to adopt politically motivated projects or instruments" (Robinson, 2009).

The effectiveness of industrial policies does not depend only on proper design and integration into a broader national strategic framework. Political commitment and institutional arrangements are essential elements and have been fundamental to the success of experiences in Asian countries, such as Korea and Singapore, and European countries, such as Ireland or Finland, that were able to overcome the "middle-income trap" after 1960. These cases demonstrate the importance of the "what to do" as much as the "how to do it" (Devlin and Moguillansky, 2011).

Consequently, policy makers of developing countries who are reinforcing their industrial policies need to answer a series of questions. How to create the political space needed to implement industrial policies, the benefits of which will often only become evident in the long term? How to involve the private sector in the formulation of national

strategy without being captured by interest groups? How to open space for new economic activities that have no or little political representation? How to implement strategies that require the commitment of several public organisations with diverse – and sometimes divergent – priorities and mandates? And what capabilities are necessary for those organisations responsible for industrial policy design and implementation to guarantee the effectiveness and long-term consistency of their actions?

Opening political space for industrial policies

Building legitimacy for long-term oriented policies: the role of political leadership

The establishment of productive development policies, to be successful, requires a high degree of legitimacy among the public and a high priority on the government agenda. The main reason is that such policies change the *status quo* in the production system, and require the alignment of the actions of many actors, private and public, as well as long-term commitment. The pressure exerted on governments to prioritise short-term results, the political opposition of groups whose interests are affected, or bureaucratic inertia can hamper the emergence of favourable political conditions for these policy initiatives. Strong political support is therefore essential in overcoming the many obstacles on the way to putting into effect industrial policy. Complacency about current economic performance and ignoring troubling medium-term and long-term trends can also hamper the deployment of industrial policies.

In successful applications of industrial policies, productive transformation has been presented by national leaders as essential to the future welfare of the country. The implementation of an industrial policy that seeks to change the productive structure in the medium and long terms of the country faces political difficulties similar to those arising from long-term reforms in other fields (OECD, 2010). Where the public fails to perceive the long-term benefits of the reforms, these policies tend to be relegated to secondary positions on the national priority agenda. The policy making process, resulting from interactions between several agents, can result in a disorganised process in which the long-term benefits of the reforms are difficult to achieve (see Dayton-Johnson et al., 2011 for the case of Latin America). Conversely, and interestingly, in critical times of their history, leaders of countries such as Finland, Ireland and Korea were able to set long-term production development as essential in addressing national challenges, and afterwards, based on the results of these policies, to sustain their deployment over time. Linking industrial policies to broader challenges, such as overcoming a historical burden of socio-economic backwardness as in the case of Ireland, or responding to geopolitical threats as in the cases of Korea and Finland, probably played a role in winning public support.

There are various ways of putting industrial policies on the agenda of national priorities; obtaining a clear electoral mandate is top of the list. The demand for industrial policies commonly emerges from dissatisfaction with certain features of the development process, such as low growth, low diversification of production, and changes in the production structure in directions which are seen to be less socially just or likely to leave the country more vulnerable to external shocks. The level of public awareness sometimes grows gradually, or rises rapidly at critical junctures, such as a drastic fall in export prices, changes in the exchange rate, or the unexpected emergence of social demands linked to troubled sectors or regions, which can open windows of opportunity for the implementation of specific policies. However, the consolidation of support for more

ambitious transformation processes requires, in most cases, a clear mandate from the voters for explicit programme proposals. In this spirit, many countries, such as Brazil, Malaysia, Morocco and South Africa, have adopted clear strategies for the productive transformation of their economy, namely the *Plano Brasil Maior*, the South African Industrial Policy Action Plan 2012-15, the Malaysian Economic Transformation Programme for 2020 and the Moroccan National Pact for Industrial Development 2009-15.

Most industrial policy initiatives require a stable institutional framework. This needs permanent mechanisms and agreements to ensure that efforts will be sustained beyond the term of a government. Structural transformation is a permanent, cumulative process in which the consolidation of new sectors may take decades. Initiatives based only on circumstantial political arrangements tend to be very fragile. By contrast, long-lasting initiatives are generally based on a combination of factors such as a broad social legitimacy of the effort, strong partnerships among relevant social and political actors, stable and technically sound public organisations, and mechanisms to ensure a stable financing effort.

The need for public-private alliances

Public-private alliances are critical in the design and implementation of industrial policies in existing global conditions. At present in most developing countries private companies are the main actors of the process of structural transformation. They make decisions on investment and innovation on the basis of their perception of market opportunities. They are also best placed to detect the obstacles and bottlenecks that limit the possibility of taking advantage of these opportunities. For this reason, unlike after World War II when the existence of public enterprises was pervasive, the design and implementation of industrial policies and strategies demand a close collaboration between the government and private enterprises. But this relationship entails the risk that the government may be captured by private interests, a danger which should be minimised by the establishment of interaction mechanisms subject to public control.

Public-private alliances play an important role all along the process of crafting strategies. They make it easier to implement specific industrial policies and to monitor and evaluate their impact. A fluid interaction between the public and private sectors serves many purposes. Building shared visions makes it easier to construct viable scenarios that make investment in complementary assets, public and private, socially profitable. In the design phase, private companies can provide valuable information about the feasibility of specific initiatives and the conditions for the increased effectiveness of policies. In the implementation phase, the feedback provided by companies, especially pioneer firms in new sectors, is crucial for the fine-tuning of policies and instruments. Dialogue with the private sector should be an integral part of the monitoring and evaluation phase to help identify the critical factors of success of policy action.

Public-private collaboration should be guided by the pursuit of the common good of the society and not of the particular interests of a few. The involvement of private companies in the definition of strategies and policies presents advantages but also risks. In particular, some interest groups may try to shape policies for their own benefit and to the detriment of that of others, or simply propose measures beneficial to themselves but with no significant externalities for the country's productive transformation. Policy makers have an active role to play here, not only in bringing forward proposals transcending the interests of participating companies, (e.g. the promotion of new sectors with high potential

impact) but also by ensuring that the proposals of the private counterparts do not produce undesirable effects on competition or the welfare of citizens. A bureaucracy that possesses integrity and autonomy but simultaneously remains close to the private sector is crucial for successful dialogue (Pinaud, 2007).

The guiding principles for the management of public-private alliances should be those of broad participation, transparency and accountability. To work effectively, public-private partnerships must be legitimised by the public as arrangements contributing to the common good. In practice this translates into the participation of many different actors, and not only of representatives of the business community. Academia, educational and research organisations, representatives of labour organisations and regional authorities should also be involved, allowing for the balancing of influences and a wider representation of interests. Often the dialogue is supplemented by public consultation processes on specific topics. In this field it is important that the discussion and results be reported in a transparent manner to the public. Public initiatives arising from public-private discussions should be subject to basic standards of accountability.

Effective public-private alliances are based on a mutual trust built through recurrent and mutually beneficial interactions. Only the existence of a high level of mutual trust between parties can lay the foundations for more ambitious national endeavours, the hallmark of successful industrial policy efforts.

Opening political room for the emergence of "the new"

Opening space for the emergence of new economic activities is critical to building productive development policies. The transition from one development stage to another can be hampered by interest groups, such as companies and institutions (public and private) with prominent positions in the existing industrial configuration, which fear losing their privileged position. In the context of development economics, several authors have modelled the process of economic development as one in which economies transit through different stages (Lin, 2011; WEF, 2002). An economy at a given developmental stage is characterised by a certain number of sectors in the process of expanding and a set of associated institutions (educational and research institutions, public agencies, organisations, etc.). Market forces can help expand these sectors up to a certain point at which diminishing returns or the emergence of new competitors trigger a gradual decline in growth rates and job creation. Sector expansion is associated with the emergence of interest groups in various spheres (business, labour, public services, political circles) whose welfare depends on the health of the leading sectors of an economy in a given stage of development. A common view develops in society about the way the economy works which legitimises existing economic relationships and priorities but limits perception of new paths of development. But when the phase of decreasing returns arrives, it is likely that these communities will try to maintain the *status quo*, not being able to see new sources of growth. This may also result in active or passive resistance to policy initiatives that seek to open pathways to new productive activities.

Industrial policy can be a mechanism to fight capture. The usual criticism of industrial policy is that those sectors or companies that enjoy high levels of protection tend to capture the government to avoid the removal of those benefits. That also applies to some extent to a situation in which incumbents enjoy a suitable institutional environment and oppose any industrial policy that aims to extend favourable conditions to the emerging sectors. Industrial policy in this case can be seen as a mechanism to fight capture. But the

promotion of some new activities, whose sustainability in a context of market competition has not necessarily been tested, involves significant risks and the process in which this is decided must enjoy a high level of public legitimacy.

The key role of building strategies

The construction of strategies is the most important process in the field of industrial policy. It contributes substantively not only to defining the content of these policies, but it also lays the foundations of an effective implementation. Strategies based on sound diagnostic processes and formulated through procedures that involve an active participation by the private sector and other key stakeholders make it simpler to establish the necessary political legitimacy for policy measures. They also focus efforts on initiatives whose contribution to the development objectives have been properly tested and are an essential tool for aligning the actions of public bodies responsible for implementing the suggested measures. Well-developed strategies are a motivational tool that national leaders can use to mobilise a country's energies behind shared goals.

Building national strategies for productive development has been an important ingredient of the experiences of catching up in the last 50 years of countries around the world (Devlin and Moguillansky, 2011; OECD, 2005). As a result, a growing number of developing countries have adopted the practice in recent years. Establishing regularly updated national economic plans has been, and still is, a common practice in Asia: the national economic plans of the Ministry of International Trade and Industry (MITI) of Japan formulated and updated since 1946, the South Korean Five-year and then Ten-year national development plans starting from 1962 and the 12 Five-year plans of China starting from 1953, to name only a few. Similarly, Finland and Ireland have institutions responsible for designing and regularly updating their strategies for productive development and innovation. More recently several Latin American countries, including Brazil, Chile and Colombia, have formulated strategies for productive development and innovation.

Although national strategies can take diverse forms, they present common features. The first is a certain vision of a desirable future for the country and its economy, linking productive development with broader national objectives. The second is a diagnosis of the conditions in which the country and its business sector will operate in the medium and long terms and an assessment of the country´s critical capabilities. The third is a definition of specific lines of action to build general capabilities and/or to expand specific sectors or clusters. The analysis horizon is usually medium-term to long-term, sometimes exceeding ten years. In many countries, particularly in Asia, the strategies are subject to regular updates, usually every five years.

A production development strategy should be aimed at making it easier to transform the productive structure of the country. That should be done through both the expansion of sectors of high competitiveness and the emergence of new productive activities. In pursuit of these objectives, the strategy has to identify the main constraints that limit the process of transformation, which include inadequate access to skilled personnel; lack of financing; technological hurdles; infrastructural weaknesses; and legal restrictions. Then it has to identify the policy interventions that will help remove these constraints. The result is a combination of horizontal, sectoral and regional policy interventions, under the responsibility of different bodies. In this sense, a strategy integrates the efforts of different

government agencies around shared objectives, which is the basis of the necessary alignment in the implementation phase.

As important as the final document that describes the strategy are the effects of the process of strategy formulation. Building a strategy involves a political process that seeks to mobilise action towards shared purposes. It is not only a rational analytical process, but one of engagement of the relevant actors, public and private, in a common endeavour. Aspects such as the adequate selection of participants in the process corresponding to the aims of representativeness, leadership and relevance are of crucial importance. The establishment of an environment of openness and transparency through broad consultation mechanisms expands the legitimacy of the exercise. A major effort of dissemination is also necessary. Finally, the formalisation of these dialogue spaces ensures continuity in time and increases the level of commitment of the actors and creates a sense of co-ownership that makes it easier to implement the initiatives. Examples of formal structured mechanisms for consultation and advice to the executive which involve broad civil society participation include the Economic and Social Development Council (CDES) of Brazil, the National Accord in Peru or the National Planning Council in Colombia.

Effective implementation: the need for adequate institutional capabilities and co-ordination

Public agenda alignment

Modern industrial policy demands an intense effort of horizontal co-ordination (whole-of-government approach) to reconcile sometimes conflicting interests among public institutions. Ministries and agencies, with separate mandates not always precisely focused on the objective of long-term competitiveness, might not deploy the necessary effort to achieve this aim. It is necessary to build institutional arrangements that facilitate government alignment around these priorities (OECD, 2005).

Co-ordination failures that obstruct the deepening of competitive capacities of a country occur in several areas. They do not only include the interaction between companies, educational institutions or technological centres; they are also frequent between public agencies that manage the policies that impact on those bodies. Unlike the traditional pattern of turf conflicts, the most common problem in implementing modern productive development policy emerges when the bodies that have traditionally played roles in a particular policy sphere are requested to perform new or additional roles, or modify the objectives that have historically guided their activities. The natural reaction is to reject the new requirements or not to put enough effort into carrying them out, arguing, often with good reasons, that they divert efforts from objectives that are central to the body in question. This happens for instance when a ministry of education or labour is asked to implement specific projects to satisfy the requirements of industry, or when science and technology policies are called upon to reorient the allocation of resources to productive development objectives. There are many other sources of a lack of public co-ordination arising from overlapping attributions, e.g. in the interaction between sectoral and functional authorities, for instance ministries of industry and innovation, or between national and regional authorities.

A well designed and communicated strategy is the main device for aligning government efforts. As the business strategy literature establishes, one crucial role of a strategy is to align the work of different divisions in a multidivisional organisation (Kaplan

and Norton, 2006). On the one hand, an adequate inclusion of the divisions involved in the strategy deliberation is crucial, in order to consider their particular circumstances and also to engage them with the general objectives. On the other, the communication of the strategy to the different divisions is also crucial, especially to clarify how the specific effort of each unit contributes to the overall result. Finally, the active participation of the divisions in the strategy-building phase also makes it easier to negotiate priorities and identify the need for additional resources. These principles are entirely applicable to government. The process of strategy building should include a consultation with all the concerned agencies and the implementation requires a thorough communication process to their staff and their implication in this effort. Particularly important is the communication by the country's highest political authority of its clear commitment to the strategy.

The establishment of co-ordination and monitoring bodies, led by the highest authorities, to sustain momentum also helps in the resolution of conflicts that emerge in the implementation of policies. The implementation of productive development strategies is usually supervised by dedicated councils of ministers and very often chaired by the prime minister or the president. The role of these bodies is typically to monitor the progress of the different initiatives, to identify obstacles that emerge in their implementation and to resolve conflicts among the different bodies involved in them. The need for the regular participation of the highest authority of the country signals the strategic relevance of the effort and makes easier the co-ordination between ministries, when there is no other level of authority between them and the highest authority. For example, in Colombia, it is the High Council of the Presidency and the Department of Planning that head the co-ordination of the execution of the strategy (Devlin and Moguillansky, 2012).

Securing stable financing

A stable allocation of public funds is needed for the implementation of industrial policies. The aim of transforming the productive structure of a country usually demands the commitment of effort over a long time, with the corresponding need for funding. Securing stable financing is essential and abrupt interruptions can result in delays and even in the waste of significant investments, particularly when they have been made in intangible goods that are subject to rapid depreciation, for example research and development (R&D), training, etc. The establishment of well financed long-term programmes to sustain access to credit or venture capital, R&D programmes or public infrastructure encourages private investment by companies or individuals that strengthen the chances the policies will succeed.

To guarantee predictable funding of long-term programmes countries need a wide variety of mechanisms. The first option is, naturally, to finance these initiatives through specific items in the national budget, subject to annual approval, but that does not always guarantee stability and accordingly other arrangements have been established. In cases where the public sector has to finance permanent services to strengthen the competitiveness of firms, government can apply specific taxes to the firms that receive those services. This happens in the case of SEBRAE, the Brazilian service providing technical support to small and medium-sized enterprises (SMEs), which is financed through a monthly contribution of 0.3% of the payroll of companies. In other cases the idea is to reallocate resources from traditional sectors or channel the rents of natural resources

to innovative activities. Such an approach is exemplified by the introduction in 2005 of a specific mining tax in Chile to increase the resources available to implement its innovation strategy. Similarly, in Colombia the recently reformed royalty scheme allocates 10% of the total amount of royalties from the commodity sector to the Science, Technology and Innovation Fund which aims to boost productivity in the non-commodity sectors (OECD, 2013). The stability of the funding can be reinforced by the establishment of special purpose funds, allocated in a counter-cyclical manner.

Rebuilding capacities in countries where industrial policy institutions were dismantled

Developing countries must strengthen the responsible institutions in areas such as mandates, governance and skilled staff. The experience of countries that have successfully implemented productive development strategies shows that specialised institutions with clear mandates, professional management and specialised staff are essential in providing critical insight into the process of strategy building and in implementing different policy initiatives effectively and honestly. Experiences such as those of MITI in Japan, the multiple agencies that provide credit or promote innovation in Korea, the combined roles in Ireland of Forfas (planning), Enterprise Ireland (domestic enterprise development) and the Irish Development Agency (IDA: foreign investment attraction) are good examples of this in cases of countries that have closed the income gap with developed countries in recent decades. In many developing countries these kinds of institution either do not exist or have been significantly weakened as the result of the Washington Consensus policy orientations; and so the task of strengthening a well-balanced and well-endowed set of public institutions responsible for productive development policies is a priority.

The particular configuration of the public institutions concerned with productive development varies. It depends on the stage of development of the country and its patterns of industrial specialisation. Productive development policy involves the performance of several functions such as providing technical and logistic support to the process of strategy building; co-ordination and monitoring; management of specific programmes in fields such as promoting innovation and technological upgrading; access to finance; and training and building skills. Depending on the country, these functions can either be the sole responsibility of one institution or allocated to different institutions. In defining the allocation of responsibilities, governments need to pay particular attention to the following critical elements:

- A ***mandate,*** clearly oriented to promote competitiveness and productive development, establishes a long-term perspective and protects the organisation against pressures to perform functions in different policy areas. It is particularly important to differentiate the functions of productive development on the one hand and social and short-term employment policies on the other. The establishment of legal mandates that specify the scope of action of specific organisations is to be welcomed.
- A ***governance*** scheme encourages the implementation of the productive development policy strategy and, at the same time, promotes an effective execution of the programmes allocated to the particular agency, according to technical principles, and protects it against distorting external pressures. The establishment of governing boards with mandates that transcend electoral periods and that have a balanced presence of representatives of different political currents and key stakeholders (business or university representatives), can help towards this aim.

- ***Qualified management and professional staff*** are essential in designing and implementing programmes that require technical judgment and up-to-date knowledge about market and technology trends. Running agencies responsible for carrying out policies for productive development (including development banks, skills development agencies or innovation promotion institutions) involves amassing very specific and non-codified knowledge, which is not easily available in the private sector or in academia. Consequently, the recruitment and, more particularly, the retention of highly qualified staff are crucial for the success of these agencies and demand approaches to human resources that balance adequately pay policies and other incentives. The existence of professional civil services in some countries makes it easier to build a strong personnel base in this type of agency. However the absence of those arrangements in many developing countries forces the design of *ad hoc* policies at the agency level (Devlin and Moguillansky, 2012).

The implementation of an adequate evaluation of industrial policies and their components requires new institutional capacities. The effectiveness of industrial policy in an evolving context depends not only on the quality of the strategy but also on the proper design of interventions and the ability to monitor its implementation and evaluation of results. For this purpose it is necessary to establish institutional mechanisms that, combining adequate knowledge of the subjects analysed and appropriate levels of independence, make possible judgments founded on the results of the various components of the policy in its various phases. On this basis policy can be improved by strengthening certain initiatives, and modifying (or even discontinuing) others.

Long-term stability and continuity of the institutions that implement industrial policies increase the probability that they will succeed. Structural transformation involves processes that can take many years and may span several short periods of individual governments. The presence of more permanent and professional organisations can guarantee the continuity of long-term efforts. But historical evidence shows that these institutions need to enjoy a strong reputation that combines technical capability, probity and lack of partisan bias. Consequently, a political objective of those countries that are re-establishing policies for production development must be to build solid institutions with long-term orientations, on the basis, it is to be hoped, of broad national consensus.

Conclusion

Shifting wealth from advanced to developing economies is a continuing process that will shape the nature of the global economy during the next decades. However, its scope, intensity and specific directions are far from certain. Governments from all over the world are challenged by the magnitude and speed of these significant changes and recognise that, in order to deal with them, markets alone are not sufficient.

Developing countries that aim to close the gap in living standards with OECD countries realise that the shifting wealth process involves risks but also significant opportunities. To fulfil these objectives their governments need to develop more proactive strategies and policies. They need to build greater capability to anticipate, plan, implement and adjust their policies. They have to develop institutions and mechanisms to co-ordinate action, with the private sector and inside government, and avoid lock-in; and they have to add more flexibility to their economies to respond to emerging challenges and opportunities.

Industrial policies built on the basis of shared strategies can make a distinctive contribution to these challenges. They demand a permanent effort to improve policies in fields such as innovation, skills formation, access to finance and infrastructure, in light of the emerging demands of international markets, and to take advantage of the opportunities opened up by rapid technological change. But they also require a permanent effort to improve the co-ordination of these and other policies around strategic objectives that emerge from a thorough analysis of the evolution of global trends.

A major effort of investment in government capabilities is necessary. The governments of developing countries need to strengthen their capacities to look constantly for opportunities and challenges. They have to develop and implement plans on the basis of a fluid interaction with the private sector and other critical stakeholders. Finally, they have to establish institutions with a degree of autonomy that permits an adequate representation of the long-term social interests of society, overcoming the pressures of vested-interest groups. The current economic environment, with expanded fiscal space, permits this kind of investment, which, as several experiences have shown, can be very profitable for developing countries.

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Contents

Chapter 1. Shifting wealth and the new world economy

Chapter 2. Channels of shifting wealth

Chapter 3. The new productive landscape and the renewed interest of developing countries in industrial policy

Chapter 4. Emerging issues in implementing industrial policy in developing economies

Chapter 5. Upgrading skills for current and future needs

Chapter 6. Mobilising financial resources

Chapter 7. Bridging infrastructure gaps

Chapter 8. The political economy of industrial policies

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