BUSINESS INSIGHTS ON EMERGING MARKETS 2015

AFRICA | ASIA | LATIN AMERICA | GREEN INVESTMENT

INVESTMENT
ENERGY RISK MANAGEMENT
INFRASTRUCTURE INNOVATION
POPULATION GROWTH MIDDLE CLASS
GREEN GROWTH COMMODITIES
REGULATIONS SKILLS
PRODUCTIVITY
INDUSTRIALISATION
CREDIT

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EM net
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OECD DEVELOPMENT CENTRE

The Development Centre of the Organisation for Economic Co-operation and Development (OECD) was established in 1962 and comprises 26 member countries of the OECD and 24 non-OECD countries. The European Union also takes part in the work of the Centre.

The Development Centre occupies a unique place within the OECD and in the international community. It provides a platform where developing and emerging economies interact on an equal footing with OECD members to promote knowledge sharing and peer learning on sustainable and inclusive development. The Centre combines multidisciplinary analysis with policy dialogue activities to help governments formulate innovative policy solutions to the global challenges of development. Hence, the Centre plays a key role in the OECD's engagement efforts with non-member countries.

To increase the impact and legitimacy of its work, the Centre adopts an inclusive approach and engages with a variety of governmental and non-governmental stakeholders. It works closely with experts and institutions from its member countries, has established partnerships with key international and regional organisations, and hosts networks of private-sector enterprises, think tanks and foundations working for development. The results of its work are discussed in experts' meetings as well as in policy dialogues and high-level meetings, and are published in a range of high-quality publications and papers for the research and policy communities.

For an overview of the Centre's activities, please see www.oecd.org/dev.

OECD EMERGING MARKETS NETWORK

The Emerging Markets Network (EMnet) is an OECD-sponsored initiative dedicated to the private sector. Managed by the OECD Development Centre, the Network fosters dialogue and analysis on emerging economies and their impact on global economic, social and environmental issues.

EMnet gathers top executives (chief executive officers, vice presidents, managing directors, chief financial officers, heads of strategy, chief economists) of multinational companies from diverse sectors, willing to engage in debates with high-level policy makers, including heads of state, ministers and OECD experts.

EMnet events are closed to the public and media and operate under Chatham House rule to encourage open and dynamic discussions on doing business in Africa, Asia and Latin America.

To learn more about EMnet, please see http://www.oecd.org/dev/oecdemnet.htm.

FOREWORD

The private sector plays a major role in economic and social development in emerging and developing countries. Business-led initiatives, such as research and development partnerships, knowledge-sharing platforms, technology and skills transfer, and infrastructure investment, have the potential to kick-start development, enable productivity gains, generate better quality jobs, strengthen skills and promote technological advances. Foreign direct investment now represents one of the largest external financial flows in developing countries. In recent years, emerging markets have represented not only an important destination for foreign investment but also, increasingly, a source of outward investment.

However, emerging markets experienced weak economic performance and low trade growth in 2015. The economic slowdown in China, low commodity prices, financial volatility and slow growth in traditional export markets like the European Union are the main factors impacting the economic outlook. Asia, for instance, has tried avoiding the middle-income trap by moving away from an economic model fuelled exclusively by industry to a knowledge-based one. In this context, innovation and productivity improvements are helping Asian countries transition towards knowledge-based economies. The economic slowdown that began in Latin America in 2010 is continuing. Declining commodity prices, slowdown in major trading partners, and domestic tensions fuelled by growing inequalities in some of the larger economies affected the region's overall economic performance. Far from being a way to foster resilient long-term economic growth, productivity improvements in Latin America are also key to spur a short- and medium-term recovery. And Africa will be home to over 2 billion people by 2050, representing 25% of the world's total population, versus 15% today. The urban population is already among the world's highest and an additional 350 million people will be living in African cities by 2030. Macroeconomic prospects for the continent have been impacted negatively by low commodity prices and weak Chinese demand, fuelling economic disparities among and within countries. The key challenge moving forward is to promote industrialisation, improve infrastructure and create jobs for the growing population.

Promoting investment that is environmentally and ecologically benign underpins sustainable and inclusive growth. Resource scarcity, pollution impacts and their particular exposure to the consequences of climate change amplify the importance and urgency of scaling-up private investment in green infrastructure in developing countries. Green investment opportunities are multiplying in developing countries and the private sector is noticing.

Skills development, better investment policies and regulatory frameworks, greater public-private co-operation, more efficient financial markets and increased regional co-operation are some of the solutions to revive investment and economic development. The private sector highlighted these solutions during the 2015 meetings of the OECD Emerging Markets Network (EMnet), the Development Centre's network of multinational companies.

Since 2007, EMnet has held meetings where top executives, high-level government officials and senior OECD experts gather to discuss business and economic trends in emerging markets. This annual publication now collects for the first time the insights taken from those discussions, providing a comprehensive overview of what multinational companies operating in emerging markets think about challenges and opportunities to revive investment and economic growth in Africa, Asia and Latin America. The analysis builds on the discussions during the 2015 events,

focused on green investments in emerging markets, corporate innovation in Asia, skills and productivity in Latin America, and population growth and market demand in Africa.

This year's edition also features analysis by the Emerging Markets Institute at Cornell University on the dynamics of emerging markets as foreign direct investment destinations. Multinational companies from emerging economies are today amongst the world's largest corporations and their rise is a testimony to the increasing role played by these countries in the global economy.

I would like to take this opportunity to congratulate the EMnet Secretariat and Cornell's Emerging Markets Institute for this important contribution. I am convinced that it will stimulate even more policy discussions at the Development Centre and with governments on the private sector's role in supporting sustainable economic development in emerging economies.

Mario Pezzini
Director, OECD Development Centre

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Chapter 1 "*Emerging Multinationals: The Coming of Age*" was written by Lourdes Casanova (Senior Lecturer, Academic Director, Emerging Markets Institute, Johnson School of Management, Cornell University) and Anne Miroux (Visiting Fellow, Emerging Markets Institute, Johnson School of Management, Cornell University). The authors are grateful to Sukriti Jain and Devesh Verma for their help with data.

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Chapter 3 "Boosting Productivity through Skills and Innovation in Latin America" was written by Kate Eklin and Josep Casas from the EMnet team. Insights from Angel Melguizo (Head of the OECD Development Centre's Latin America and Caribbean Desk) and his team helped to refine the chapter. Useful comments from Lourdes Casanova (Senior Lecturer, Academic Director, Emerging Markets Institute, Johnson School of Business, Cornell University) are gratefully acknowledged.

Chapter 4 "Betting on a Growing Market: Urbanisation, Demographic Boom and Opportunities in Africa" was prepared by Kate Eklin and Josep Casas of the EMnet team. The team thanks Henri-Bernard Solignac Lecomte (Head of the OECD Development Centre's Europe, Middle East and Africa Desk) for his useful feedback.

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ABBREVIATIONS AND ACRONYMS

ASEAN	Association of Southeast Asian Nations
BNDES	Brazilian National Development Bank
COP	United Nations Conference of Parties
ECOWAS	Economic Community of West African States
EMnet	Emerging Markets Network
FDI	Foreign direct investment
GDP	Gross domestic product
GHG	Greenhouse gas
GVC	Global value chain
GW	Gigawatt
MW	Megawatt
ICTs	Information and communications technologies
IEA	International Energy Agency
IT	Information technology
OECD	Organisation for Economic Co-operation and Development
OFDI	Outward foreign direct investment
PPP	Public-private partnership
SDG	Sustainable Development Goals
SME	Small and medium-sized enterprises
SEZ	Special Economic Zone
R&D	Research and development
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
VET	Vocational education and training

EXECUTIVE SUMMARY

Business Insights on Emerging Markets 2015 provides views from the private sector on investment opportunities and challenges in Asia, Africa and Latin America. It also highlights the dynamic changes in foreign direct investment (FDI) flows to and from developing countries in these regions. This report compiles analysis from discussions at meetings of the OECD Development Centre's Emerging Markets Network (EMnet) on doing business in Africa, Asia and Latin America as well as through thematic work on green investment in emerging markets. A report by the Emerging Markets Institute at Cornell University complements this analysis with a study of the changing dynamics of global FDI flows and the increasing role played by multinational firms from developing countries in the global economy.

Emerging multinationals: The coming of age

Emerging countries represent an important destination of FDI and, increasingly, a source of outward investment from "emerging multinationals", or multinational firms from emerging and developing economies. These countries received half of global FDI in 2014, a sharp increase from less than 20% of global FDI flows in 1985. Despite the economic downturn during 2008/09, FDI to emerging and developing countries fell less than that to Europe or North America, highlighting their strength as centres of growth with increasing populations, changing consumption patterns and rising purchasing power. Chinese corporations accounted for about a quarter of all outward FDI from emerging and developing economies in 2015. Emerging multinationals display very specific characteristics, such as family or state ownership, visionary leadership, and a clear understanding of the needs of low-income segments. Evidence also shows that these multinational companies are concentrated in a few specific industries and services (notably manufacturing, mining, metals, oil production and financial services) and prefer acquisitions to gain scale.

The innovation challenge in Asia

In a period of economic uncertainty, innovation through research and development (R&D) can play a central role in increasing domestic productivity and in supporting the transition to knowledge-based economies in Asia. Despite the economic downturn, global R&D spending has increased steadily since 2007 with a greater role played by emerging economies, particularly China. While innovation policy in the region has been driven traditionally by the public sector, governments are expanding public-private partnerships to nurture high-technology zones and develop incubators. Further incentives for private research and development are needed. Infrastructure development, particularly IT and telecommunication, public-private partnerships, skills and technology are essential to foster corporate innovation. Governments need to design policies to support improvements in these areas to create a sound enabling environment for innovation and to move manufacturing activities up in global value chains. EMnet Asia discussions stressed the importance of ensuring local value creation and reinforcing linkages with stakeholders across the value chain by strengthening public investments, encouraging public-private partnerships for innovation in high-value sectors and developing incentives for R&D.

Boosting productivity through skills and innovation in Latin America

The growth momentum in Latin America has been faltering since 2012. Similar to 2014 and 2015, gross domestic product (GDP) growth in Latin America for 2016 is projected to remain below the OECD average. In 2015, GDP in Latin America contracted by 0.3%, in sharp contrast to

its 3.3% average annual growth rate of the previous decade. The current context highlights the region's unresolved structural transformation, exemplified by low levels of productivity and growth. Improving productivity will require more investments to align skills with market demand, leverage FDI in support of innovation and improve infrastructure. Productivity improvements generated by investments in skills and innovation are essential to foster resilient long-term economic growth. Greater dialogue between educational institutions and the private sector is needed to address skills mismatch and align educational priorities with market demand. Facilitating the certification of training schemes developed by the private sector could encourage more corporate training to fill critical skills gaps. Policies supporting foreign investment in R&D are needed to encourage innovation spillovers and drive the growth of knowledge-intensive industries. Developing institutional capacity and regional co-ordination to support investment in infrastructure development is necessary to unlock private capital flows. Finally, greater use of debt capital markets can scale up finance for infrastructure, including more use of project bonds.

Betting on a growing market in Africa: Urbanisation, demographic boom and opportunities

Africa is experiencing unprecedented demographic growth that is opening up new investment opportunities in sectors outside the traditional extractive industries. Population growth and the expansion of urban centres offer opportunities to develop new products and services tailored to urban dwellers and the middle class. A growing domestic energy demand also is capturing the interest of multinational companies in Africa. However, important existing challenges risk slowing down investment flows, such as lack of skilled labour, low level of industrialisation, weak quality of infrastructure and a complex land ownership framework. A sound enabling environment and a strong commitment from all levels of government are essential to develop public-private partnerships that can support infrastructure and industrial development. Clusters, sectoral zones and development of "corridors" can be powerful tools to promote industrialisation and regional integration. Limited regional integration presents a major challenge for development and is particularly crucial to promote industrialisation and energy markets. However, large regional integration agreements may be overly ambitious at this stage. Discussions highlighted that a pragmatic "one country at a time" strategy of leveraging bilateral trade agreements is preferred as a first step to build experience and pave the way for broader agreements in the future.

Green investment in emerging markets

The historic Paris Agreement reached at the 21st Conference of Parties, or COP 21, in Paris in December 2015 offers significant investment opportunities in emerging economies to accompany the transition to a low-carbon economy. To implement the agreement, economic growth must catalyse investment and innovation in new technologies, services and infrastructure that help mitigate and adapt to climate change, reduce pollution, and promote biodiversity conservation. Greener growth can be viewed as an opportunity for businesses. Innovation is incentivised and efficiency improvements are rewarded, while markets for green technologies and services expand. With the increasing cost-competitiveness of renewables, clean-energy infrastructure projects are becoming more attractive to private investors. Creating new tools to pool investments or improve access to capital markets is essential to expand further investment. Policy risk, however, remains the key challenge for scaling up investment. Companies continue to stress the importance of a predictable and stable policy environment for investment in developed and developing countries alike.

Chapter 1

Emerging multinationals: The coming of age

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Anne Miroux, Visiting Fellow, Emerging Markets Institute at the Johnson School of Management, Cornell University

Abstract

"Emerging multinationals: The coming of age" is a contribution from the Emerging Markets Institute at the Johnson School of Management, Cornell University. This chapter considers the context in which emerging multinationals have appeared and thrived.

Key messages include:

- The growth and expansion of multinational companies from emerging economies has driven radical changes in the foreign direct investment (FDI) landscape.
- Emerging multinationals display very specific characteristics, such as, for example, family or state ownership, visionary leadership and clear understanding of the needs of low-income segments.
- Evidence shows that these multinational companies are concentrated in a few specific industries and services (notably manufacturing, mining, metals, oil production and financial services) and use acquisitions to gain scale.
- Eight economies (Brazil, China, Hong Kong [China], India, Malaysia, Mexico, Singapore and South Africa) have accounted for between 50 and 65% of FDI flows to developing and emerging markets over the past 20 years.
- Emerging multinationals have increased their investments beyond their traditional regional focus, with Chinese corporations accounting for about a quarter of all outward FDI from developing countries.

EMERGING MARKETS AS THE MAIN RECIPIENTS OF FOREIGN DIRECT INVESTMENT

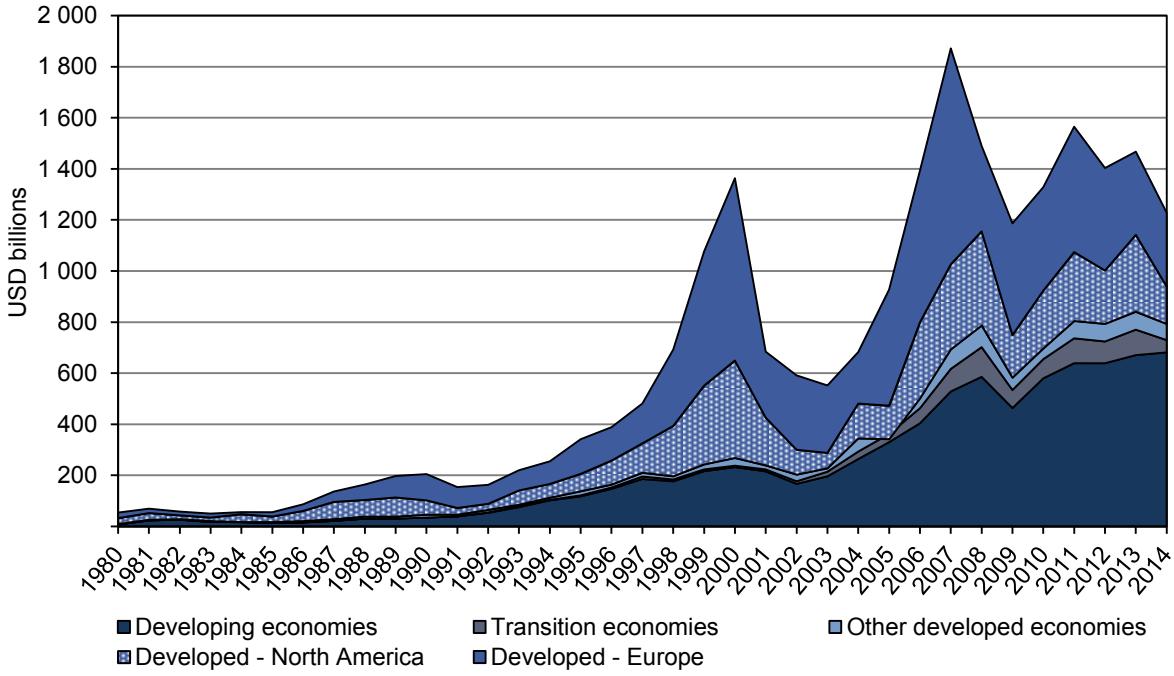
When Raymond Vernon published his seminal book on foreign direct investment in 1971, *Sovereignty at bay: The multinational spread of US enterprises*, the typical FDI situation was that of a developed-country enterprise, often a US firm, investing in another developed country. In fact, most of Vernon's examples referred to US firms expanding into Europe. At that time, almost 80% of FDI was made between developed economies.

Since then, the FDI landscape has changed considerably as a result of the increasing role of developing economies as both recipient and source of FDI. Indeed, over the past three decades, developing countries have evolved from a rather modest position as FDI recipients to become the largest FDI destination in 2014 (Figure 1.1). In 1985, for instance, they accounted for less than 20% of global FDI inflows. Following an almost continuous increase and a marked acceleration in inflows since the early 2000s, their share in global FDI flows has risen significantly (Figure 1.1); in 2014 they received more than half of FDI in the world (Figure 1.2). While it is true that flows have been relatively concentrated in a few developing countries such as the People's Republic of China (hereafter "China"), Brazil and Mexico (see below), all developing countries have experienced an upward trend in FDI.

Between 2003 and 2007, FDI inflows grew by a whopping 231% across the world, from USD 552 billion to USD 1 872 billion (UNCTAD, 2015a).[1] After the 2008/09 global financial crisis, cross-border investments initially took a downturn then went up again through to 2013, when they reached USD 1 467 billion. Data from 2014 with inflows of USD 1 245 billion across the world and preliminary estimates for 2015 amounting to nearly USD 1.7 trillion show, however, that although investments are growing, the situation remains volatile.[2] Until 2007, the European Union (EU) had received the greatest share of global FDI, amounting in 2007, for instance, to USD 793 billion (or 42.4% of world FDI flows). In subsequent years, this share fell drastically, with FDI flows amounting to USD 255 billion in 2014 and an estimated USD 426 billion in 2015 (UNCTAD, 2016), thus fluctuating between 20 and 25% of total flows.

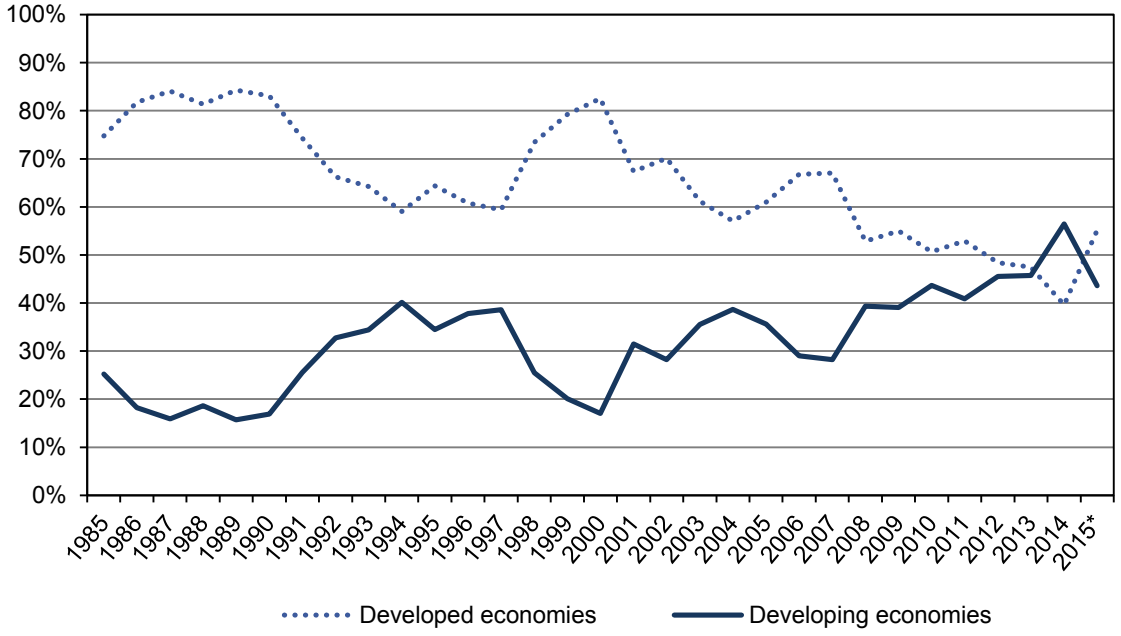
On the other hand, and for about ten years until the early 2000s, FDI flows to developing countries were on a relatively regular upward trend; but it was after 2003, in what has been called the Golden Decade of emerging markets, that two phases of remarkable growth in FDI took place (Figure 1.1). In the first phase, previous to 2009, FDI grew from USD 197 billion in 2003 to USD 586 billion in 2008. The second phase of growth, since the 2008/09 global financial crisis, has also been rapid, rising from USD 464 billion in 2009 to USD 681 billion in 2014, with an estimated USD 741 billion in 2015. Furthermore, even during the 2008/09 recession, FDI to developing countries fell relatively less than to North America and Europe. This evolution demonstrates the strength of "emerging economies" from the developing world.[3] Such economies have been increasingly viewed as upcoming centres of growth and development, thereby prompting major global corporations to invest in them and take advantage of their growing population, changing consumption patterns and increasing purchasing power.

Figure 1.1. **FDI inflows, by region/economy (1980-2014)**



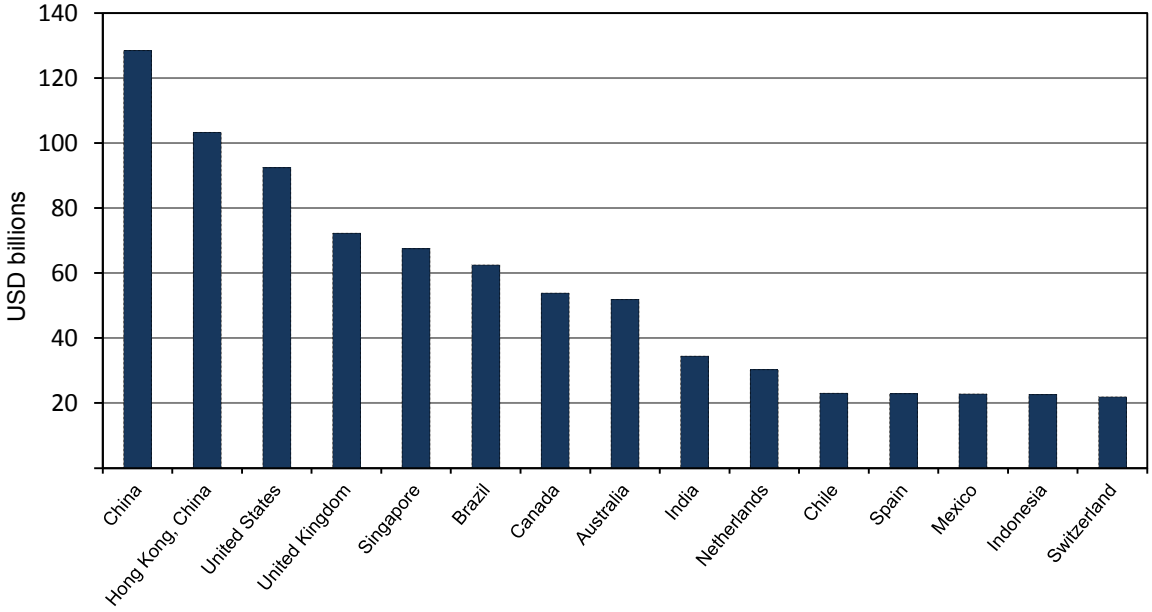
Source: Based on data from UNCTAD (2015b), *UNCTADStat,* http://unctadstat.unctad.org/EN/Index.html (accessed 15 December 2015).

Figure 1.2. **FDI inflows as a share of global FDI flows**



Note:*preliminary estimates
Sources: Based on data from UNCTAD (2015b), *UNCTADStat*, http://unctadstat.unctad.org/EN/Index.html (accessed 15 December 2015) and UNCTAD (2016), "FDI Recovery Is Unexpectedly Strong", http://unctad.org/en/PublicationsLibrary/webdiaeia2016d1_en.pdf.

Figure 1.3. **Top 15 economies by FDI inflows (2014)**

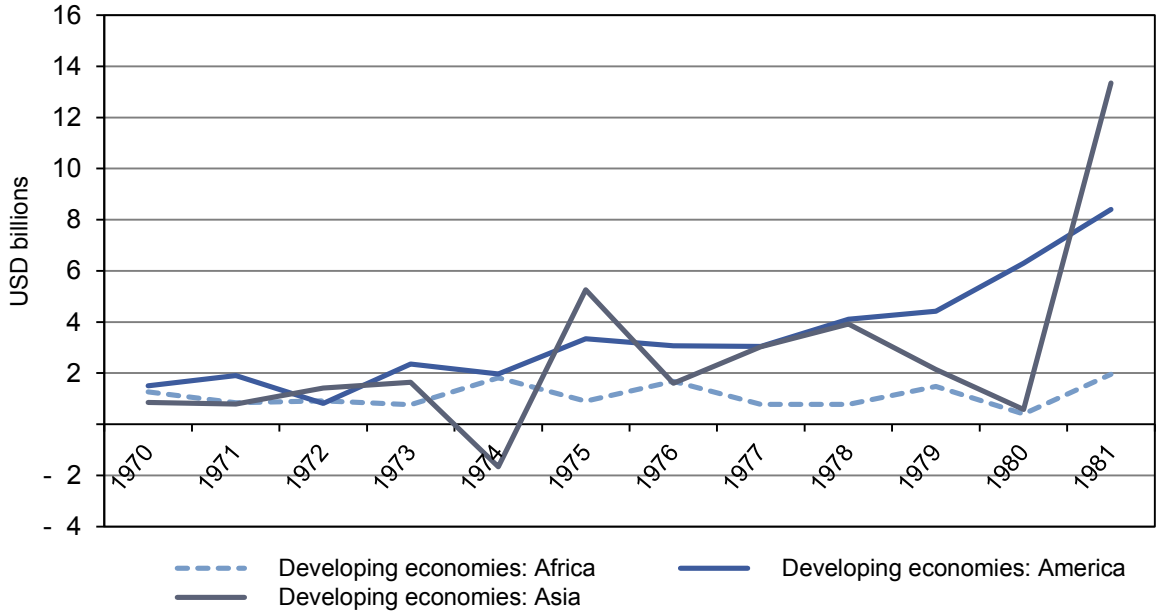


Source: Based on data from UNCTAD (2015b), *UNCTADStat*, http://unctadstat.unctad.org/EN/Index.html (accessed 15 December 2015).

The change in the FDI landscape described above has been driven by the so-called emerging economies, mostly from the developing world, as illustrated by the concentration of FDI in a limited number of developing economies. For instance, eight such economies (Brazil, China, Hong Kong [China], India, Malaysia, Mexico, Singapore and South Africa) have accounted for between 50 and 65% of FDI flows to developing countries over the past 20 years (UNCTAD, 2015a). These economies constitute an increasingly significant share of global FDI inflows and stand amongst the very first in global FDI recipient rankings. In 2014, five of the ten top FDI recipients were emerging economies, with China occupying the first position for the first time ever (Figure 1.3). The lingering consequences of the latest economic crisis (2008/09) and the ensuing stagnation in many developed countries, especially European ones, partly explain the situation. As mentioned above, 2009 marked the beginning of a steep increase in FDI flows to these countries (Figure 1.2).

Latin America had been the FDI destination of choice until 1980, when the so-called “debt crisis” hit the region with the subsequent “lost decade” of the 1980s. Even in 2014, Latin America received altogether USD 159 billion in FDI, slightly more than China (USD 128 billion). Developing Asia as a whole, however, has overtaken Latin America as an FDI-receiving region since 1980 (Figure 1.4). Africa, which during the 1970s was almost at a par with other developing regions, has been lagging behind in spite of a significant increase in foreign investment to the region, mostly for the exploitation of natural resources.

Figure 1.4. **FDI inflows, developing regions (1970-81)**



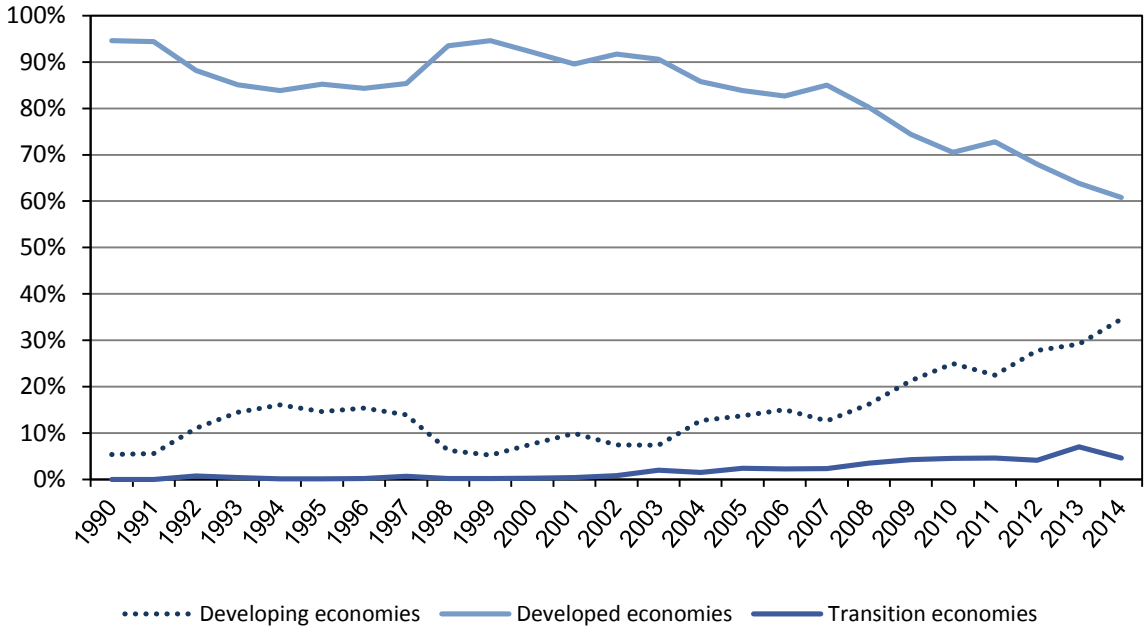
Source: Based on data from UNCTAD (2015b), *UNCTADStat,* http://unctadstat.unctad.org/EN/Index.html (accessed 15 December 2015). Data do not include offshore financial centres in the Caribbean.

During the period analysed in Figure 1.4, behind the FDI flows were multinationals from the United States and Europe investing in each other as well as in the developing world for a variety of purposes, including more efficiency in manufacturing goods, access to natural resources and sale of their own products and services. In addition, the changing competitive landscape in the host economies also drove local firms to invest abroad.

CHINA: A NEW POWERHOUSE IN OUTWARD FOREIGN DIRECT INVESTMENT

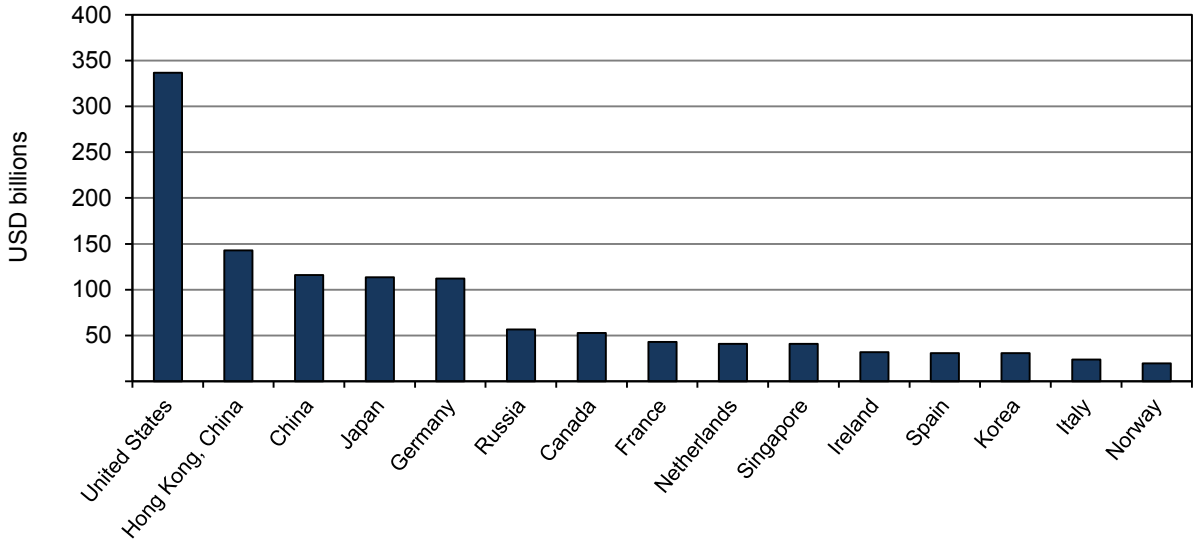
Developing countries have also become a major force as global investors. There were a number of rounds of outward foreign direct investment (OFDI) from developing countries before 2000, including two waves of relatively small magnitude during the mid-1970s and during the second half of the 1980s, and a comparatively larger one during the 1990s. At that time, Latin American countries were the main source of OFDI (Casanova, 2009; Dunning, 2005; Lall, 1984; UNCTAD, 2006). The real take-off in developing countries' investing abroad occurred more recently, in the early 2000s, when a pronounced and largely unabated increase began, which is not surprising considering that an economy needs to reach a certain level of development before its enterprises find themselves in a position to venture abroad.[4] The substantial increase in OFDI that has taken place since then reflects the new status and economic power reached by a number of developing countries. It is a clear demonstration of their economic vitality and of that of their enterprises (see next section). While in 2000 OFDI from developing countries barely reached 8% of global FDI, today about 35% originates in these countries (Figure 1.5). In addition, currently 4 of the top 15 sources of FDI are emerging economies: China, Hong Kong (China), Singapore and the Republic of Korea (hereafter "Korea") (Figure 1.6).[5]

Figure 1.5. **Percentage of OFDI from developed, developing and transition economies**



Source: Based on data from UNCTAD (2015), *UNCTADStat*, http://unctadstat.unctad.org/EN/Index.html.

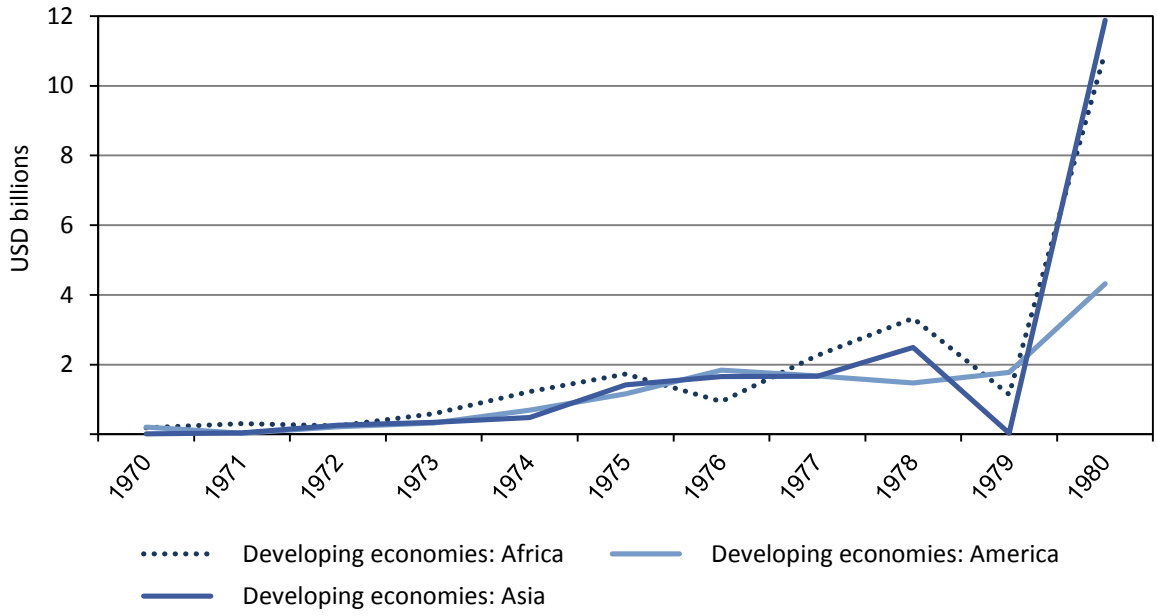
Figure 1.6. **Top 15 economies by OFDI (2014)**



Source: Based on data from UNCTAD (2015), *UNCTADStat*, http://unctadstat.unctad.org/EN/Index.html (accessed 15 December 2015). Data do not include offshore financial centres in the Caribbean.

As was the case for inward FDI (see above), Latin America was a major source of FDI outflows until the early 1980s (Figure 1.7). The so-called "lost decade" (the 1980s) was the turning point when the region lost its leadership and Asia took over as the main source of OFDI.

Figure 1.7. **OFDI from developing regions (1970-90)**



Source: Based on data from UNCTAD (2015b), *UNCTADStat*, http://unctadstat.unctad.org/EN/Index.html.

The concentration of OFDI is even more striking than that of inward FDI. Between 75 and 80% of developing countries' OFDI is sourced in ten countries (a list differing depending on the year), excluding Caribbean offshore financial centres. Beyond this group of ten, the flow of OFDI drops significantly and is virtually nil for many developing countries. This is different from inward FDI, as a large number of developing countries receive FDI flows. OFDI from China has been particularly overwhelming, accounting for about one-fourth of all OFDI from developing countries, and amounting to 2.5 times the total amount of flows from Latin America, excluding Caribbean offshore financial centres (UNCTAD, 2015b). China's role has had a significant impact on the evolution and geographical distribution of OFDI from emerging markets.

FDI from emerging economies has been predominantly South-South and intraregional. It is estimated that in 2013, about 66% of their stock of OFDI was invested in other emerging economies.[6] Asian OFDI has been more regional than Latin America's (Johnson School of Management, forthcoming). This is for historical reasons as well as because of the significant expansion of Asian firms as intraregional production networks. In the past decade, however, a number of changes have taken place regarding the destination of OFDI from emerging economies, leading to a slightly less intraregional orientation of OFDI from emerging economies, with more investments from emerging economies to regions beyond their natural markets and more South-North investments. The reasons for this include the following:

- First, the 2008/09 global financial crisis signalled a new era for OFDI from emerging economies as it led to a number of investment opportunities in developed economies, Europe

in particular. Emerging economies, especially from Asia, were often in a better economic and financial position to take advantage of these opportunities. Combined with strategies for market expansion and/or access to technology, this contributed to enterprises from emerging economies' venturing more forcefully into more distant, developed economies (see below for more on emerging multinationals). In 2013, for instance, an estimated 15% of China's OFDI stock was invested in developed countries, against only 7% in 2007 (Johnson School of Management, forthcoming). A similar trend took place in India, where the stock of OFDI invested in developed countries reached 39% of its OFDI in 2013 (Johnson School of Management, forthcoming).

- At the same time, there has been a lot of South-South investment since 2000, showing an expansion of enterprises from China into Latin America, Africa and Oceania and the other way around. In 2014, China became the main investor in Brazil, and the Chinese oil company Sinopec the single most important investor in the country. Access to natural resources for the growing Chinese economy has been an important motivation, and in 2013, mining accounted for about 15% of Chinese OFDI stock (MOFCOM, 2014).

The growth and expansion of multinationals from emerging economies were behind the radical change in the OFDI landscape..

THE PRIVATE SECTOR'S NEW COMPETITIVE LANDSCAPE: ADVENT OF LARGE CORPORATIONS FROM EMERGING ECONOMIES

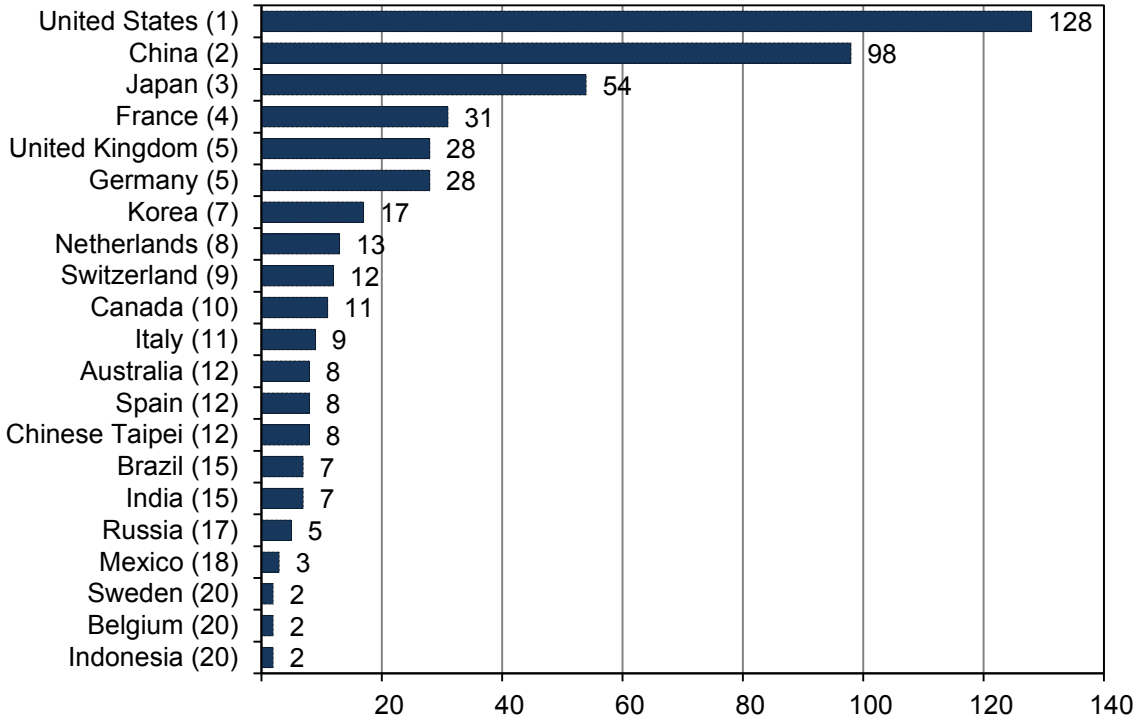
The rise of enterprises from emerging countries is a testimony to the increasing role played by these countries in the global economy. Not only have these countries been the destination and the origin of major investment flows, but also their firms are now amongst the largest corporations. As shown by the data presented in this section, large OFDI flows were spearheaded by a new wave of enterprises from emerging markets. In 2015, a total of 36 countries in the world had corporations ranked in Fortune 500, and half of them were emerging economies (Fortune 500 Directory, http://fortune.com/fortune500/, accessed August 2015). With 139 companies in the list, seven of them (only six if Russia is not included) are amongst the 20 countries with the largest numbers of Fortune 500 companies (Figure 1.8). There were four such countries, with 48 firms, ten years ago. "Emerging multinationals," as such companies are known, are a distinctive feature of the global economy today.[7]

China has clearly been commanding the rising number of emerging multinationals. With 98 companies in the Fortune 500 list, the country now ranks second to the United States, the global leader with the largest number of companies in this list (128 in 2015, Figure 1.8). Since 2004, the number of Chinese companies classified as emerging multinationals has increased more than five times. At this rate, it would probably take China another five to ten years to beat the United States as the country with the greatest number of companies by revenue in the Fortune 500 list. Three Chinese companies were ranked among the first top ten largest companies by revenue in 2015.

The other emerging economies in the top 20 are Korea, Brazil, India, Mexico and Indonesia, in that order, and they are far behind China. Korea, next after China and the only emerging market economy in the top 10, has 17 firms, followed by India (7), Brazil (7) and Russia (5). In these countries, the number of Fortune 500 companies has risen much less dramatically (Figure 1.9).

As in the case of FDI flows, Asia (with China, Korea, India and Indonesia) dominates the picture. Africa does not have any firm in the Fortune 500 list.

Figure 1.8. **Top 20 economies based on the number of companies listed in the Fortune 500 ranking**



Note: The axis indicates the economy and its rank between parentheses based on the number of companies in the Fortune 500 list, and the bars indicate the number of companies included in the Fortune 500 list.
Source: Based on data from Fortune 500 Directory, http://fortune.com/fortune500/ (accessed August 2015) and on Emerging Markets Institute analysis.

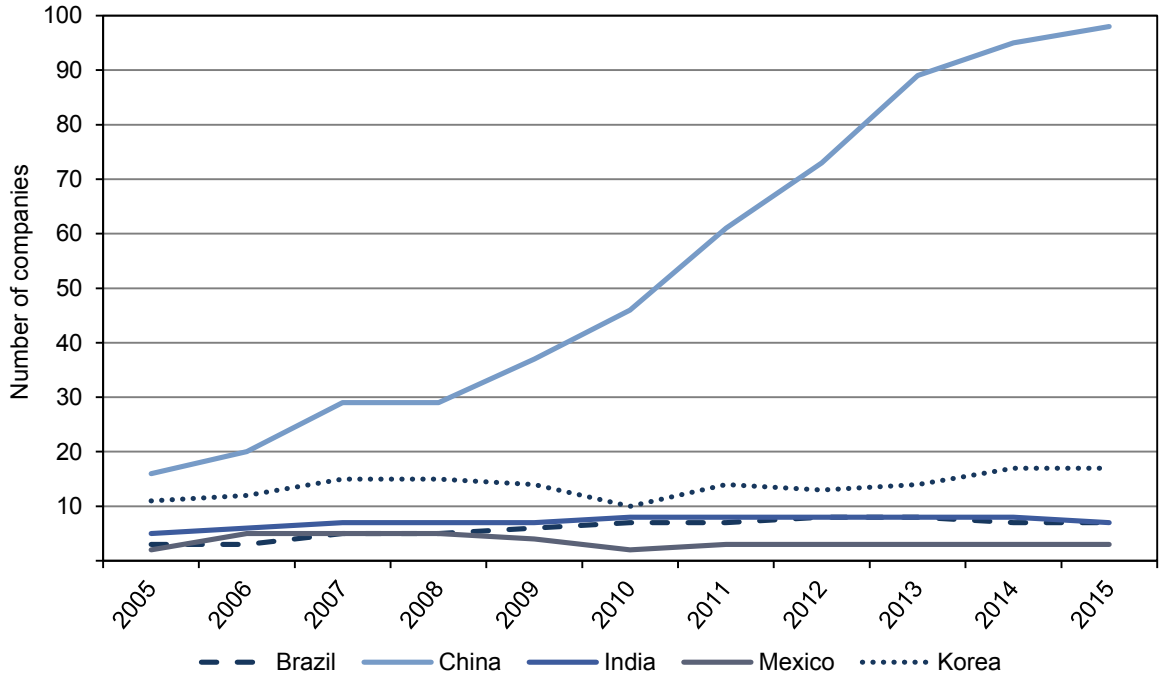
Table 1.1. **Ten largest companies by revenue in 2015 as ranked by Fortune 500**

Rank	Company	Country	Revenue (USD billion)
1	Walmart	United States	485.7
2	Sinopec Group	China	446.8
3	Royal Dutch Shell	Netherlands	431.3
4	China National Petroleum	China	428.6
5	Exxon Mobil	United States	382.6
6	British Petroleum	United Kingdom	358.7
7	State Grid	China	339.4
8	Volkswagen	Germany	268.6
9	Toyota Motor	Japan	247.7
10	Glencore	Switzerland	221.1

Source: Fortune 500 Directory, http://fortune.com/fortune500/ (accessed August 2015).

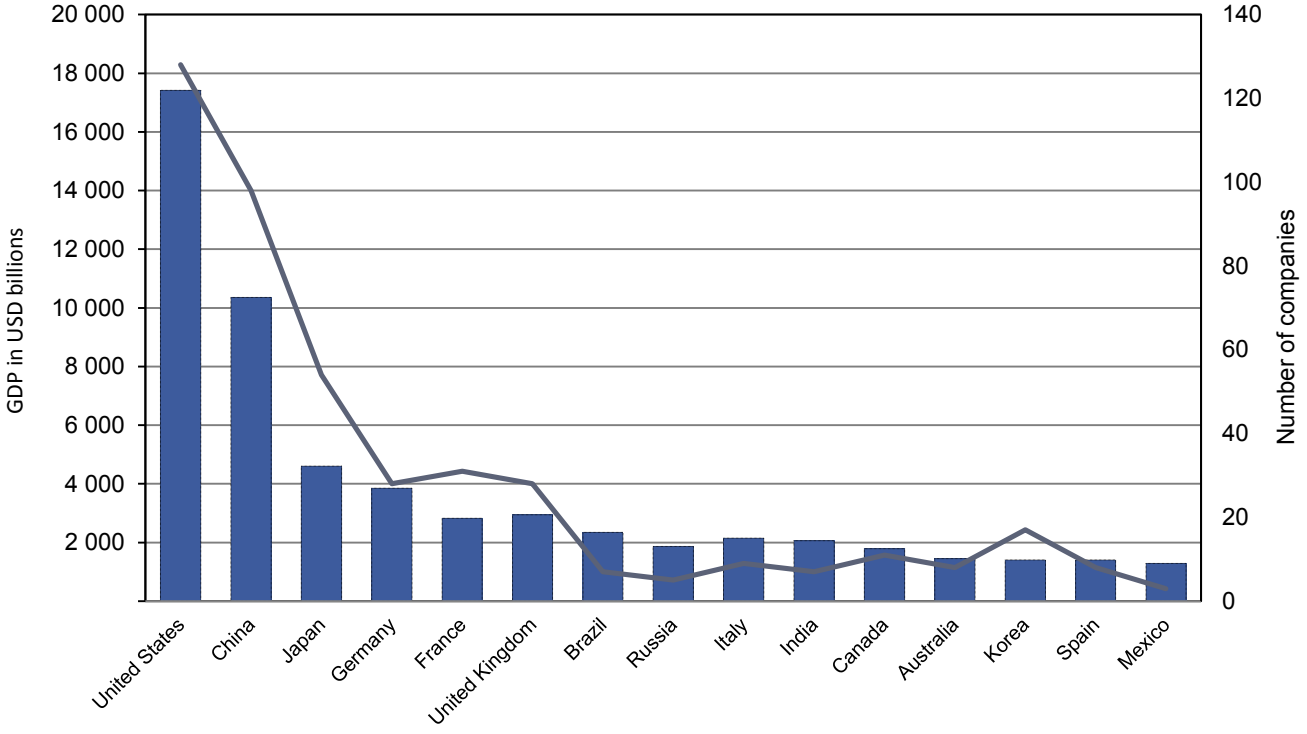
In the same classification (Table 1.1) three of the ten largest companies by revenue in the world are from China (the oil corporations Sinopec and China National Petroleum, and the electrical State Grid). In the same vein, 8 of the 50 largest companies in the world are from emerging countries, with half from China, and 1 company each from Korea (Samsung, ranked 15), Brazil (Petrobras, ranked 28) and Mexico (Pemex, ranked 39). In terms of overall profits, the Chinese state-owned Industrial and Commercial Bank of China (ICBC) leads the pack with USD 44.76 billion, nearly twice the profits of the biggest US bank, Wells Fargo, and ahead of Apple, in second place with USD 39.51 billion in profits. Six of the top ten firms are financial institutions, including four Chinese banks (ICBC, China Construction Bank, Agricultural Bank of China and Bank of China) and two US financial institutions (Wells Fargo and JP Morgan Chase), and the other four are technology firms (Apple and Microsoft in the United States and Samsung in Korea) and the US oil giant Exxon Mobil (Fortune 500 Directory, http://fortune.com/fortune500/, accessed 5 January 2016).

Figure 1.9. **Growth in number of companies included in the Fortune 500 list from major emerging markets**



Source: Based on data from Fortune 500 Directory, http://fortune.com/fortune500/ (accessed August 2015) and on Emerging Markets Institute analysis.

Figure 1.10. **Correlation between nominal Gross Domestic Product and number of companies in the Fortune Global 500 list**

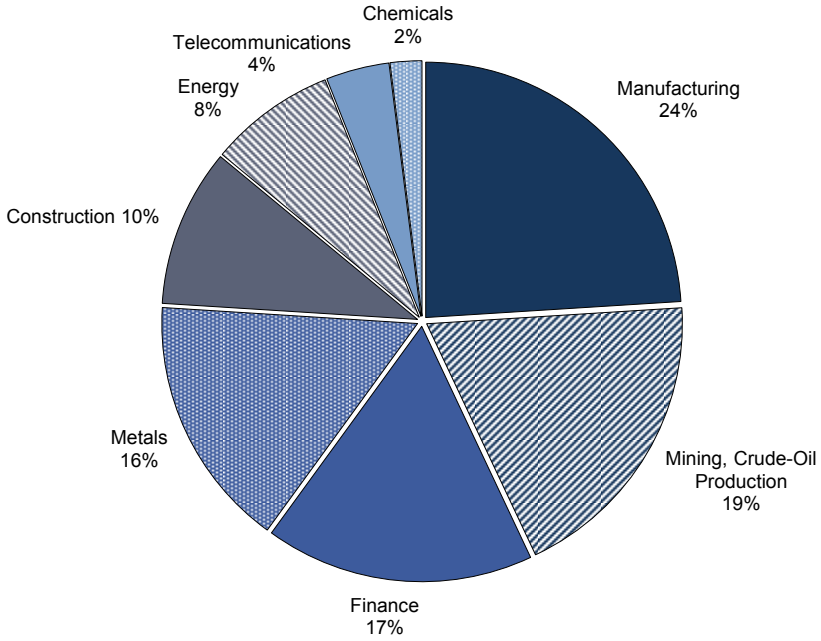


Note: The bars indicate gross domestic product (GDP) in USD billion (left-hand column) and the line indicates the number of companies from the respective country included in the Fortune 500 list (right-hand column).
Source: Based on data from Fortune 500 Directory, http://fortune.com/fortune500/ (accessed August 2015), on World Bank GDP data and on Emerging Markets Institute analysis.

As shown by Figure 1.10, there is a close correlation between the size of the economy as measured by nominal GDP and the number of companies in the Fortune 500 list. The size of the domestic economy is critical for the success of multinationals because it provides a strong home base. Amongst emerging markets, China and Korea are however outliers: the number of companies in the Fortune 500 list "beats" their GDP. Chinese companies have capitalised on the large population of their home country and then gone abroad, while Korean companies began going abroad extensively as early as 20 years ago.

The Fortune 500 companies from emerging economies are particularly concentrated in a few sectors and industries (manufacturing, mining and oil production, and metals) and services, financial services in particular. The industry distribution of Chinese companies in the Fortune 500 list illustrates the situation (Figure 1.11). In these sectors and industries, companies from emerging economies have become world leaders.

Figure 1.11. **Industry distribution of Chinese Fortune 500 companies**



As mentioned previously, emerging multinationals, mainly from China, are global leaders as measured by turnover and even by profits. The picture is more mixed, however, when looking at market capitalisation, which has shown a more volatile situation. Chinese companies such as the ICBC, Sinopec, China National Petroleum and the State Grid, the Brazilian Petrobras and the Korean Samsung have been amongst the world's largest 15 companies by market capitalisation since 2005. At the end of 2015, however, the top ten most valuable companies in the world were all from the United States. When considering the 50 largest firms by market capitalisation, 33 were from the United States, only 8 were from China (ICBC, ranked 12th; China Mobile, 16th; Petrochina, 17th; Alibaba, 21st; Tencent, 27th; China Construction Bank, 30th; Bank of China, 34th; and Agricultural Bank of China, 36th) and one from Korea (Samsung, 37th). This underscores the strength of the US stock market.

With USD 3.322 trillion in assets in 2015, the Chinese bank ICBC is currently the most valuable bank by market capitalisation in the world and the largest bank, well above the US bank Wells Fargo. The second spot goes to the China Construction Bank with USD 2.699 trillion in assets, followed by the UK's HSBC with USD 2.634 trillion in assets, followed by the Agricultural Bank of China with USD 2.575 trillion in assets, then the US banks JP Morgan Chase with USD 2.573 trillion in assets (Fortune 500 Directory, http://fortune.com/fortune500/, accessed 5 January 2016). Overall, China has the largest number of big banks in terms of assets, with 12 of the top 50 headquartered in the country (Accuity, 2016).

This situation may evolve further as the role of China as a major financial centre is reinforced with the prominence of the Shanghai stock market (which with USD 2.7 trillion in market capitalisation is 6th in a tie with the Hong Kong stock market), the acceptance of the yuan as the fifth member (with the US dollar, the yen, the sterling pound and the euro) of the IMF's special drawing rights (SDR) currencies, the beginning of operations of the Asian Infrastructure Investment Bank, the first international financial institution launched by a developing country, and the launch of the New Development Bank, operated by the BRICS states.

ARE EMERGING MULTINATIONALS CHANGING THE RULES OF THE GAME?

As pointed out by Casanova (2009), emerging multinationals have unique characteristics that differentiate them from their peers in developed countries, including the following:

- Most of the multinational corporations in emerging markets are family-owned conglomerates or state-owned. This is the case of many Brazilian companies such as Votorantim or Camargo Correa, or the Chilean Luksic Group. On both sides of the Pacific, some of the biggest companies are state-owned, such as the Mexican oil company Pemex and the Colombian oil company Ecopetrol.
- These emerging multinational corporations usually have strong leadership at the top with a long-term vision. Most of the leaders have long tenure and graduate to become visionaries at the helm of their companies. Carlos Slim is the ultimate Latin American leader of the Carso group along with the late Lorenzo Zambrano, who led the Mexican building materials company Cemex.
- They have a good understanding of the needs of the bottom of the pyramid. Operating in an emerging market helps them come up with products at the lowest possible price by offering the right proposition and value. Efficiency is part of the DNA of local firms in emerging markets, and most of them develop products for all segments of the population. Havaianas, the flip-flop sandals developed by the Brazilian Alpargatas, were initially designed as very cheap shoes for those who could not afford another pair of shoes.
- Business-model innovation with efficiency in operations is essential to these companies. Cost effectiveness is key to success because of the low margins usually prevailing in emerging markets. Although Mexico's América Móvil did not discover the "prepaid" formula for mobile phones, it was the company that expanded it in Latin America and was behind the tremendous success of mobile penetration in Latin America. While it may not last long, in 2015 mobile penetration in the region was still the highest in the world amongst developing regions.
- Emerging multinationals tend to use internationalisation as a learning process and hedging strategy, and they use acquisitions to gain scale. The medium-sized adhesive company Artecola from Rio Grande do Sul in Brazil has appeared in the ranking produced by Fundaçao Dom Cabral as one of the most international companies in Brazil. At a time when many Brazilian companies are lowering their revenue forecast, Artecola is overcoming the situation thanks to its international exposure. International revenues provide a "natural hedge" against falling consumption patterns at home.
- They demonstrate a strong ability to navigate through major crises, as well as flexibility and ability to adjust. During the Southeast Asian crisis in 1997, the Russian crisis in 1998, the Brazilian one in January 1999, and the Argentine one in 2001/02, to name a few, emerging multinationals have shown resilience to survive in environments with hyperinflation and sudden overnight loss of the local currency by as much as 100%. This requires anticipation, agility and long-term thinking while managing the balance sheet day-to-day.

The rise of emerging multinationals is triggering a number of changes in the private sector, which has been dominated for the past 50 years by multinationals from developed countries (see for instance Casanova, 2009; Casanova and Kassum, 2013; Cuervo-Cazurra, 2012; Cuervo-Cazurra and Ramamurti, 2015; Fleury and Fleury, 2012; Guillén and García-Canal, 2009). The following statements require further discussion and research. Emerging multinationals:

- are becoming competitive power forces in traditional and also innovative, technology-driven industries; for instance, Samsung, the Korean telecom equipment provider, has become the world leader by sales of 3G phones, ahead of Apple;
- have a competitive edge and are changing the rules of the game because they tend to compete with very low prices based on low labour costs but also on increasing automation of their manufacturing base;
- are quickly learning and incorporating innovation and knowledge as part of their products and services; development of fast-train networks in China can only be explained by the way Chinese companies absorbed knowledge from traditional train manufacturers such as Alstom and Siemens, and adjusted it to their local needs;
- are forcing changes in industry standards so far mainly dominated by US and/or European enterprises; for instance, China Mobile, the biggest mobile operator in the world, uses the TD-SCDMA standard for the 3G mobile phones provided by the third largest telecom provider (after Huawei and ZTE), Datang Telecom.[8]

Box 1.1. Government support to OFDI policies

In the past 20 years, there has been overall a clear shift in emerging economies towards much less restrictive policies on outward foreign direct investment (OFDI). Initially, when not banned outright, OFDI was subject to foreign-exchange controls, lengthy approval processes, reporting requirements or specific sectoral or geographic restrictions. This has changed as most emerging economies in the late 1980s progressively liberalised outward investments and moved towards more supportive policies. Nonetheless, while there is a large number of developing and emerging economies with clear and determined policies to attract inward FDI, the number of emerging economies with proactive OFDI promotion policies is still limited.

China is a striking example of such a shift from restriction to active promotion. The marked increase in investment by Chinese multinationals, for instance, is concomitant to the “go global” strategy of the Chinese government that replaced the policy of tight restrictions and control experienced before then. Launched at the turn of the century, this strategy was reinforced in the second half of the 2000s through a number of specific measures and incentives aimed at facilitating OFDI and at promoting the competitiveness of Chinese multinationals abroad.[9] Korea, one of the top investors amongst emerging economies, liberalised its outward FDI policies almost completely during the 1990s such that today, for nearly all investment abroad, only prior notification and approval by a foreign-exchange bank is required.[10] It has now moved into proactive promotion and support of outward FDI, in particular through the activities of the Korea Trade and Investment Agency (Kotra) (Nicolas, Thomsen and Bang, 2013). Other countries in Asia such as Singapore and Malaysia have also taken measures to support or facilitate OFDI over the years.

In Latin America, while governments have increasingly liberalised OFDI, most of them have not engaged in truly proactive promotion policies. Brazil in that respect is unique in Latin America because the state backs FDI in the form of financial support from the Brazilian National Development Bank (BNDES) to facilitate the internationalisation of Brazilian companies (ECLAC, 2013). In Brazil, the state and its industrial-development policies thus played an important role in the successful outcome of internationalisation, which encouraged the emergence of national champions that would later become big international players. These include the state oil company Petrobras and the world’s largest iron-ore mine Vale, as well as the aircraft manufacturer Embraer.

The rise of Chinese and Korean multinationals is bringing a sometimes forgotten fact to the surface, which is that size matters and government policies play a key role in enterprise development (Box 1.1).

In early 2016, the slowdown in China, and the fall of commodity prices and tightening of the economy in the United States are portending a more challenging phase for developing and emerging economies. Although it could be argued that developing economies have learnt from previous crises and are better prepared this time, whether this is the beginning of a slowdown or a more important and deeper crisis remains to be seen. The recent trends underscored above regarding investments in developed countries seem to be a strategy for emerging multinationals to offset possible market volatility at home and may be a survival strategy. At the same time, and for the first time in hundreds of years, there is a powerful emerging economy, China, whose role in the crisis may be key. Time will tell.

Notes

1. This data does not include offshore financial centres in the Caribbean.
2. Preliminary estimates suggest that global investment flows reached USD 1.7 trillion in 2015 largely as a result of an increase in mergers and acquisitions (UNCTAD, 2016).
3. There is no actual definition of emerging economies. There are, however, a number of existing lists of emerging economies. They can be defined broadly as economies that have started to grow but have not yet reached a mature stage of development and are still particularly vulnerable to economic and political risks. A pragmatic definition proposed in 2012 is based on the following characteristics: i) intermediate income; ii) catch-up growth; iii) institutional transformations; and iv) economic opening and integration into the global economy (Vercueil, 2012).
4. See for instance the investment development path (IDP) theory, according to which the outward and inward FDI positions of a country are systematically related to a country's level and structure of economic development. On the theory and its limitations see, for instance, UNCTAD (2006) and Dunning (2005).
5. Offshore financial centres are excluded here.
6. Authors calculations based on data from UNCTAD (2015a).
7. Here, a company is considered an emerging multinational based on the location of its headquarters (i.e. in an emerging economy). Samsung, for instance, is considered an emerging multinational because its home base is Korea, which is defined for the purposes of this report as an emerging economy.
8. The TD-SCDMA standard is the first Chinese telecom standard and has been approved by the International Telecommunication Union. A previous generation of this standard (TD-CDMA) was developed by Siemens AG and later sold to Datang because it could not sell it in Europe, where the standard in use was WCDMA.
9. The strategy was formally launched in 2000. Specific support policies were adopted in 2006 in particular and regulations on the administration of OFDI in 2009 (Johnson School of Management, forthcoming).
10. Liberalisation of OFDI had begun in the 1980s but the most drastic measures were taken during the 1990s, culminating with the implementation of the notification system in 1999 (UNCTAD, 2006; Johnson School of Management, forthcoming).

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Chapter 2

The innovation challenge in Asia

Abstract

This edition of the EMnet Asia Policy Note provides insights and suggested policy recommendations from the business sector on innovation challenges in Asia. The note gives an overview of the innovation landscape in Asia, offers business insights on innovation-related challenges and assesses policy makers' efforts to support private sector-led innovation for development. The analysis builds on discussions at the business meeting held on 2 April 2015 at the OECD headquarters in Paris and organised by the OECD Emerging Markets Network (EMnet).

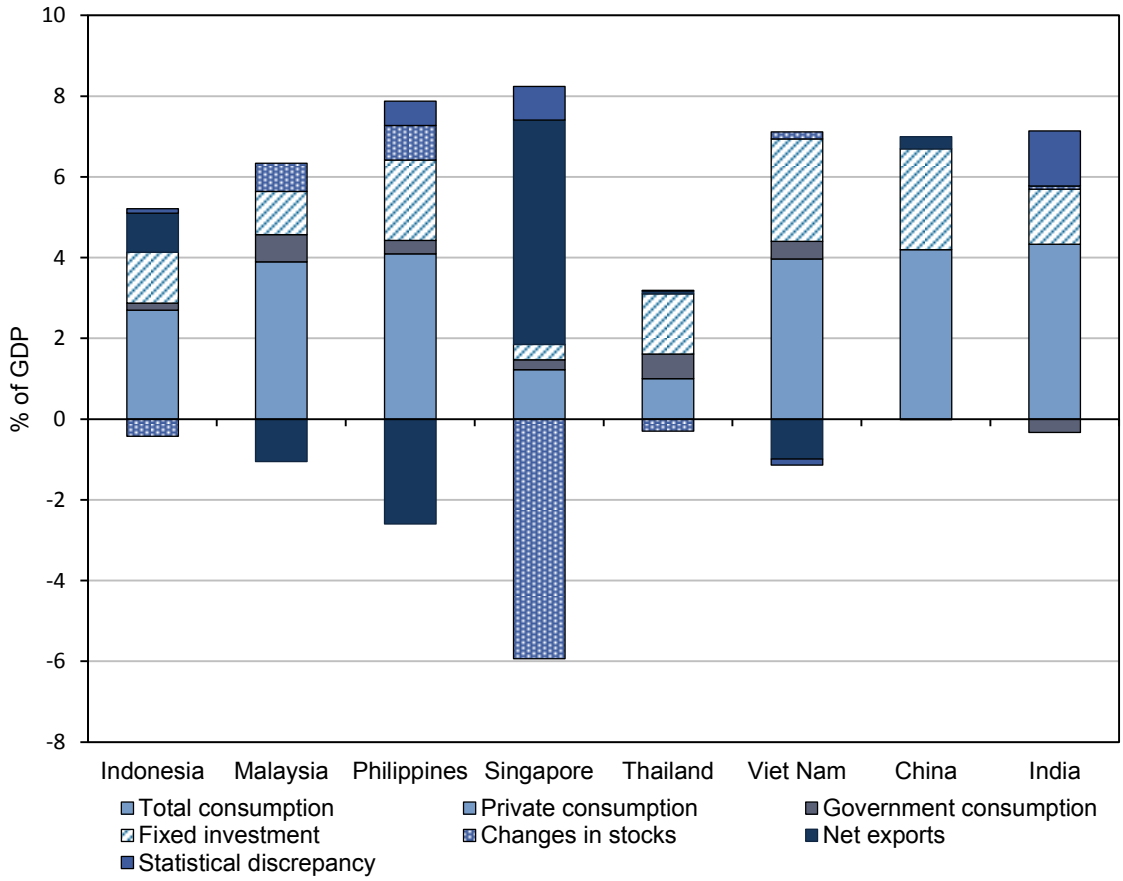
Key messages include:

- External factors are fuelling uncertainty about economic development in Asia. Innovation through research and development (R&D) can play a central role in increasing domestic productivity levels and support the transition to knowledge-based economies.
- Despite the economic downturn, global R&D spending has increased steadily since 2007 with a greater role played by emerging economies, particularly China.
- While innovation policy in the region has traditionally been driven by the public sector, governments are expanding public-private partnerships to nurture high-technology zones and develop incubators. Further incentives for private research and development are needed.
- Infrastructure development, particularly IT and telecommunications, public-private partnerships, skills and technology play a critical role in fostering corporate innovation in Asia. Governments need to design policies to support improvements in these areas to create a sound enabling environment for innovation and move manufacturing activities up in global value chains.
- Better access to finance is needed, particularly to support early stage development and further investment in innovation.
- Motivated by the need to reduce costs and improve profitability, green innovation is driving resource-efficiency improvements.

BACKGROUND: ASIA'S BUSINESS AND ECONOMIC OVERVIEW

According to OECD estimates, Asia will account for 34% of the world's gross domestic product (GDP) by 2019 (OECD, 2015). GDP growth in the 12 Emerging Asia countries[1] (ASEAN-10, People's Republic of China and India) will be robust with a forecasted annual average growth rate of 6.2% for 2016-20 (OECD, 2016). Yet, there are substantial differences amongst growth paths. In the Philippines and Viet Nam robust growth is projected to continue at higher than 6% over 2016-20. In Indonesia and Malaysia growth slowed down in 2015 due to reduced external demand. Thailand's growth reached 2.7% in 2015, a marked improvement from 2014, when political turmoil reduced growth to 0.7%. The low-income countries of Southeast Asia (Cambodia, Lao People's Democratic Republic [hereafter "Lao PDR"] and Myanmar) are expected to grow at more than 7% over 2016-20 (OECD, 2016). Brunei Darussalam and Singapore will sustain more moderate growth prospects. Finally, the slowdown in China will put downward pressure on regional growth. However, the overall prospects for the Southeast Asia region are favourable. Figure 2.1 shows the contributions to growth of each of the Asian emerging economies in the first half of 2015.

Figure 2.1. **Contributions to growth in Emerging Asia in the first half of 2015**



Note: Data for Viet Nam refer to 2014. Data for China are from the Asia Development Bank.
Source: CEIC, cited in OECD (2016), *Economic Outlook for Southeast Asia, China and India 2016: Enhancing Regional Ties*, http://dx.doi.org/10.1787/saeo-2016-en.

External factors are having an increasingly important impact on Asian economies. Reduced demand from China and the uncertain impacts of Japan's Abenomics, combined with the expected US monetary policy normalisation, are fuelling economic uncertainty. While declining oil prices have had a positive impact on current-account balances in oil-importing nations, they have also created incentives for developing energy-intensive manufacturing.

From 1970 to 2010, capital accumulation played a major role in the catch-up stage and during the early stages of industrialisation in Asia (OECD, 2013). However, the role of pure capital accumulation as a growth driver is declining in some Asian economies. In addition, increased competition in manufacturing sectors is reshuffling global value chains (GVCs) and has shifted some production activity to lower cost locations within Asia or Africa. Innovation in manufacturing and improved productivity can help Asian countries regain their comparative advantages. For Asian countries, moving away from an economy fuelled exclusively by industry to a knowledge-based one can help to avoid a "middle-income trap" (see Box 2.1). Innovation through research and development (R&D) and improvements in workforce productivity can play a central role in increasing domestic productivity levels and support the transition to knowledge-based economies (OECD, 2014a).

Box 2.1. The "middle-income trap" and the "flying geese" paradigm

The economic phenomenon by which an emerging economy stagnates after several years of impressive growth is commonly referred to as the "middle-income trap." "Trapped" countries fail to transition from an industrial economy to a knowledge- and innovation-based one. Investment in innovation is therefore a key element to promote growth and avoid entering a middle-income trap. Some Asian countries like Malaysia have been growing by accumulating capital, but productivity levels will need improvement to avoid a middle-income trap.

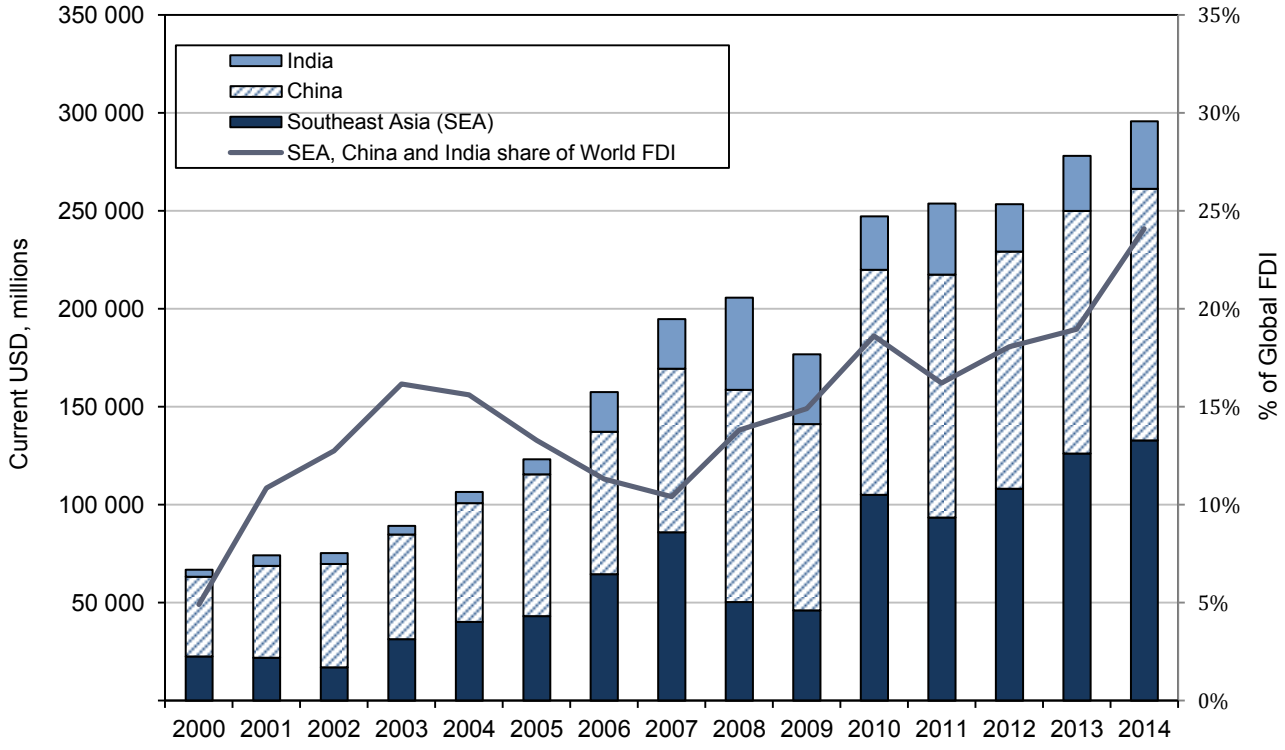
An alternative framing can be seen in the "flying geese" model, first introduced by Japanese economist Kaname Akamatsu in the 1930s and later revived in the 1960s. The model refers to the process by which older technology and know-how is passed down a chain of developing countries as part of the industrialisation process. A leading country can be imagined as the "first goose" in a V-shaped formation. As it develops economically it adopts new technologies. The older technologies can be passed down to other countries in the formation. In the case of Asia, Japan was the "leading goose" with strong economic and technological development, and it was followed by other East Asian countries like Korea and Singapore. ASEAN countries, China and India are the next tier in the industrialisation formation.

Sources: Kasahara (2013), "The Asian Development State and The Flying Geese Paradigm", http://unctad.org/en/PublicationsLibrary/osgdp20133_en.pdf; OECD (2014a), *Perspectives on Global Development 2014: Boosting Productivity to Meet the Middle-Income Challenge*, http://dx.doi.org/10.1787/persp_glob_dev-2014-en

FDI inflows are still growing

Foreign direct investment (FDI) inflows into Southeast Asia,[2] China and India have been steadily growing over the last decade (see Figure 2.2). In 2014, China surpassed the United States as the largest global FDI recipient, with FDI inflows into China reaching USD 129 billion compared to USD 92 billion to the United States. East and Southeast Asia is the largest FDI recipient sub-region in the world. At the regional level, China is followed by Hong Kong (China) (USD 103.3 billion), Singapore (USD 67.5 billion), Indonesia (USD 22.6 billion) and Thailand (USD 12.6 billion).

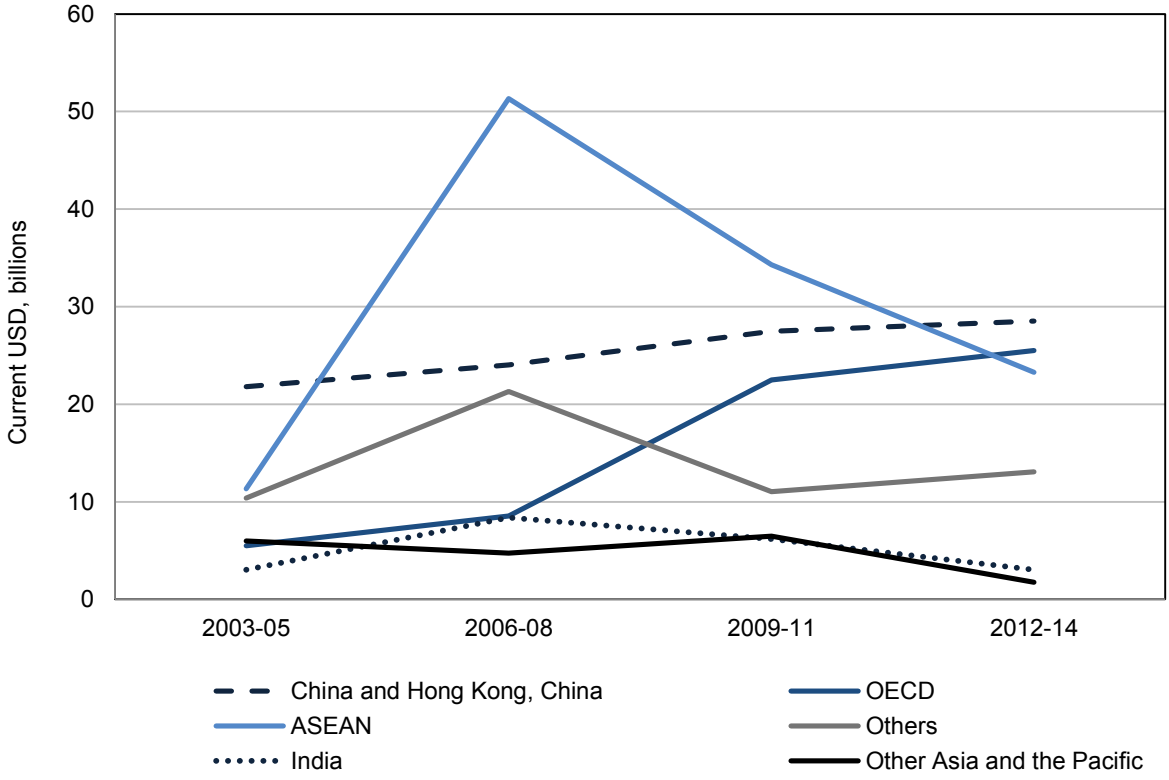
Figure 2.2. **FDI inflows into Southeast Asia, China and India (2000-14)**



Source: UNCTAD (2015), UNCTADStat (database), http://unctadstat.unctad.org/EN/Index.html.

On the other hand, greenfield investments into ASEAN countries have declined across almost all countries with the exception of Myanmar (see Figure 2.3). In 2011, Myanmar started a series of political and economic reforms that have successfully attracted foreign investors (OECD, 2016). In most of the region, manufacturing is the leading sector for new investment. However, services are a major source of greenfield activity in Cambodia, Myanmar and Hong Kong (China). Manufacturing investment projects are primarily related to chemicals, food and tobacco, coal, oil and natural gas, and metals. A source of concern is the recent drop in total intra-ASEAN greenfield-investment volumes. From 2003 to 2008, investors from Thailand, Malaysia and Singapore helped to lead strong growth in greenfield-manufacturing investment into ASEAN countries. Although Malaysia and Singapore have reduced their outward manufacturing investment since 2008, this had been offset by strong continued growth from Thailand. However, since 2011, a persistent decline in ASEAN manufacturing investment from Thailand has reduced overall volumes of intra-ASEAN manufacturing investment to worrisome levels (OECD, 2016). Beyond manufacturing and services, key sectors for greenfield investments in the region include natural-resource extraction, power, construction, information and communications technology infrastructure, and business and financial services.

Figure 2.3. **ASEAN aggregate greenfield investment by region (2003-14)**



Source: OECD (2016), *Economic Outlook for Southeast Asia, China and India 2016: Enhancing Regional Ties*, http://dx.doi.org/10.1787/saeo-2016-en. Calculations based on the fDI Markets dataset (2015) http://dx.doi.org/10.1787/888933309386

INNOVATION IN ASIA

Innovation goes far beyond the confines of research labs; it includes users, suppliers and consumers, in government, business and non-profit organisations, and across borders, sectors and institutions. Asian firms can promote innovation across products, processes and business models. Innovations can be implemented through a range of different channels such as R&D, technology adoption, minor modifications or incremental changes, imitation (including reverse engineering) and combining existing knowledge in new ways (Arundel et al., 2008). Adequate financing is a key element for successful innovation.

Despite the economic downturn, global R&D spending has increased steadily since 2007 with a greater role played by emerging economies (OECD, 2014b). China is now a major driver in R&D spending and is set to become the world's largest R&D spender (OECD, 2014b). In the last decade, the share of global R&D spending by OECD countries declined from 90 to 70%, whereas China's investment doubled between 2008 and 2012 to reach USD 257 billion (OECD, 2014b). In addition, the 2015 Global Innovation Index, developed by the Word Intellectual Property Organisation (WIPO), ranked Singapore as the 7th most innovative country, followed by Korea (14th), Japan (19th), China (29th) and Malaysia (32nd) (Soumitra, Lanvin and Wunsch-Vincent, 2015). Scientific publications can also be used as a proxy for innovation and scientific production. While the economic crisis has hurt traditional producers of scientific and technological knowledge

such as the United States and Japan, China's share of global engineering and scientific publications grew from 1to 11% between 2001 and 2011 (OECD, 2014b).

Asian economies can be classified into three groups based on innovation policies and progress. The East Asian forerunners (e.g. China, Korea, Hong Kong [China] and Singapore) already rely on their innovation strategies to promote growth. Emerging Asia countries such as Indonesia, Malaysia and Thailand form a second group that already has established important manufacturing capabilities and can benefit from developing innovation policies to sustain growth and avoid the middle-income trap. Finally, developing Asian economies such as Cambodia or Lao PDR need to make further investments in infrastructure to sustain innovation-fuelled growth. A more detailed analysis on Southeast Asia innovation and respective policies can be found in the OECD publication *Innovation in Southeast Asia* (OECD, 2013).

Innovation challenges for Asia

Although over 2011-15 most Asian countries saw high growth rates, averaging more than 6.5% for Emerging Asia, many still face a series of challenges for a smooth transition to innovation-based economies (OECD, 2016). Better access to finance is needed in countries like China, where state-owned enterprises often have priority access to capital. Regulatory barriers, such as restrictions on venture capital investments in China, can notably limit investment in new projects (OECD, 2008).

Improved educational systems will also play a key role in supporting innovation. Educational challenges differ vastly amongst Asian countries. For example, a 2015 ManpowerGroup survey highlighted that despite Japan's high-ranking education system, 83% of employers in the country reported difficulty finding people with adequate skills (ManpowerGroup, 2015). Furthermore, recent analysis of R&D personnel (i.e. researchers, technicians and support staff) in Southeast Asia shows that finding the right skills for innovation can be challenging in countries like Cambodia, Lao PDR and Brunei Darussalam (OECD, 2013).

Proper infrastructure development also will be crucial, especially for developing Asian countries such as Cambodia, where basic infrastructure is still lacking. Developing telecommunications and information-technology (IT) infrastructure is particularly important, as this basic infrastructure is a prerequisite for developing additional technology and communications companies and is the foundation of an effective innovation policy.

Finally, as is the case in other emerging markets, most innovation policy in Asia has been traditionally driven by the public sector. For instance, the Government of India launched the Digital India initiative with the vision of transforming India into a "digitally empowered society" (Government of India, 2015). The goal of Digital India is to ensure that government services are made available to citizens electronically by improving online infrastructure and by increasing Internet connectivity. However, countries like Singapore already have started to shift towards a more business-led innovation model. The Singaporean government is actively supporting entrepreneurship. For example, Block 71 is a government-sponsored co-working space that brings together hundreds of entrepreneurs. The National University of Singapore also sponsors 120 to 150 students per year to undertake one-year internships in technology-rich areas such as Silicon Valley. Many students start up companies, and when they return to Singapore they are offered matching grants and placed in an incubator to help their businesses grow (The Economist, 2014).

GOVERNMENT EFFORTS TO SUPPORT INNOVATION IN THE REGION

Innovation is a key element of sustainable economic growth, and governments have a role to play by encouraging innovation through direct public-sector research and supporting the private sector, and through public-private initiatives. Some Asian governments have been successful in increasing their gross R&D expenditures to OECD levels. For instance, China and Singapore spend around 2% of their GDP on R&D, comparable to OECD levels, whereas Malaysia and Thailand spend less than 1% and 0.25%, respectively, on R&D (OECD, 2013).

Public-sector research in Asia

Governments can play a key role in supporting innovation, particularly in areas where the private sector may lack incentives to invest in R&D, or in cases where research is essential for national interests (such as national defence). Public-sector research is conducted primarily by public universities and institutions (OECD, 2014b).

While in OECD countries public-sector R&D tends to be considerably smaller than private R&D spending, we see a more diverse situation in Asia. For example, in Indonesia or Viet Nam more than 80% of gross R&D spending is made by public institutions. This number is considerably smaller in Malaysia, where the private sector plays a prominent role in R&D activities (OECD, 2013). In more developed Asian economies, most technical research is conducted by public universities while in less technologically advanced countries, research laboratories, public hospitals and clinics still play a major role in this area, although in many cases they are underfunded.

Government support to business R&D

Governments also can promote private-sector innovation through mechanisms such as innovation policies, tax credits and subsidies. Asian countries can find inspiration in successful private innovation programmes like the Small Business Innovation Research (SBIR) programme in the United States, which supports small innovative companies and has successfully contributed to the launch of large technology companies such as Qualcomm or Symantec. Singapore's Agency for Science, Technology and Research (A*STAR) has established public-private councils to consult regularly with key stakeholders and businesses on activities in support of R&D and innovation, including training in the areas of science, engineering and technology.

Policy makers are focusing now also on building up innovation infrastructure to move manufacturing activities up in GVCs. In Malaysia, for example, the AIM-Steinbeis programme seeks to help companies move up in the GVC and provides small- and medium-sized enterprises (SMEs) with access to commercial expertise, R&D, and product and process improvement. Moreover, through the Vision 2020 plan, Malaysia aims to become a high-income country by implementing policies that foster human-capital development, inclusiveness, green growth, infrastructure development and knowledge-based activities. Box 2.2 provides additional details on Malaysia's business-focused innovation policies and programmes.

Box 2.2. Innovation policies and programmes in Malaysia

Malaysian companies generate more jobs and R&D investment than their regional counterparts, something that sparked discussion at the EMnet Asia meeting. The role of SMEs is particularly interesting in the Malaysian case, where SME activity accounts for more than 30% of GDP and represents 25% of exports. There is widespread support from public authorities for business-led innovation through SME development agencies and assistance in the application process for public-private partnerships, and this has been successful in increasing the innovation rate of SMEs. Furthermore, Malaysia has developed a Technology Commercialisation Platform under the SME Masterplan, which aims to turn innovations into booming products and services by removing obstacles to commercialising R&D developments and increasing the uptake of information and communications technology and productivity-improvement technology.

Other programmes, such as SIRIM-Fraunhofer or the Public-Private Research Network, promote public-private partnerships. SIRIM-Fraunhofer promotes collaboration between local universities and businesses in applied research or productivity development, while the Public-Private Research Network connects research centres and Malaysian SMEs.

Sources: Fraunhofer IAO (2015), "Cooperation Between Fraunhofer IAO and SIRIM, the Malaysian Research Organization", www.iao.fraunhofer.de/lang-en/technology-innovation-management/iao-news/1219-innovation-impetus-for-southeast-asia.html; National SME Development Council (2012), "Catalysing Growth and Income" https://s3.amazonaws.com/media.guidebook.com/upload/40012/extra/Part1_SME_Masterplanv1.pdf;
OECD (2016), *Economic Outlook for Southeast Asia, China and India 2016: Enhancing Regional Ties*, http://dx.doi.org/10.1787/saeo-2016-en

Malaysia is not an isolated case in applying successful innovation policies. China's desire to develop a strong domestic private sector is illustrated by its Made in China 2025 strategy, an ambitious plan to move Chinese manufacturers up the value chain to an "Industry 4.0" model. China offers three different financial tools: grants, long-term interest subsidies and venture-capital funds.

India is also an important place for private R&D, as the country hosts 46 R&D centres from Fortune 500 companies. The automotive industry in India is an example of a sector that, thanks to business-led innovation, has become competitive enough to export successfully to other regional markets. For example, the Indian automotive companies Mahindra & Mahindra and Tata Motors are major auto exporters. In addition to R&D facilities in India, both companies have additional research operations in Europe and Asia and are developing low-emission and electric vehicles for domestic and international markets (Mahindra, 2015; Tata Motors, 2015). The Indian government has also played an important role in supporting entrepreneurship through loans and collateral for innovative companies.

There are many different strategies that firms can implement to promote innovation, depending not only on their sector but also on the size and degree of internationalisation. However, in all cases, supporting innovation from the very early stages of development is a crucial factor. The composition of innovation financing in the private sector is undergoing structural changes. As explained above, Asian governments play an important role in national innovation strategies. Private investment is growing and gradually competing with public-sector programmes as the main source of finance for R&D projects. Seed funds also have proven to be particularly successful not only in financing start-ups but also in providing expertise in countries like Thailand, through the True Incube incubator, and in Singapore through Block 71, which provides co-working space to bring entrepreneurs together.

Public-private initiatives

Government incentives or support to the private sector can be imagined as a type of public-private collaboration. These partnerships can play an important role in national innovation strategies and policies.

Several Asian examples highlight public-private collaboration on innovation in action. In Chinese Taipei, the Industrial Technology Research Institute is the largest government-funded research institution and has played a crucial role in the formation of the private high-tech electronics industry. Several initiatives in the Philippines are supporting innovation and competitiveness. For example, the National Competitiveness Council is a special consultative platform supporting public-private dialogue to identify strategies enhancing the country's long-term competitiveness. Filipinos overseas have the potential to foster economic development and integration in the global economy through skills transfer, remittances and FDI. In India, public-private partnerships in the agribusiness sector are key for the development of an innovation ecosystem. Finally, Malaysia has partnerships through a series of programmes including the Public-Private Research Network, SIRIM-Fraunhofer and SME Masterplan: Inclusive Innovation.

The Chinese government has encouraged strongly the development of high-technology zones and incubators for private companies. Zhongguancun, in Beijing, was established by the Chinese State Council in the late 1980s as the country's first high-tech zone. Originally called the Beijing High-Technology Industry Development Experimental Zone, it has since been renamed the Zhongguancun Science & Technology Zone and features seven different technology parks. The Zhongguancun zone is known for its concentration of Chinese and international technology companies such as Baidu, Google and Lenovo and for producing a reported 49 new start-ups a day (Bloomberg News, 2015). China now has more than 1 600 technology incubators with more than 80 000 projects employing an estimated 1.75 million people (Yuan, 2015). The government also is promoting actively entrepreneurship and innovation by streamlining administration, strengthening regulation and improving services (Li, 2015).

PRIVATE SECTOR INSIGHTS ON INNOVATION CHALLENGES

A decision to invest in innovation will depend on costs, benefits and real or perceived risks. This section includes the insights drawn from the EMnet Asia meeting. Key challenges that companies report facing include lack of infrastructure, limited skills and financing gaps.

Enabling innovation through infrastructure investment

Lack of infrastructure is detrimental to economic growth prospects. In some Asian countries, businesses face recurring issues such as insufficient infrastructure in the mobile and Internet sectors. This situation hinders the innovation capacity of an economy and is viewed by the private sector as an area to be addressed as a top priority.

There are many business opportunities in the Asian infrastructure sector. For example, the Philippines need investors to develop infrastructure complying with more stringent environmental standards. Another option for Asian developing countries is to make use of the technological know-how of more advanced countries like, for instance, Israel, which has expertise in water innovation through integrated water resource management, reuse of treated effluents and seawater desalinisation.

Recommendations from the private sector include improving public-sector infrastructure research, developing public-private partnerships and improving infrastructure for energy transmission and distribution. Telecom-sector development is needed also where advanced technologies and mobile infrastructure can support innovation breakthroughs in Asia.

Skills strategies

The demand for skills for innovation projects varies across industries. Some multinational companies noted that they focus on recruiting local staff and develop the required skills internally. Others look at an international pool of candidates to identify and hire the best qualified workers. In particular, participants in the meeting discussed the situation of the financial sector, which is experiencing a brain drain towards the electronics and technology industries. To counteract this trend, the financial sector is currently trying to retain young talent through specialised programmes.

Education and skill formation also need to align with private-sector needs. For example, despite Japan's high position in Asian educational rankings, 83% of Japanese companies reported challenges in finding people with adequate skills when surveyed by ManpowerGroup (ManpowerGroup, 2015). During discussions, participants also noted that most Asian countries, with the exception of China, have limited industry-science linkages and low numbers of patent applications filed by national residents.

Financing innovation

Debt financing, loan guarantees and equity funding through venture capital have become popular instruments to finance innovation in emerging markets. For instance, the Indian government has played an important role in supporting entrepreneurship by providing loans and collateral for innovative companies. India in particular has promoted public-private partnerships in the agribusiness sector as a key part of its innovation strategy.

Participants stressed the need for the banking sector to move away from its traditional lending approach to address the fast-moving needs of corporate innovation. Financial institutions can support innovation through growth financing such as corporate finance, facilitating access to capital markets and providing intermediation for public-sector funds. Furthermore, access to finance for social innovation in rural areas is an important challenge in India and other Southeast Asia countries.

Financial sector actors also expressed concerns regarding the bankability of some early-stage innovation projects and suggested co-operative funding as a possible solution. In this setting, a public-private partnership may be a useful tool to unlock these innovative projects.

Increasing profitability through measures such as reducing energy expenditures is the main driver behind green innovation. However, green investments face several obstacles including market distortions created by public intervention and the decline of oil prices, which has reduced incentives to adopt alternative energy sources.

Governments also play a crucial role in securing credit flows for the private sector. Stable political and regulatory frameworks and solid macroeconomic fundamentals are essential to attract investors for large infrastructure projects. Public-sector reforms also are needed, particularly in the field of governance, budgeting and anti-corruption. This is illustrated by calls to foster improvements in investors' perception of regulatory frameworks (particularly those related

to the resource-based sectors in Indonesia). Furthermore, accelerating the integration of the ASEAN Economic Community is essential, as additional political and economic integration in the region would allow better co-ordination amongst suppliers, SMEs and multinational corporations.

The role of technology in fostering green innovation

Some Asian countries have started implementing greener innovation policies. For example, Indonesia aims to reduce fuel subsidies, while Malaysia's objective is to rationalise the use of subsidies. However, businesses stress that more progress is needed in this area.

Improving resource efficiency and data collection can help companies cut costs, improve business intelligence and mitigate risks. As noted at the EMnet meeting, greening operations in the airline industry could cut costs by 15 to 20%. The supply chain is increasingly based in Asia, and transforming production processes and supporting activities through incentives can improve aircraft usage and reduce costs. For an airplane, operational costs are much higher than its initial purchase, which represents only 20% of its cost. Innovative IT solutions, such as cloud technologies, can help companies such as retail businesses monitor sustainability data from multiple stakeholders and suppliers. The financial sector also is closely monitoring the potential long-term environmental impacts of their investments from a risk-management perspective.

THE WAY FORWARD FROM A BUSINESS PERSPECTIVE

Company size and degree of internationalisation are key factors shaping corporate innovation strategies. The private sector identifies and develops different innovation strategies based on the degree of internationalisation of operations and integration in regional and global value chains. In addition, participants also put special emphasis on "frugal innovation," i.e. providing solutions for improving the welfare of the low- and middle-income groups. In this regard, social enterprises are making significant progress in providing private-sector solutions to social problems faced by low-income groups.

Three main recommendations can be drawn from the EMnet Asia discussions to ensure local value creation and reinforce linkages with stakeholders across the value chain: strengthen public investments, encourage public-private partnerships for innovation in high-value sectors, and develop incentives for R&D.

Notes

1. In this chapter, Emerging Asia refers to the 10 ASEAN members states (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam) plus the People's Republic of China (hereafter "China") and India.
2. Southeast Asia includes ASEAN-10 and Timor-Leste.

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Chapter 3

Latin America: Boosting productivity through skills and innovation

Abstract

This edition of the EMnet Latin America Policy Note provides insights on the role the private sector can play to foster productivity through investment in skills and innovation. Improving productivity in Latin America will require aligning skills with market demand, leveraging foreign direct investment (FDI) to support innovation and expanding infrastructure investments. The note provides an overview of education and skills policies in Latin America, offers business insights on productivity-related challenges and assesses policy makers' efforts to support productivity improvements. The analysis builds on discussions at the business meeting held on 5 June 2015 at the French Ministries of Economy and Finance in Paris and organised by the OECD Emerging Markets Network (EMnet).

Key messages include:

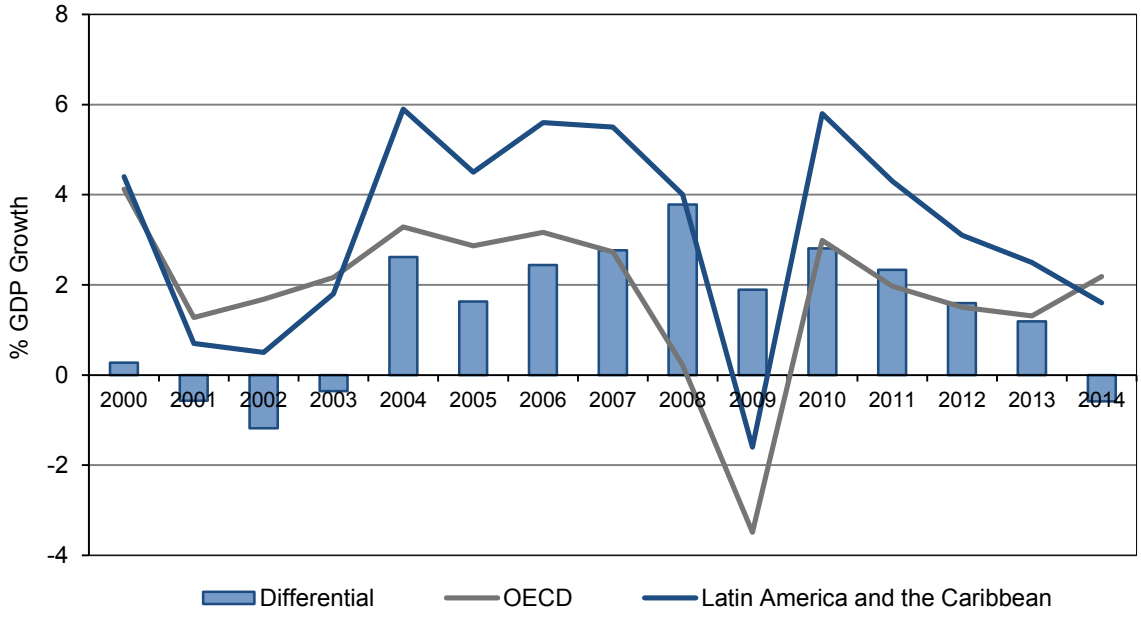
- Productivity improvements generated by investments in skills and innovation are essential to foster resilient long-term economic growth.
- Greater dialogue between educational institutions and the private sector is needed to address skills mismatch.
- Policies supporting foreign investment in research & development (R&D) are needed to encourage innovation spillovers and drive the growth of knowledge intensive industries.
- Education priorities can be further aligned with market demands for competencies such as English language skills.
- Facilitating the certification of training schemes developed by the private sector could encourage greater provision of corporate training to fill critical skills gaps.
- Developing institutional capacity and regional co-ordination to support investment in infrastructure development is necessary to unlock private capital flows.
- Greater use of debt capital markets can scale up finance for infrastructure. Firms are eager to see greater use of project bonds in the region.

BACKGROUND: LATIN AMERICA BUSINESS AND ECONOMIC OVERVIEW

The momentum of economic growth in Latin America and the Caribbean has been faltering since 2010. Like in 2014 and 2015, gross domestic product (GDP) growth in the region is projected to remain below the OECD average in 2016. In 2015, GDP in Latin America contracted by 0.3%, in sharp contrast to its 3.3% average annual growth rate of the previous decade. The region is expected to continue to struggle and grow below the OECD average in 2016, at -0.1% compared to 2.2% in the OECD economies.[1]

Latin America's GDP grew by only 1% in 2014, a weaker result than expected and well below the 5% growth rates of the 2000s (OECD, CAF and ECLAC, 2015). For the first time since 2003, growth in Latin America also has fallen below the OECD average (Figure 3.1). The *Latin America Economic Outlook 2016* attributes the slowdown to declines in commodity trade and overall external vulnerability (OECD, CAF and ECLAC, 2015).

Figure 3.1.**GDP growth in Latin America and the Caribbean and in the OECD**



Source: OECD, CAF and ECLAC (2014), *Latin American Economic Outlook 2015*, http://dx.doi.org/10.1787/leo-2015-en.

The regional average masks high heterogeneity amongst the countries. In 2016, economic growth rates in Panama (5.9%), Nicaragua (4.5%) and the Dominican Republic (4.9%) are projected to be considerably higher than the Latin American average. In contrast, Argentina (-0.1%), Brazil (between -3.1% and -4.0%), Ecuador (-0.1%) and Venezuela (-6.3%) will experience contraction. The remaining biggest economies in terms of GDP, such as Chile (2.0%), Colombia (2.5%), Mexico (2.7%) and Peru (3.3%), are expected to experience positive but moderate economic growth compared to the performance observed since 2005.[2]

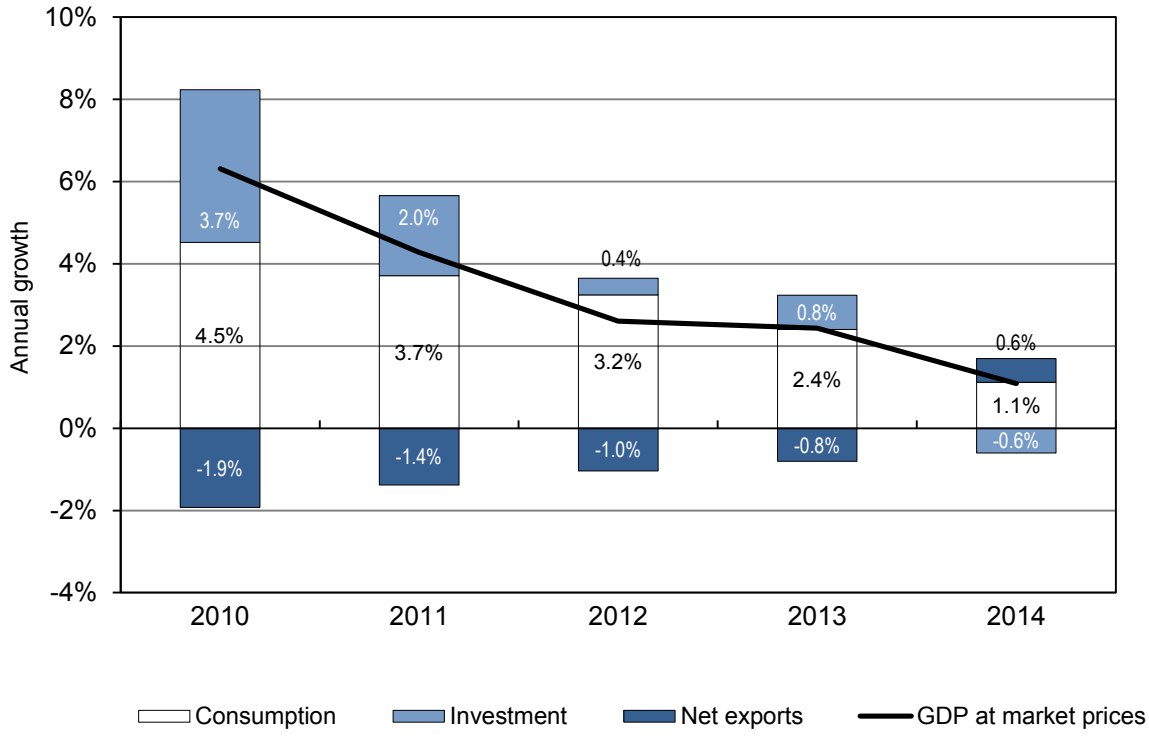
Manufacture exporters in Mexico and Central America that have integrated value chains with the United States are outperforming commodity exporters. Low commodity prices have hurt oil

and minerals exporters, but commodity exporters with strong monetary and fiscal frameworks such as Chile, Colombia and Peru are faring better than countries with weaker systems. Low oil prices are boosting growth prospects for energy-importing Central American and English-speaking Caribbean countries (OECD, CAF and ECLAC, 2015).

Loss of investment momentum

Following the 2008/09 global financial crisis, investment was an essential contributor to growth in Latin America. As shown in Figure 3.2., however, investment has been declining steadily since 2010, and by 2014 investment had become a negative contributor to regional growth (OECD, CAF and ECLAC, 2015).

Figure 3.2.**GDP growth in Latin America and contribution of the demand component**



Source: OECD, CAF and ECLAC (2015), *Latin American Economic Outlook 2016*, http://dx.doi.org/10.1787/9789264246218-en.

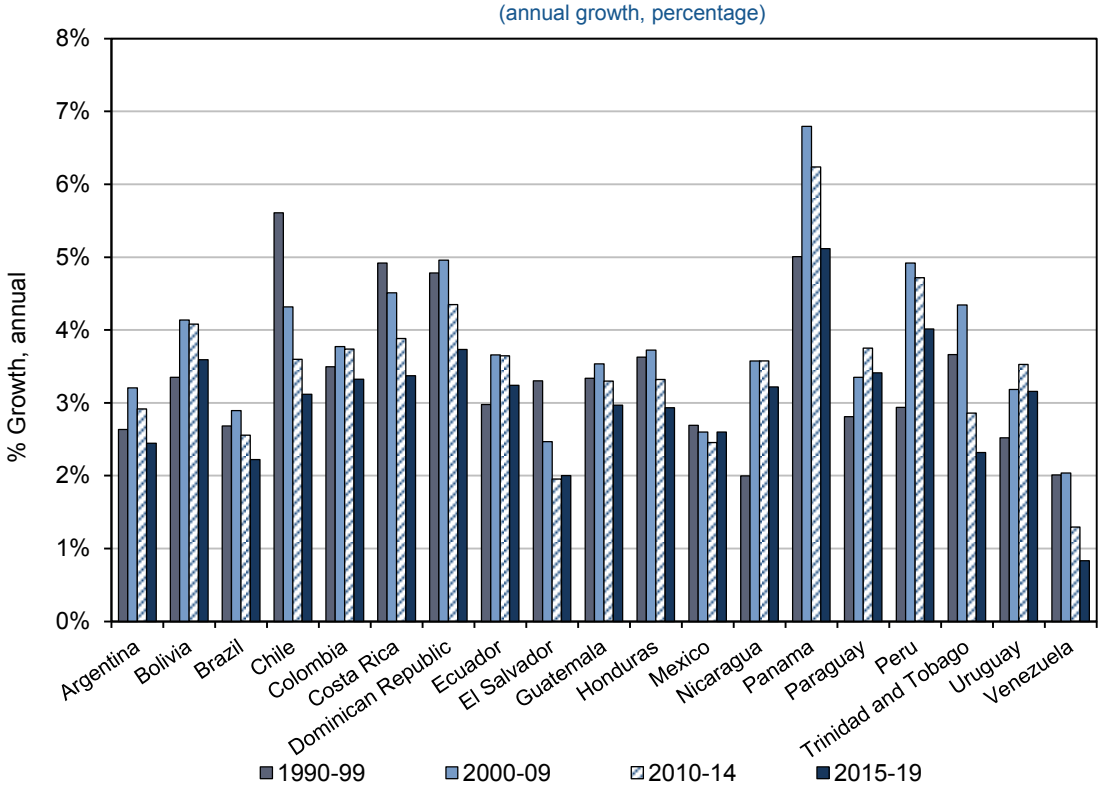
The decline in investment can be attributed to reduced overall demand, weakened commodity prices and more challenging financial conditions. In addition, reform bills and general policy uncertainty have led companies to defer investment in countries such as Argentina, Chile, Colombia, Ecuador, El Salvador and Venezuela (OECD, CAF and ECLAC, 2015).

A key concern is that the weak medium-term growth rates of around 3% for Latin America do not indicate a temporary slowdown, but rather highlight a situation of lower overall growth potential. Figure 3.3 underscores the decline in output growth across the region. Traditional

drivers of growth are fading in some middle-income countries, and new ways to boost productivity need to be identified.

Figure 3.3. **Trends in output growth in selected economies in Latin America**

(annual growth, percentage)



Source: OECD, CAF and ECLAC (2015), *Latin American Economic Outlook 2016*, http://dx.doi.org/10.1787/9789264246218-en.

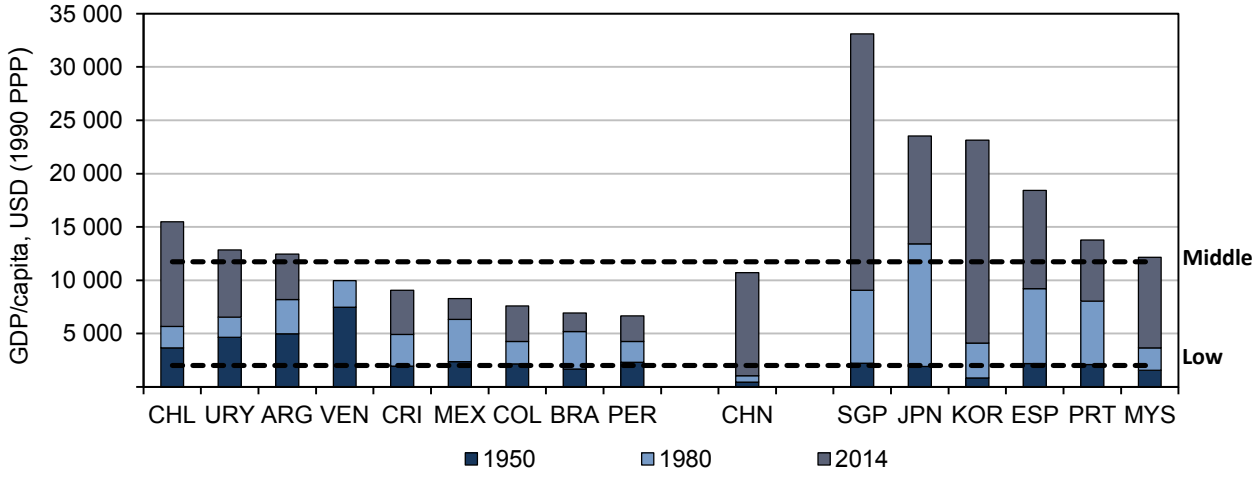
Furthermore, low growth figures, coupled with low productivity and widespread inequality, may be reasons to fear that some Latin American economies are entering the "middle-income trap" or will continue to remain constrained by it (see Box 3.1).

Box 3.1. The persistent middle-income trap in Latin America

As countries develop and accumulate increasing physical and human capital, productivity growth is essential to sustaining growth. The "middle-income trap" refers to a prolonged slowdown in GDP growth once an intermediate level of development has been reached. The middle-income trap is particularly persistent in Latin America and is fundamentally caused by the failure to transition from an economy based on industry to a knowledge- and innovation-based one. Investment in skills and innovation are hence key elements to promoting growth. As shown in Figure 3.4 below, unlike some Asian and European countries, Latin America has not made significant progress in closing the income gap with advanced economies. Only Chile, Uruguay and a few Caribbean countries are high-income countries in the Latin America region.

Sources: Solow (1956), "A Contribution to the Theory of Economic Growth", http://qje.oxfordjournals.org/content/70/1/65.abstract; Jankowska, Nagengast and Perea (2012), "The Middle-Income Trap", http://dx.doi.org/10.1787/5k8x7gwqsllp-en.

Figure 3.4. **The middle-income trap in Latin America vs. selected economies**

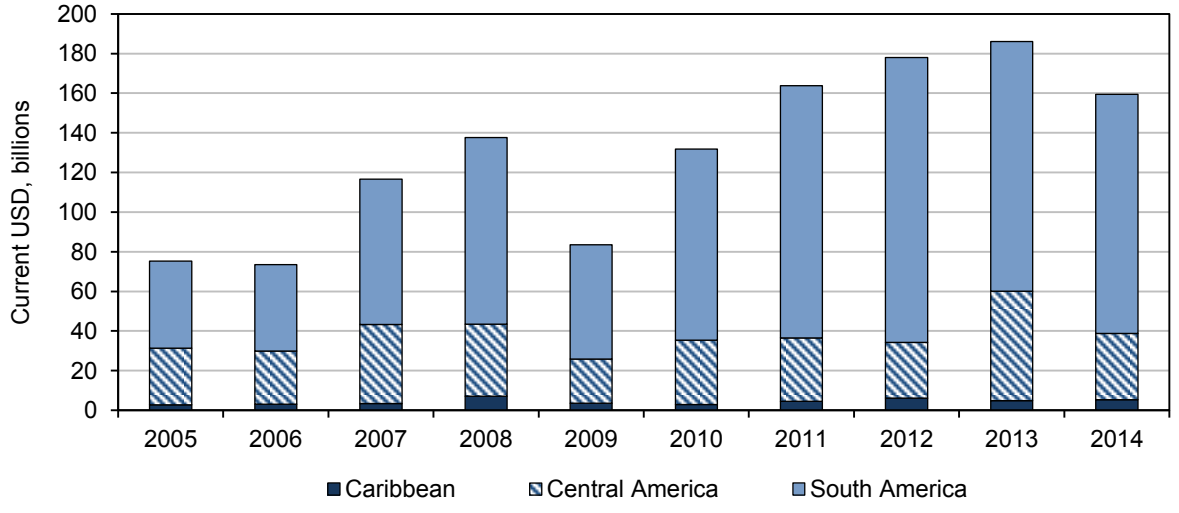


Note: GDP per capita at PPP in US dollars at constant 1990 prices.
Source: OECD, CAF and ECLAC (2015), *Latin American Economic Outlook 2016*, http://dx.doi.org/10.1787/9789264246218-en.

FDI trends

In 2014, total foreign direct investment (FDI) inflows to Latin America, amounting to approximately USD 160 billion, experienced a 16% slowdown compared to the previous year. FDI inflows were dominated by South America, followed by Central America and the Caribbean (Figure 3.5).

Figure 3.5. **Total FDI inflows to Latin America by year, 2005-14**

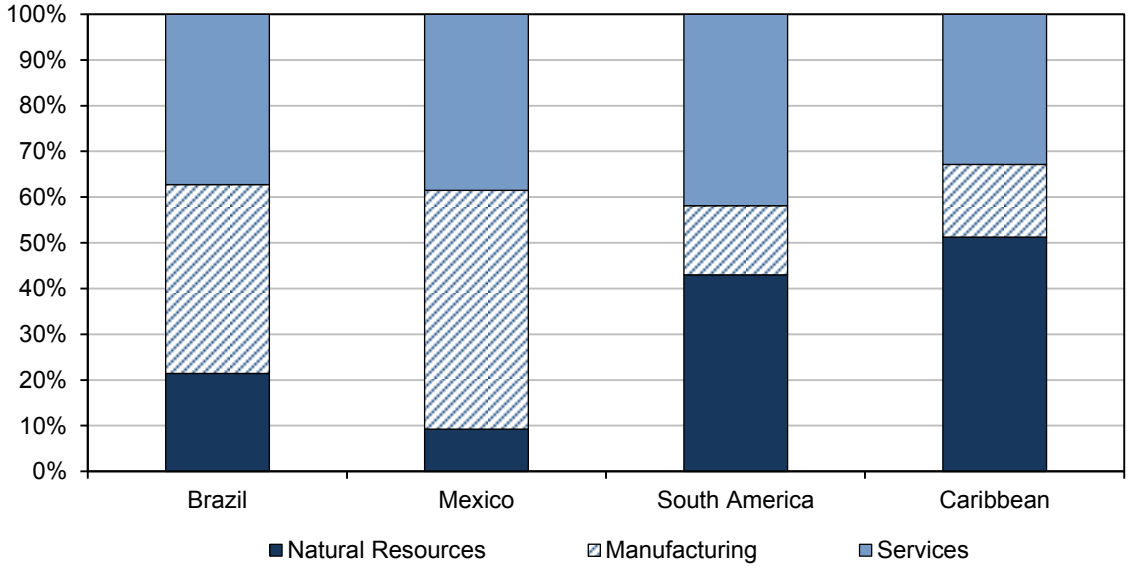


Note: USD at current prices and current exchange rates in billions, excluding the offshore financial centres in the Caribbean, namely Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, British Virgin Islands, Cayman Islands, Curaçao, Dominica, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Saint Martin (Dutch part), and Turks and Caicos Islands.
Source: UNCTAD (2015), UNCTADStat, http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=96740.

In terms of its composition, FDI in South America is focused mostly on extractive and natural resource industries, i.e. mining in Chile, Colombia and Peru, and hydrocarbons in Bolivia, Ecuador

and Venezuela (Figure 3.6). Similarly, the bulk of FDI in the Caribbean is concentrated on natural resources and extractive industries, i.e. oil and gas in Trinidad and Tobago, and mining in the Dominican Republic (ECLAC, 2015). Brazil and Mexico attract investment in manufacturing (automotive and electronics) and services. On average, services attract relatively more FDI inflows in the region, particularly telecommunications, financial services, energy distribution and retail.

Figure 3.6. **Total FDI inflows to Latin America by sector, 2009-13**

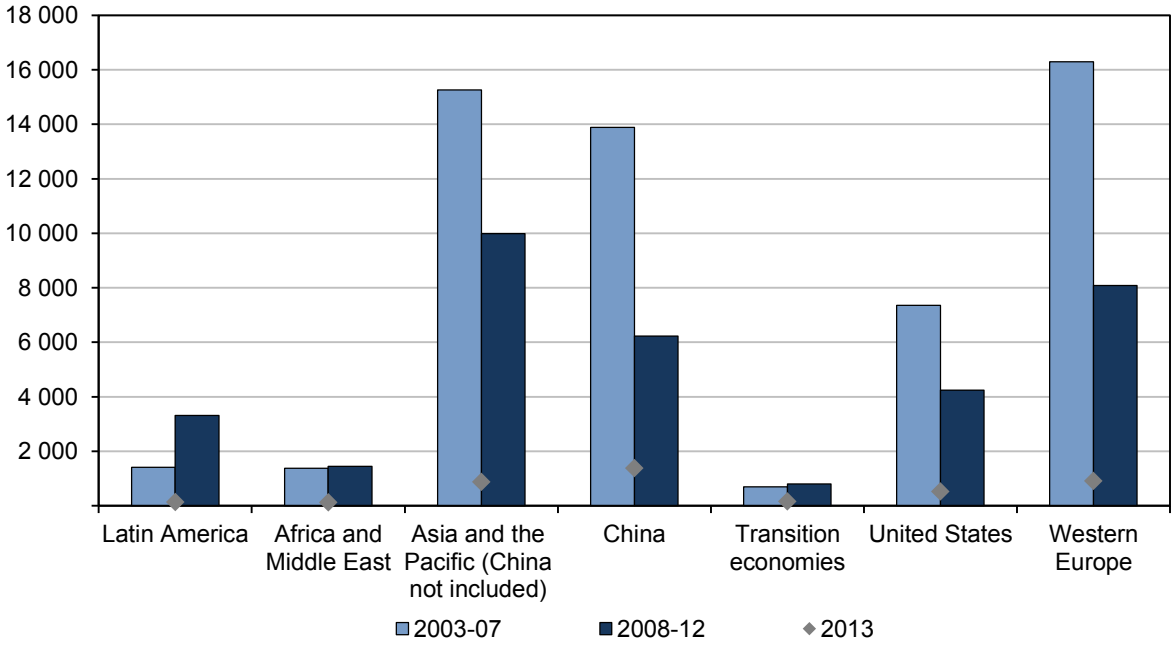


Note: South America comprises Argentina, Bolivia, Chile, Colombia, Ecuador and Uruguay. The Caribbean comprises the Dominican Republic and Trinidad and Tobago.
Source: OECD, CAF and ECLAC (2015), *Latin American Economic Outlook 2016*, http://dx.doi.org/10.1787/9789264246218-en.

FDI can also be a vehicle for innovation, providing new technologies and potentially generating spillovers. To achieve the greatest benefit, however, investment needs to take place in the most technology-intensive sectors and the beneficiary country needs an enabling environment that is well-connected with the rest of the local economy (OECD, CAF and ECLAC, 2015). As shown in Figure 3.6, manufacturing is a major area for investment in the region. Increased investment in the automotive industry since 2013, most prominently in Brazil and Mexico, has contributed particularly to technology-rich FDI inflows (OECD, CAF and ECLAC, 2014), but when manufacturing FDI goes into companies that are not linked with local firms or is only directed to low-value-added sectors, the chances of positive spillover effects are reduced significantly.

Finally, investment in research and development (R&D) can provide an indicator of a country's innovation landscape as well as highlight the relative role of technology in FDI. In absolute terms, Asia has performed far better than Latin America in attracting R&D FDI, benefiting from a steep rise, particularly from China, in R&D investment from multinational companies (Figure 3.7). The positive trend in Latin American R&D investment slowed in 2011, and it is unclear whether the past upward trend will return (OECD, CAF and ECLAC, 2014).

Figure 3.7. **Announced R&D projects, by period and region**



Source: OECD, CAF and ECLAC (2014), *Latin American Economic Outlook 2015*, http://dx.doi.org/10.1787/leo-2015-en, based on FDIMarkets.com (2014), Crossborder Investment Monitor, www.fdimarkets.com/explore/ (accessed May 2014).

Although there is considerable variation across countries, Latin American R&D projects received only a tiny share – on average less than 2% – of regional greenfield investment in 2003-13. Regional exceptions included Ecuador (4.5%), Costa Rica (3.8%) and Colombia (2.9%). These encouraging figures stand in sharp contrast with Korea, however, which had an average of 8% of greenfield FDI go into R&D between 2009 and 2013 (OECD, CAF and ECLAC, 2014).

Latin America is even further behind in job creation through FDI in R&D. Over the 2003-13 period, less than 3% of jobs in greenfield projects were in R&D fields. Colombia and Ecuador again led the region for the same period with about 5.5% of greenfield jobs in R&D, which is only about half of Korean levels (10.5%) (OECD, CAF and ECLAC, 2014). There is considerable work to be done to use FDI to provide more technology and skills in Latin America. Attracting FDI with a stronger R&D component will be essential to promote spillover effects on production processes and technology in destination countries.

EDUCATION, SKILLS AND INNOVATION FOR INCLUSIVE GROWTH

The development of human capital through skills and innovation is crucial for Latin America. Fostering innovation and improving education will be necessary to increase productivity and overcome the middle-income trap, strengthen the middle class and promote sustainable long-term growth (OECD, CAF and ECLAC, 2014).

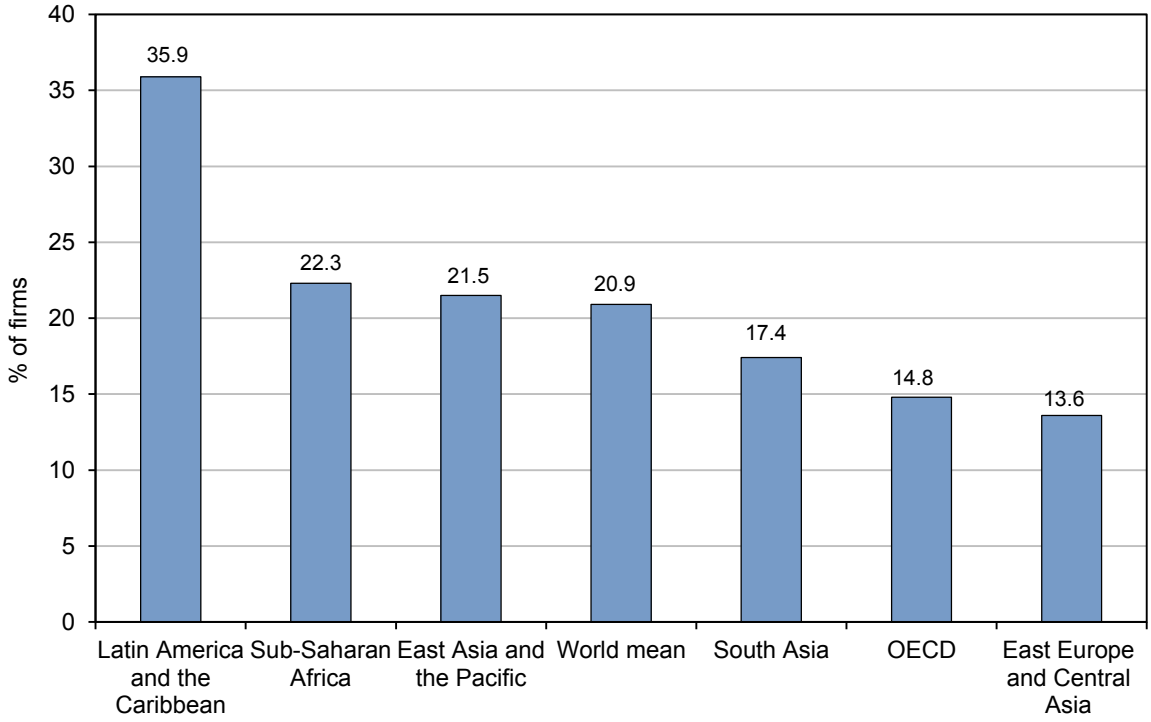
Educational challenges and developing skills

In Latin America there is a gap between the demand for skilled workers and the specific skills being taught by local educational institutions. Unequal access to education and a mismatch in skills requirements are key contributors to the educational gap in Latin America.

Latin America has increased investment in education but continues to face several challenges to improve its quality and effectiveness to close educational gaps. Access to primary education is practically universal and covers 91% of the population, compared to the 97% coverage rate in the OECD member countries as a whole (OECD, CAF and ECLAC, 2014). Access to pre-primary education, which plays a key role in a child's development, remains low, and dropout and repetition rates are still too high. The biggest challenge regarding access to education relates to socioeconomic, gender and urban-rural inequalities (OECD, CAF and ECLAC, 2014).

There is a mismatch between the skills required by the private sector and those possessed by workers. According to World Bank Enterprise Surveys (Figure 3.8), 36% of companies in the formal sector in Latin America struggled to find properly trained workers, compared to a global average of 21% and an OECD average of 15%. In addition, Latin American firms were three times more likely than South Asian firms and 13 times more likely than Pacific-Asian firms to face operational problems due to a lack of human capital (OECD, CAF and ECLAC, 2014). The automotive and machinery subsectors were affected most by these skills gaps. Entry-level vacancies can be particularly challenging to fill. A recent survey by McKinsey (Mourshed, Farrell and Barton, 2015) found that 48% of Brazilian employers and 40% of Mexican companies see lack of skills as the leading reason for vacancies.

Figure 3.8. **Percentage of firms identifying an inadequately educated workforce as a major constraint**



Note: Data are taken from the last available survey for each country. The countries included in the sample, by region, are:
- Sub-Saharan Africa: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Côte d'Ivoire, Cabo Verde, Chad, Congo, Democratic Republic of Congo, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Lesotho, Madagascar, Mali, Mauritania, Mauritius, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe;
- Latin America and the Caribbean: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago, Uruguay and Venezuela;
- East Asia and Pacific: Cambodia, China, Fiji, Indonesia, Laos, Malaysia, Micronesia, Myanmar, Mongolia, Philippines, Samoa, Thailand, Timor-Leste, Tonga, Vanuatu and Viet Nam;
- South Asia: Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka;
- East Europe and Central Asia: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Macedonia, Moldova, Montenegro, Romania, Serbia, Tajikistan, Turkey, Ukraine and Uzbekistan;
- OECD: Chile, Estonia, Germany, Greece, Ireland, Israel, Korea, Poland, Portugal, Slovak Republic, Slovenia and Spain.
Source: World Bank Enterprise Surveys (2012), World Bank, Washington DC, cited in OECD, CAF and ECLAC (2014), *Latin American Economic Outlook 2015*, http://dx.doi.org/10.1787/leo-2015-en.

Despite the unmet demand for skills, returns on education through wage premiums have fallen in Latin America since 2010 (OECD, CAF and ECLAC, 2014). The wage premium refers to the additional wages earned by workers with higher education versus the wages of those with less education. This decline could be explained by a wide variety of factors. For example, rapid increases in educational access could have diluted the quality of education. Outdated teaching methods and curricula, or the simple fact that the education system does not offer the skills most demanded by the labour market could also be playing a role. Additional formal employment and

stronger labour institutions supporting more stringently enforced minimum wages and effective collective bargaining are other potential contributing factors. OECD, CAF and ECLAC (2014) offers a more detailed literature review of recent wage-premium dynamics in Latin America.

The current state of innovation

To improve productivity, improvements in education also need to be supported by greater innovation. A range of indicators exist to measure innovation, such as patents for technology performance, R&D spending for technology inputs and innovation capital.

OECD studies on innovation across Latin America show that R&D spending has been considerably lower than that of OECD countries (e.g. Colombia, 2014; Peru, 2011; Mexico, 2009; and Chile, 2007). Moreover, as observed in other emerging markets, Latin American R&D is mainly driven by state funding. Transitioning to a knowledge-intensive economy and avoiding the middle-income trap will require Latin American countries to develop industrial and production development policies that will attract more high-tech FDI and put the newly educated labour force to work.

In 2013, patent registrations were also low in Latin America compared to OECD countries, and few countries in the region registered a significant number of patents with the United States Patent and Trademark Office. The same year, 132 patents per million inhabitants were registered on average in OECD member countries, versus 0.9 in Latin American countries (OECD, CAF and ECLAC, 2014).

Traditional ways of measuring innovation such as FDI and numbers of registered patents may not fully capture innovation efforts in developing countries. By using multiple proxies such as information and communications technology (ICT) infrastructure, R&D spending, patents, tertiary education and employee development, a broader indicator of “innovation capital” can be developed that measures the capacity to innovate and disseminate innovation (OECD, CAF and ECLAC, 2014). Based on a 2014 OECD analysis of innovation-capital proxies, the stock of innovation capital in Latin America is estimated to represent 13% of the economy on average, less than half of the stock in OECD countries (30%) (OECD, CAF and ECLAC, 2014). It is notable that tertiary education makes up most of the innovation-based capital stock in Latin America while R&D plays a relatively minor role. OECD countries, in contrast, invest significantly in R&D to drive innovation. Bolstering ties between higher-education institutions and the private sector in the science and technology fields is essential to improving the guidance and promotion of R&D activities. In addition, science and technology institutions need better governance for an efficient and comprehensive institutional framework to be developed to disseminate technology and innovation (OECD, CAF and ECLAC, 2014).

GOVERNMENT EFFORTS TO INCREASE PRODUCTIVITY

Governments have an important role to play in supporting productivity improvements. Implementing the right policies can boost productivity and set the economy on a path to development (OECD, 2014).

Government policies on education and skills

By promoting improved education and skills, governments can help to reduce inequality and support productivity improvements. Special attention can be given to the cases of Brazil and Mexico, the two largest economies of Latin America making strong progress in education. In 2012, Brazil and Mexico both allocated more than 17% of public expenditure to education, well above the OECD average of about 12% (OECD, 2015c). Brazil actively is implementing successful polices to improve the country's educational system. For example, Brazil's Bolsa Escola school-allowance programme and the national partnership to strengthen secondary education (Pacto Nacional pelo Fortalecimento do Ensino Médio) have reduced regional inequalities in access to education and in its performance (OECD, 2016b). The "University for All" programme, ProUni, promotes enrolment in tertiary education for low-income students and has been billed a success, awarding over 1.8 million scholarships between 2005 and 2013 (WEF, 2014b). In addition, the federal "Science Without Borders" programme supports international mobility for undergraduates, graduate students and researchers (WEF, 2014a).

Mexico has also implemented policies aimed at reducing inequality in access to education. In 2002, it made preschool education compulsory. The Oportunidades programme, which began in 2002, provides families with cash transfers conditioned on fulfilling certain aspects of education and health behaviour, such as regular school attendance and health-clinic visits. In 2014, the Mexican government announced that Oportunidades would be replaced by a new programme, "Prospera". Prospera complements cash transfers from Oportunidades by providing additional support to beneficiaries. For example, children can now receive scholarships for universities or technical schools, jobseekers will have priority in the National Employment Service and the programme will support access to financial education, savings, insurance and credit for beneficiaries (OECD, 2015b).

Skills policies also need to focus on strengthening the linkages between education and the labour market through technical training and apprenticeship. Vocational education and training (VET) systems are particularly important for responding to market needs and promoting work-based learning. A significant obstacle for Latin American VET systems is a lack of training amongst the teaching staff at institutions in charge of delivering the VET competency-based curriculum (IVETA, 2015). As a response, Brazil has adopted the Profuncionario training programme for education staff, and Peru has introduced an incentive mechanism to recognise teachers' performance (OECD, 2016b).

Apprenticeship can also give workers a better start in their careers. Available evidence highlights the positive experience of some Latin American countries in this domain, notably in Argentina and Mexico, where apprenticeship completion rates reach about 80% (OECD, 2016b). Involving employers is a crucial element for the success of apprenticeship programmes. In Brazil, the Aprendiz Legal apprenticeship programme is based on a legal requirement for firms to hire apprentices and has been successful in expanding the number of apprenticeships (OECD, 2016b). In Latin America, work schemes and training programmes can complement apprenticeship. The BECATE programme in Mexico and the Joven programmes in Chile,

Argentina and Colombia combine education, job training and internships. These programmes have been shown overall to have a positive impact on labour-market formality (OECD, 2016b).

Promoting effective innovation policies

Innovation will also play an important role in increasing the productivity gap in the region. In the 2000s, Latin American countries undertook major reforms and worked to build institutions to coordinate, manage and promote science, technology and innovation (OECD, CAF and ECLAC, 2014). For example, Latin American countries took steps to formalise and increase the political weight of research, science and technology institutions; Argentina, Brazil and Costa Rica established ministries of science, technology and innovation; and Uruguay created a ministerial cabinet for innovation (Gabinete Ministerial de Innovación) and a national agency for research and innovation (Agencia Nacional de Investigación e Innovación) (Rivas and Rovira, 2014).

Brazil is recognised as a leader in the region for its integrated public-innovation policy with a variety of channels that interact with each other. For example, Brazil set up a special agency for strategic studies and management (Centro de Gestão e Estudos Estratégicos) combined with the development of national science and technology plans and periodic information-gathering efforts on innovation activities (Rivas and Rovira, 2014). Linking together these three areas highlights efforts to promote greater coherence across policies. Brazil has also established sector-specific funds that are recognised as a key instrument to support innovation at the national level (Rivas and Rovira, 2014).

Chile has made efforts to support innovation at the subnational level. Set up in 2001, Innova Bio was the first regional fund for technological innovation in Chile and highlights a decentralised approach to support innovation. Chile is also developing strategic programmes (Programas Estratégicos) that foster public-private co-ordination in sectors with high growth potential such as aquaculture, logistics and tourism, and could help to foster the emergence of clusters (OECD, 2015a).

PRIVATE SECTOR INSIGHTS ON PRODUCTIVITY CHALLENGES

Improving productivity in Latin America will require aligning skills with market demand, leveraging FDI to support innovation and expanding infrastructure investments. This section includes insights drawn from the EMnet Latin American meeting in June 2015.

Participants expressed the need for Latin American governments to focus on developing knowledge-based societies capable of transitioning to a high-income status and avoiding the middle-income trap. Participants stressed the importance, in the short run, of rebuilding monetary and fiscal response capacities in Latin America to counter the challenging economic context and stabilise the overall macroeconomic environment. In the long term, however, Latin America needs to move forward in implementing structural reforms to boost potential growth and equality.

Aligning education and skills with market demands

Governments should align education priorities with market demand for skills. English and other foreign-language skills are particularly valued by companies. Latin American countries should also implement vocational programmes that equip those who decide not to pursue tertiary education with the right skills. In some cases, companies are developing their own internal training programmes and academies to fill skills gaps. Companies noted that when they try to certify these

training programmes with local and national governments they often have faced long bureaucratic procedures that delay the recognition of the skills acquired by workers.

The case of Costa Rica shows that it is possible to narrow the skills gap, with the private sector contributing to strengthen skills, improve education opportunities and achieve one of the highest literacy rates in the region. Private companies in Costa Rica partnered with national universities and the National Institute for Learning (Instituto Nacional de Aprendizaje) to improve their curricula, favour onsite learning, and provide cutting-edge targeted training in semiconductor manufacturing and microelectronics (OECD, 2012). Box 3.2 provides additional examples of successful public-private partnerships for education.

Box 3.2. Public-private partnerships for education and skills in Latin America

Programa Universidade para Todos (ProUni), or "University for All", is a programme initiated by the Brazilian government to promote access to private tertiary education for low-income students. The programme awards scholarships ranging from 25% to 100% of the tuition costs for eligible students. The goal is to increase the share of students enrolled in tertiary education from under 15% to 33% by 2020, in line with the national education plan (PNE). In Brazil, nine out of 10 universities in the country are private where, however, 37.5% of the places are not filled, compared to 5% at public schools. The government decided to partner with private universities to capitalise on their excess capacity, and in exchange for their participation, universities receive tax exemptions. The programme has been billed a success, awarding more than 1.8 million scholarships from 2005 to 2013, 57% of which were full scholarships.

Empresarios por la Educación (ExE), or "Business for Education", is a programme started by the Colombian Ministry of Education to involve the domestic private sector in shaping and improving the educational system. Although Colombia has achieved a high enrolment rate for primary school, important deficiencies in the quality of the education persist. By involving the business community, the ministry hopes to improve educational quality. Some of the actions taken by the private sector include developing training for educators in better school-management practices and assisting with programme monitoring and evaluation. Programme funding comes both from private-sector companies, foundations and other national or international co-operation partnerships.

Source: WEF (2014b), Creating New Models, www3.weforum.org/docs/GAC/2014/WEF_GAC_LatinAmerica_Innovative_PublicPrivatePartnerships_Report_2014.pdf.

Companies are employing different hiring strategies to respond to skills gaps. Businesses that set up a new subsidiary abroad have the options of sending staff as expatriates from their headquarters or hiring qualified workers locally. Alternatively, others prefer to purchase a local existing company and retain the local staff to leverage their market knowledge and experience. International firms, however, have highlighted the difficulties they can face in integrating different corporate working cultures within a single company.

Leveraging FDI to support innovation and improve productivity

Additional investment in information technologies and telecommunications will be needed particularly to increase productivity and support innovation (OECD, 2016b). By encouraging needed FDI, countries can promote economic development, improve business practices and generate jobs. FDI investment in enabling infrastructure such as high-speed broadband coverage can play a powerful role in stimulating future innovation. Countries should put greater emphasis

on attracting FDI with R&D components to promote production-process and technology spillovers in destination countries.

Participating companies stressed the important role of proactive investment promotion and facilitation policies that go beyond simply providing tax incentives. While tax rates are an important consideration, low tax rates are not necessarily more attractive for companies. For example, effective government communication regarding fiscal expenditures can increase investor confidence. Taxes in Chile, for instance, are perceived to be high but fair, as the government effectively communicates public investment achievements. Peru, in contrast, has lower tax rates, but investors have a much more cautious outlook regarding the country's fiscal capacities and ability to communicate progress.

Expanding infrastructure investments

If Latin America were to close its infrastructure gap with other middle-income countries, the region could increase its annual growth by an estimated 2 percentage points (Calderón and Servén, 2010). Given that fiscal and monetary policy tools are almost exhausted, infrastructure investments are needed critically to increase business and workforce productivity. Despite the infrastructure needs, Latin America is experiencing an "infrastructure paradox," namely that many investments are required yet investment opportunities with attractive risk-adjusted returns for private investors are limited. Developing institutional capacity and regional co-ordination to support investment in infrastructure development is necessary to unlock capital flows into infrastructure projects. To improve project sustainability, participants also underscored the importance of local "buy in" and consensus regarding the value of infrastructure projects.

Infrastructure finance can also be further modernised through greater use of debt capital markets. Project bonds, i.e. bonds directly linked to specific infrastructure projects, are another tool available to Latin American governments to finance infrastructure. Companies are eager to see greater use of project bonds in the region.

THE WAY FORWARD FROM A BUSINESS PERSPECTIVE

The economic slowdown of Latin America should be a wakeup call for Latin American policy makers to address education and innovation gaps. Participants highlighted the advantages and drawbacks of several Latin American economies. Colombia was universally perceived as one of the most business-friendly countries in Latin America. Proactive investment promotion and facilitation policies are important and should be designed to support innovation policies. Colombia and Peru are perceived to be lagging behind Chile in logistics and infrastructure capacity. In Brazil, investors face major legal and regulatory challenges in establishing production facilities.

To address skills mismatch, greater public-private co-operation is needed. For example, facilitating certification of private training schemes could encourage greater private-sector provision of training to fill critical skills gaps. Supportive policies for FDI in R&D are needed to promote innovation spillovers. Latin America remains constrained by infrastructure deficiencies, and greater regional co-ordination and institutional capacity are needed to unlock needed infrastructure investment.

Notes

1. The average growth rate of Latin America in 2005-15 is from *CEPALSTAT* (CEPAL, 2016). Latin America 2016 growth forecasts are sourced from the February 2016 Consensus Forecasts (Consensus Economics, 2016). OECD growth rates and projections are drawn from the OECD Interim Economic Outlook (OECD, 2016a).
2. Latin America growth forecasts for 2016 are sourced from the February 2016 Consensus Forecasts (Consensus Economics, 2016). For Brazil, the 2016 -3.1% growth forecast is drawn from the February 2016 Consensus Forecasts and the -4.0% growth forecast is from the OECD Interim Economic Outlook (OECD, 2016a).

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Chapter 4

Betting on a growing market: Urbanisation, demographic boom and opportunities in Africa

Abstract

This edition of the EMnet Africa Policy Note identifies opportunities and challenges for the private sector associated with demographic growth, urbanisation and regional integration in Africa. The analysis builds on discussions at the business meeting held on 6 October 2015 at the OECD headquarters in Paris and organised by the OECD Emerging Markets Network (EMnet).

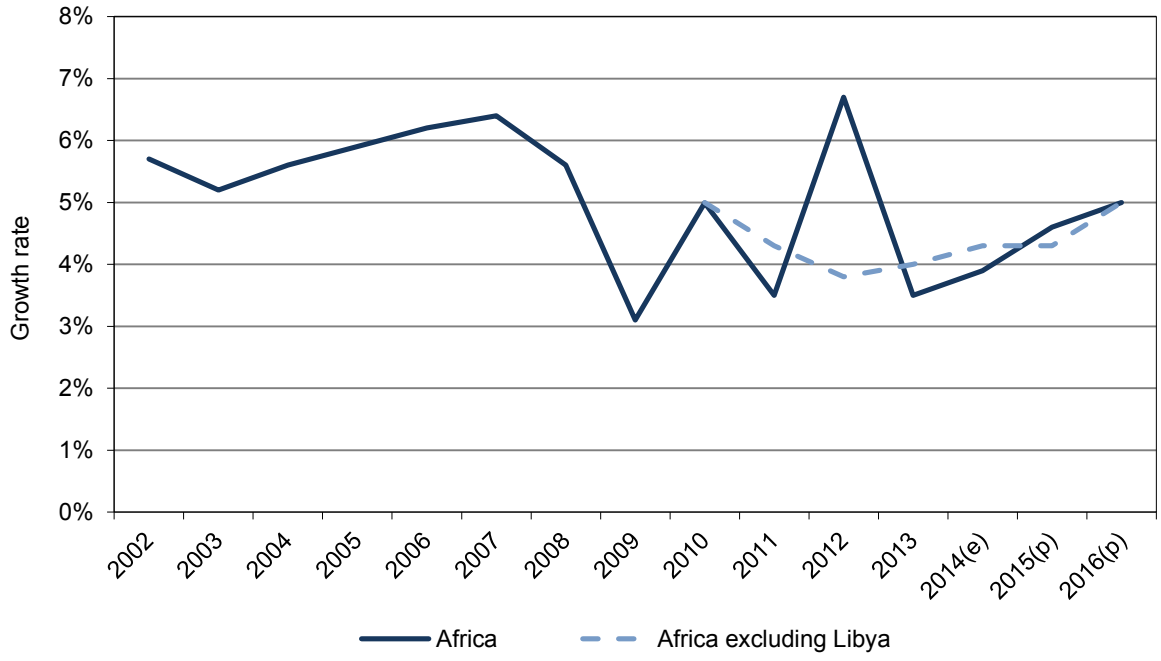
Key messages include:

- Africa is experiencing unprecedented demographic growth that is opening up new investment opportunities in sectors outside the traditional extractive industries.
- Population growth and urbanisation offer opportunities to develop new products and services tailored to urban dwellers and the middle class.
- A growing domestic energy demand is capturing the interest of the multinational companies in Africa; however, the lack of skilled labour and the complexity of land ownership risk slowing down investments.
- Limited regional integration presents a major challenge for development and is particularly crucial to promote industrialisation and energy markets.
- Quality public policies and a strong commitment from all levels of governments are essential to develop public-private partnerships that can support infrastructure and industrial development.
- Clusters, sectoral zones and development of “corridors” can be powerful tools to promote industrialisation and regional integration.
- Local expertise is particularly important to develop productive relationships with local governments and gain a better understanding of customers and investors.

AFRICA'S BUSINESS AND ECONOMIC OVERVIEW

According to the *African Economic Outlook 2015*, gross domestic product (GDP) in Africa should increase to 4.5% in 2015 and medium-term growth prospects are more favourable than in past decades, despite some signs of volatility (Figure 4.1).

Figure 4.1. **Africa's economic growth, 2002-2016**



Note: (e) estimate; (p) projections.
Source: Statistics Department, African Development Bank, cited in AfDB/OECD/UNDP (2015), *African Economic Outlook 2015*, http://dx.doi.org/10.1787/aeo-2015-en.

Such volatility can be explained by an uncertain global economic recovery and political instability in some African countries such as Libya or South Sudan. However, significant additional risks could further threaten growth and increase volatility. Low commodity prices, declines in global demand, difficult financing conditions and electricity shortages all give reason for caution (IMF, 2015). For example, while oil-importing countries are benefiting from lower oil prices, the significant declines in commodity exports are exceeding these gains. Oil-exporting countries are particularly hard hit by the falling export incomes. Additional factors, such as the uncertainty regarding the Chinese slowdown contribute to additional potential variation in economic performance. Unless otherwise noted, data in this section are drawn from the *African Economic Outlook 2015 (*AfDB/OECD/UNDP, 2015).

A more diversified growth

African countries are moving towards more diversified economies. From the demand side, private consumption and public infrastructure investment are the main GDP contributors. The following industries were key drivers of 2014 GDP growth:

- **Agricultural sectors** recorded high production levels due to good weather.
- **Construction** increased its share of GDP through significant expansion of infrastructure and housing investment.
- **Services**, including both information and telecommunication technologies and traditional industries such as trade and real estate, performed better than expected.
- **Extractive industries** continued to drive growth despite commodity price declines.

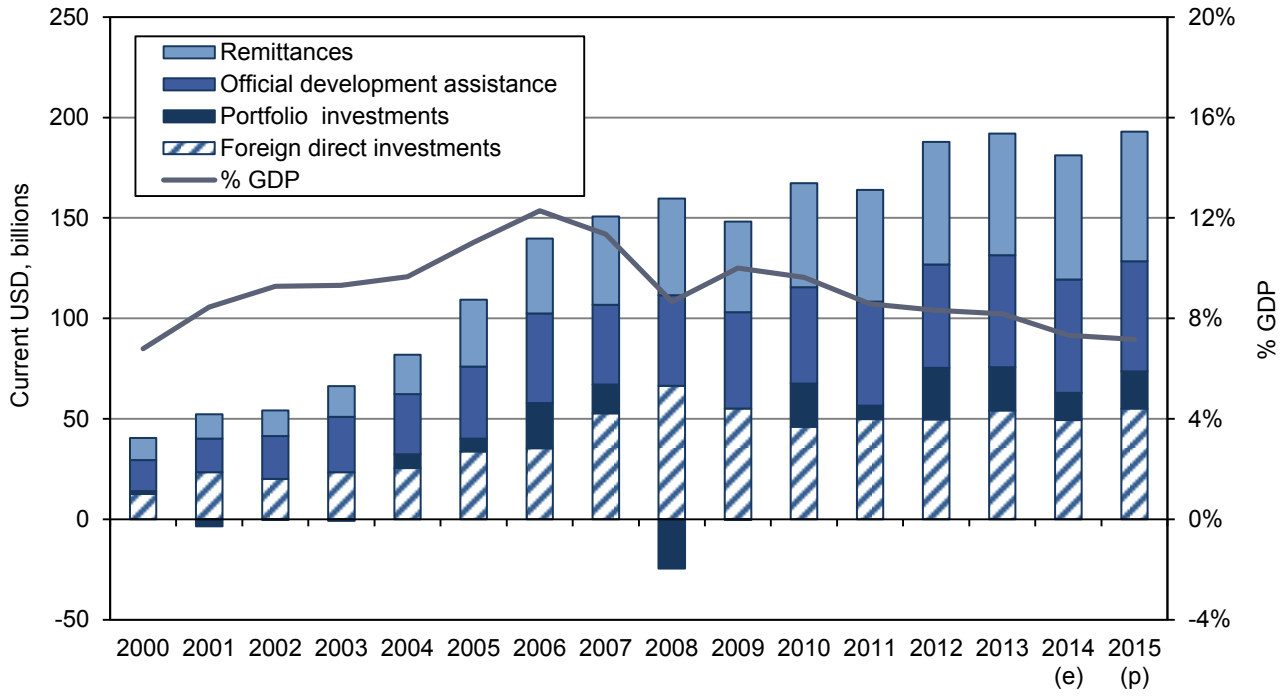
Africa's economic performance is heterogeneous and specific countries are best studied individually. However, at the regional level, sub-Saharan Africa is driving GDP growth, with the exception of South Africa. North African growth, although very sensitive to the situation in Libya, has also been performing relatively well.

The fall of oil prices had mixed effects on African economies. Oil-producing countries have shown resilience despite the fall in government revenues. However, if oil prices remain low, governments may reduce expenditures, which could negatively affect medium-term economic prospects. On the other hand, lower oil prices are having positive effects for oil importers such as Côte d'Ivoire and Ghana. Lower energy costs are boosting internal demand and increasing disposable income for households.

FDI is starting to recover

Foreign direct investment (FDI) into Africa is starting to recover from the global financial crisis, reaching an estimated USD 181 billion in 2014 (see Figure 4.2). Before the 2008 crisis, FDI was the main capital flow to the continent. Although FDI inflows declined in subsequent years, recovery is expected. By 2016, FDI should retake its position as the main source of financial flows. Official development assistance has been holding steady in recent years. However, a decline in official development assistance from USD 56.3 billion in 2014 to a projected USD 54.9 billion in 2015 is expected. Moreover, net capital inflows as a share of GDP, as shown by the line in Figure 4.2, have been steadily decreasing, indicating that Africa is relying less on external lending.

Figure 4.2. **External financial flows to Africa, 2000-15**



Note: ODA (e) estimates and (p) projections based on the real increase of Country Programmable Aid (CPA) in OECD (2014b). The forecast for remittances is based on the projected rate of growth according to the World Bank. This graph excludes loans from commercial banks, official loans and trade credits.
Source: AfDB/OECD/UNDP (2015), *African Economic Outlook 2015,* http://dx.doi.org/10.1787/aeo-2015-en.

Africa remains a frontier for foreign investment. Africa's share of global FDI was 5.7% in 2014, its highest level in ten years. Investment flows are shifting from extractive industries towards more consumer-oriented sectors. Foreign investment is also targeting large African urban centres, driven by a growing demand from the middle class. From a country perspective, Egypt, Mozambique, Morocco, South Africa, the Republic of the Congo (hereafter, Congo) and Ghana received the most FDI inflows in 2014 (AfDB/OECD/UNDP, 2015). Main sectors for investment are highlighted in Table 4.1 below.

Table 4.1.**Top destinations in Africa of foreign direct investment, by value of investment (2014)**

Country	Value (USD billions)	Main Sectors
Egypt	5.5	Oil, gas, automotive
Mozambique	4.9	Infrastructure, gas
Morocco	4.7	Manufacturing, real estate, food processing
South Africa	4.2	Infrastructure
Congo	2.8	Oil
Ghana	2.7	Information and Communication Technologies (ICT), retail

Source: AfDB/OECD/UNDP (2015), *African Economic Outlook 2015,* http://dx.doi.org/10.1787/aeo-2015-en.

Reflecting the shift towards consumer goods, Kenya, the Republic of Tanzania, Uganda and Zambia are also attracting increased investor interest. At the regional level, East Africa's overall FDI grew by 9%, while West Africa's suffered a drop of 20% caused by political and security instability in Nigeria and the Ebola outbreak. Although Southern Africa FDI declined by 20%, this reflects a return to normal levels after exceptionally high 2013 inflows. FDI into North and Central Africa decreased marginally (AfDB/OECD/UNDP, 2015).

Box 4.1. Banking industry driving intra-African FDI

Intra-African FDI flows have been on the rise since 2010, and African commercial banks are driving the investment trends with extensive regional expansion.

Ecobank, a commercial bank headquartered in Lomé, Togo, was initiated by the Federation of West African Chambers of Commerce & Industry with the support of the Economic Community of West African States (ECOWAS) in 1984 and aims to become the leading pan-African bank. Since 2007, it has started expanding outside the ECOWAS region, reaching a total of 36 African countries, more than any other bank in the world. Currently, the group has over 9.6 million customers, 1 200 branches and is the largest financial-sector employer in Central Africa.

FirstRand, a South African-based bank, and the fourth largest bank in Africa according to total assets, is also expanding its operations beyond the domestic market. The bank seeks to strengthen its position as a South African player while expanding operations in key African markets, particularly in Southern and East Africa.

Standard Bank, another South African bank, is expanding its operations to other African regions. In 2013, the bank opened a representative office in Abidjan, Côte d'Ivoire. Standard Bank sees the West African region as a key growth opportunity. In 2014, it opened offices in Benin, Mali, Senegal, Niger, Togo and Guinea Bissau as part of its West African growth strategy. In 2015, the group consolidated its East African presence by opening a representative office in Addis Ababa, Ethiopia. Standard Bank, Africa's largest bank by assets, now has a continent-wide presence in 20 African countries. Further expansion is planned for operations in Gabon, Cameroon, the Central African Republic, Chad, Congo and Equatorial Guinea.

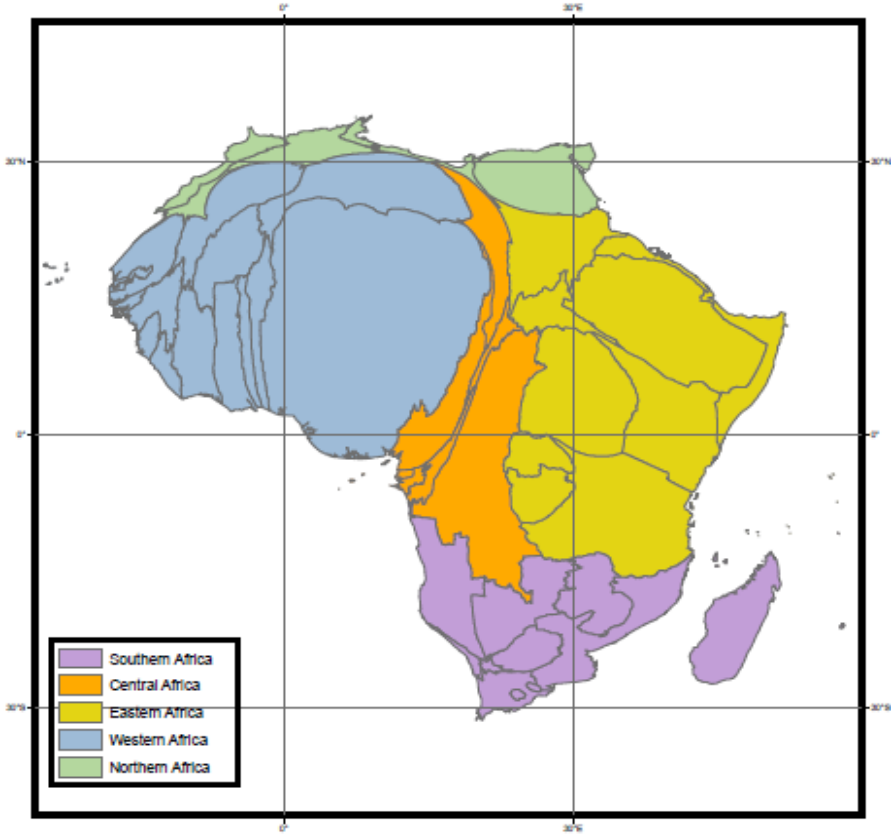
Sources: Standard Bank (2015a), "Standard Bank Group continues steady growth", www.standardbank.com/pages/StandardBankGroup/web/newsArticle/2015/NewsArticle-5Mar2015.html; Standard Bank (2015b), "Standard Bank consolidates its East African presence", www.standardbank.com/standardbank/About-Us/Media-releases/News/Standard-Bank-consolidates-its-East-African-presence-with-official-opening-of-Ethiopian-representative-office; Standard Bank (2014), "Greenfields investments to stimulate infrastructure capacity", www.thenigerianvoice.com/news/145164/1/greenfields-investments-to-stimulate-infrastructur.html; Standard Bank (2013), "Standard Bank Group expands", www.stanbicibtcbank.com/standimg/Mauritius/fileDownload/StandardBankExpandsItsAfricaFootprint.pdf; The Africa Report (2013), "Top 200 Banks 2013", www.theafricareport.com/Top-200-Banks/top-200-banks-2013.html; Ecobank (n.d.), About Us, www.ecobank.com/group/aboutus.aspx.

Prospects for African FDI outflows are optimistic. Intra-African FDI increased from 11% of total FDI during 2003-08 to 19% during 2009-2014 (fDiMarkets.com, n.d.). Africa's FDI outflows rose from USD 8.1 billion in 2011-2012 to USD 11.4 billion in 2013-2014. Outflows should increase further in 2016, but the fall of commodity prices and political instability may put downward pressure on investment.

DEMOGRAPHIC BOOM: OPPORTUNITIES AND CHALLENGES FOR BUSINESSES

Africa is experiencing unprecedented demographic growth. By 2050, the continent's population will have increased to over 2 billion, accounting for 25% of the world's population, compared to 15% today. In addition, the continent should have more cities of 1 million inhabitants than India or the United States by 2050 (AfDB/OECD/UNDP, 2015). At the regional level, population growth will be uneven amongst African regions, with East and West Africa experiencing most growth (see Figures 4.3 and 4.4). Rural communities will also continue to grow but at a slower rate than cities. Until the mid-2030s, the majority of Africa's population will likely live in rural areas (AfDB/OECD/UNDP, 2015).

Figure 4.3. **Africa's weighted population, 2050**

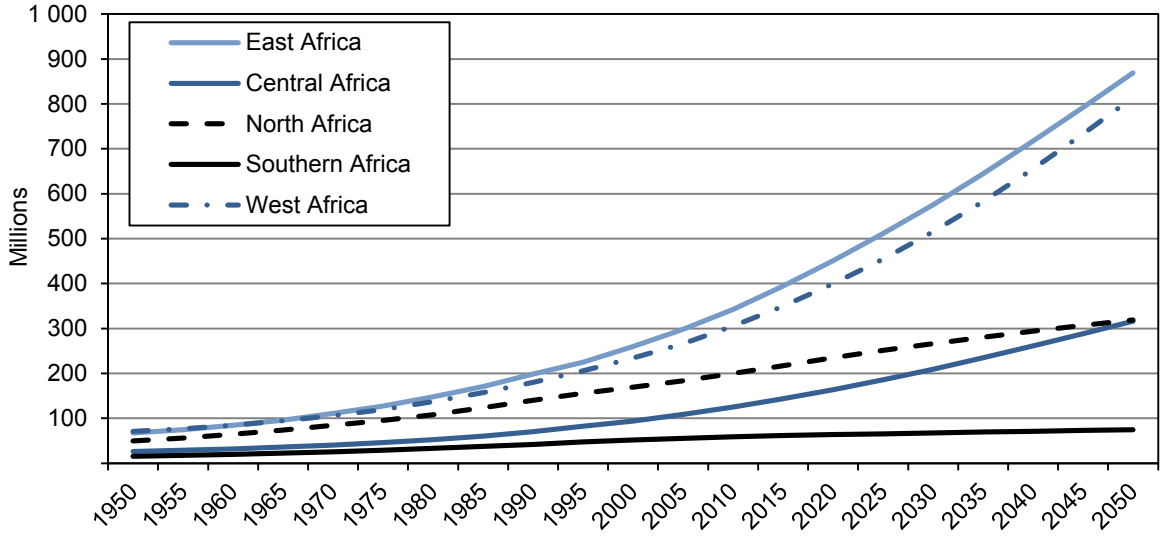


Sources: UNDESA (2012), *World Population Prospects*, http://esa.un.org/unpd/wpp/Publications/Files/WPP2012_Volume-II-Demographic-Profiles.pdf and CIRAD Cartography Unit, cited in AfDB/OECD/UNDP (2015), *African Economic Outlook 2015*, http://dx.doi.org/10.1787/aeo-2015-en.

A new middle class emerges

Africa's middle class tripled over the last 30 years to reach 355 million in 2011, representing 34.3% of the population (AfDB, 2011). The African middle class is expected to grow to 1.1 billion, representing around 42% of the total population by 2060 (AfDB, 2011). The increase in the middle class may shift foreign direct investment further from traditional sectors such as extractive industries to the retail sector, notably consumer goods and services (AfDB/OECD/UNDP, 2015).

Figure 4.4. **Population growth in Africa, 1950-2050**



Note: Medium fertility scenario
Source: UNDESA (2012), *World Population Prospects*, http://esa.un.org/unpd/wpp/Publications/Files/WPP2012_Volume-II-Demographic-Profiles.pdf cited in AfDB/OECD/UNDP (2015), *African Economic Outlook 2015*, http://dx.doi.org/10.1787/aeo-2015-en.

In line with the demographic changes, Africa's workforce is expected to increase by 910 million people between 2010 and 2050, 90% of whom will be in sub-Saharan Africa and the other 10% in North Africa. This increase represents two-thirds of the expected total increase in the workforce worldwide (AfDB/OECD/UNDP, 2015). The demographic shift in Africa will have consequences in many areas, including energy infrastructure, urbanisation, industrialisation and regional integration, and risk management.

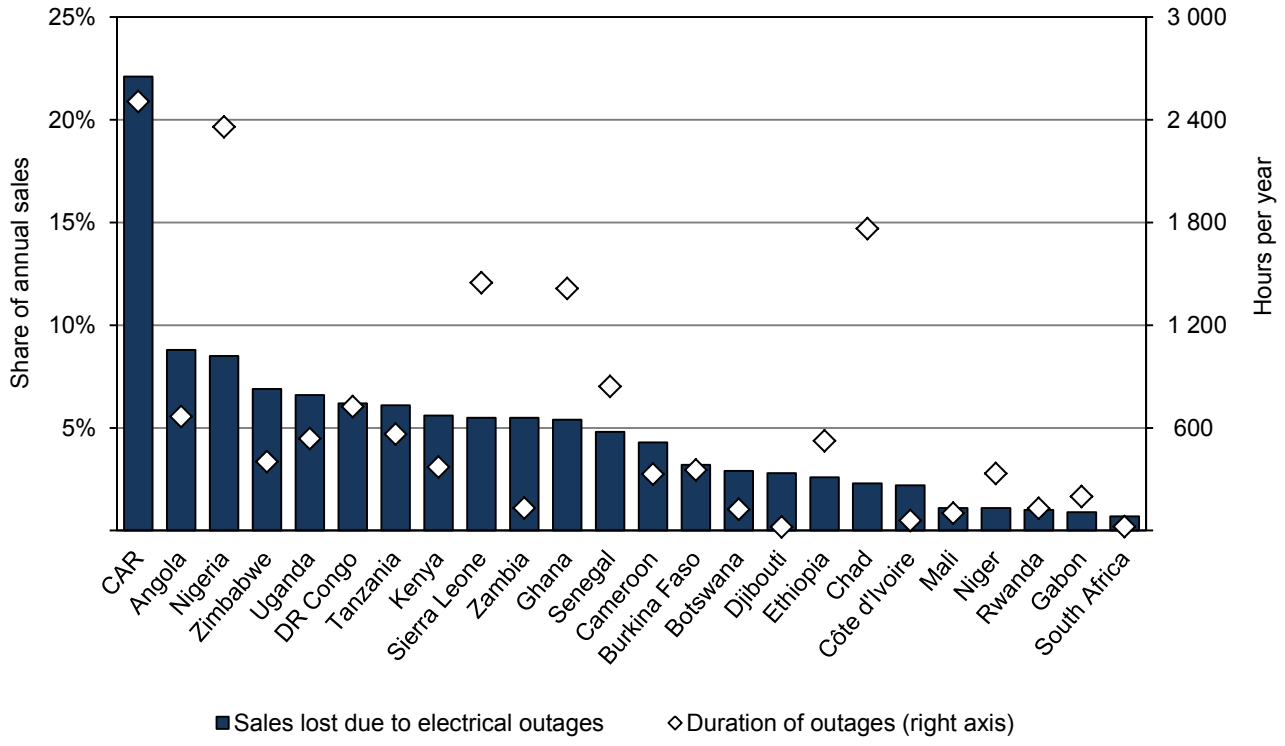
A growing energy demand

Although Africa has almost 15% of the world population, it only represents 4% of global energy demand (IEA, 2014). In addition, as highlighted in the IEA's *Africa Energy Outlook*, more than 620 million people in sub-Saharan Africa lack access to electricity, more than in any other region of the world. Sub-Saharan Africa is also the only region where the number of people living without electricity is actually increasing, as efforts to improve access are outpaced by population growth (IEA, 2014).

Demand in Africa is showing an upward trend, with a recent report suggesting it will grow fourfold by 2050, fuelled by population growth and the rise of the middle class (Castellano et al., 2015). Primary energy demand in sub-Saharan Africa increased by around 45% from 2000-12, reflecting around half of the GDP growth over the same period (AfDB/OECD/UNDP, 2015). A 1% increase in GDP therefore has been associated with a 0.5% increase in primary energy demand. In other developing countries, the relationship between energy consumption and GDP growth is stronger, highlighting the constraints in African energy supply (AfDB/OECD/UNDP, 2015). As shown in Figure 4.5, significant challenges exist with respect to electricity quality, as blackouts are common throughout the region. The pace at which energy infrastructure has been deteriorating has slowed, and rapid population growth can conceal the efforts and results taking place (IEA, 2015).

Infrastructure investments are necessary to ensure adequate energy provision, sustain long-term growth and meet the growing demand. Strong political commitment helped to increase energy access through grid and mini-grid systems in countries such as Ghana, Mali, Mozambique, Rwanda and Tanzania (AfDB/OECD/UNDP, 2015). For instance, Ghana will increase its capacity by 10 MW to meet the growing demand of a new middle class. In sub-Saharan Africa, the electricity access rate has increased from 23% in 2000 to 32% in 2012 and 145 million persons have gained access to electricity since 2000 (AfDB/OECD/UNDP, 2015).

Figure 4.5. **Duration of electrical outages and impact on business sales in selected countries**



Note: CAR = Central African Republic
Source: IEA (2014), *Africa Energy Outlook,* www.iea.org/publications/freepublications/publication/weo-2014-special-report-africa-energy-outlook.html.

Rapid growth for African cities

In Africa, urbanisation growth is amongst the highest of the world, but significant disparities exist. By 2060, Africa will be an urban continent with more than 1.3 billion people living in cities (AfDB, 2011). While Southern and North Africa are the most urbanised sub-regions with more than 50% of their population residing in urban agglomerations, East and Central Africa have on average less than 25% of their population in large cities.

With a growing middle class, African cities represent an untapped consumer market for investors. Disposable income is expected to increase by around 5.6% annually until 2030 and aggregate spending power is expected to increase from USD 420 billion in 2013 to 1 trillion in 2030 (Oxford Economics, 2014).

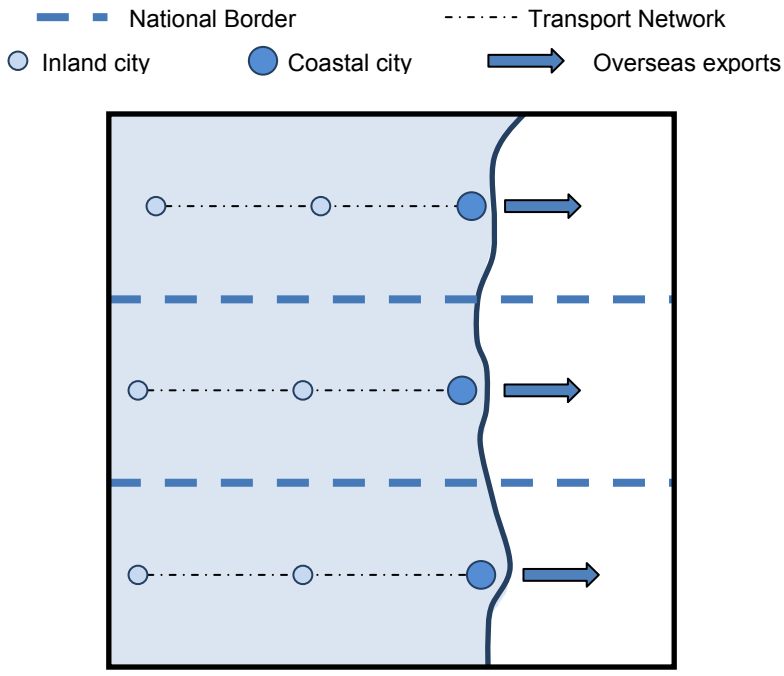
Improving livelihoods in African cities will require significant public and private investments in basic infrastructure and services. Confronted with fast demographic growth and weak urban planning, inclusive urbanisation strategies must take into account issues of job creation, access to quality services, mitigation of environmental damage and slum reduction (AfDB/OECD/UNDP, 2015).

Population growth, industrialisation and regional integration

Population growth will also have an effect on industrialisation. African industrialisation faces many challenges such as the quality of transport or the regulatory environment. Because other emerging economies outside of Africa are moving up the income ladder, increasing production costs and wages, some offshoring of production is now shifting from Asia into Africa. This has the potential to generate employment for the millions that will join Africa's workforce in the future (AfDB/OECD/UNDP, 2015).

One of the main barriers to industrialisation is the lack of regional integration amongst countries. The colonial period left a mark on the trading infrastructure. As shown in Figure 4.6, past territorial development focused on exploiting natural resources and shipping out commodities. This resulted in "comb shaped" development, where each territory developed transport networks to serve international ports, without developing connections between inland cities and port cities in other countries (AfDB/OECD/UNDP, 2015). Intra-African trade represents only 12% of the continent's trade, whereas intra-European is over 60% (The Economist, 2013; Eurostat, 2014). In Africa, there are often "thick" borders between geographically close countries. A stark example is that of Kinshasa, Democratic Republic of the Congo, and Brazzaville, Congo. Despite collectively forming Africa's third largest metropolis, only 1.1% of the Congo's imports come from across the border (Brenton and Isik, 2012).

Figure 4.6. **Africa's comb-shaped spatial organisation**



Source: AfDB/OECD/UNDP (2015), *African Economic Outlook 2015*, http://dx.doi.org/10.1787/aeo-2015-en.

Regional integration can indeed enable the clustering of economic activities across attractive economic zones while enabling infrastructure development in new locations and along transport corridors. Trade-facilitation reforms are an important lever of regional integration. They can help make borders ''thinner'' and thus lower transaction costs. Furthermore, the establishment of a Free Trade Area could constitute a milestone for Africa's integration agenda. In January 2015, the African Union Assembly launched the Continental Free Trade Area (CFTA) negotiations. The African Union expects countries to reach a continental trade agreement by 2017 (AU, 2015). In addition, the June 2015 launch of the COMESA-EAC-SADC Tripartite Free Trade Area is set to create an integrated market with a combined population of almost 600 million people and a total GDP of about USD 1 trillion.[1]

Risk management

Identifying and managing risks associated with environmental, social and human-rights issues are pivotal to developing sustainable investment plans. Risks are not only financial, but also often social, environmental, geopolitical or technological in nature. The profitability of foreign companies and their long-term investments are subject to external and domestic risks including declining commodity prices, the emerging economy slowdown, climate-change impacts, pandemics and social or political instability. For instance, public protests in many African countries remain high, driven mainly by employment-related claims for wage increases, better working conditions and improved public services (AfDB/OECD/UNDP, 2015).

Companies engage in risk mitigation by involving stakeholders, such as local communities, in their planning and decision making. A focus on shared value can thus help mitigate risk through a proactive and inclusive approach (OECD, 2015).

PUBLIC POLICY TO ACCOMPANY DEMOGRAPHIC GROWTH

Demographic growth opens up opportunities for development if accompanied by appropriate public policies. A "demographic dividend" refers to increased economic growth that can result from a decline in the mortality and fertility rates and the subsequent change in the age structure of the population. The number of active people supporting inactive people increases due to lower birth rates, which frees up resources to improve living conditions. With fewer births each year, the young dependent population in a country grows smaller than the working-age population. With fewer people to support, a country has a window of opportunity for improving economic growth if accompanied by the right policies and supportive investments.

Building resilient energy infrastructure

African governments are making efforts to promote electrification, but they are being outpaced by population growth. The rapid increase in energy demand has engendered energy crises affecting several African countries such as Ghana or South Africa.

Ghana is a clear example of an economy where energy supply has not been able to catch up with energy demand fuelled by population growth. The government is making efforts to increase the country's energy capabilities by means of a public-private partnership (PPP) with several multinational enterprises to profit from a recently discovered offshore gas reserve. The initial plan is to use the gas for domestic consumption and later, once demand is met, export to neighbouring countries. In addition, the Ghanaian government plans to liberalise the energy market to improve competitiveness.

Redesigning African cities

In the past, African governments did not prioritise urban development (ECOSOC, 2014). Colonial planning systems and practices reinforced population exclusion, and limited infrastructure investment and public-service provision. In addition, scarce resources, limited capacities and administrative barriers have often raised additional challenges for urban development (ECOSOC, 2014). Unlike in other regions, urbanisation in Africa has not driven industrialisation (AfDB/OECD/UNDP, 2015). Rather than obtaining formal employment, most rural migrants work in the urban informal sector (AfDB/OECD/UNDP, 2015).

Cities and local authorities are starting actively to develop urban development plans to cope with population increase. In March 2015, Egypt announced plans to build a new capital to reduce overcrowding pressure on Cairo. Given the challenging economic and social situation of the country, however, investors are cautious (The Capital Cairo, 2015).

The government of Kenya has introduced new urban-development plans for Nairobi, including the Nairobi Integrated Urban Development Master Plan (NIUPLAN) and the Nairobi Metro 2030. The goal is to transform Nairobi into an African metropolis by improving its competitiveness and converting it into a regional hub for business, trade and finance. Furthermore, it also aims to tackle some of the city's social challenges by improving municipal infrastructure, transport and access to utilities. Nairobi is also developing the Konza Techno City a technology hub aiming to develop Kenya's ICT sector further (Konza Techno City Kenya, n.d.).

Establishing manufacturing hubs

Industrialisation and regional integration in Africa is inhibited by significant infrastructure gaps. Despite this, some countries are making progress. Natural-resource endowments and relatively low labour costs can position Africa as a potential manufacturing hub, especially given the rapid wage increases Asian manufacturers are experiencing.

The government of Ghana, for example, is committed to domestic industrialisation and regional integration in the ECOWAS region. Companies that export more than 70% of their production can benefit from a free-trade-zone scheme (Ghana Free Zones Board, www.gfzb.com.gh). The government is also pursuing a partnership with Côte d'Ivoire to allow Ghanaian manufacturers to import input goods tax-free.

Promoting land-transport trade is also a priority for Ghanaian policy makers. The government is working to reduce the number of checkpoints inside the country and engaging with neighbouring countries such as Togo, Benin and Côte d'Ivoire with a view to having them reduce checkpoints to a maximum of three. It is also in the process of building its part of the Lagos-Abidjan transport corridor, which will make shipping goods in the region faster and cheaper.[2]

Despite foreign investment restrictions in sectors like telecommunications and banking, foreign investment is taking off in Ethiopia. Through its five-year Growth and Transformation Plan, Ethiopia aims to achieve growth rates between 11% and 15%. The government, pressured by the lack of commodities in the country, is pushing for industrialisation in key sectors where they have a comparative advantage, such as flowers or leather. As a result, foreign investors are becoming more interested and, FDI reached its historic maximum of USD 1.5 billion in 2015 (Manson, 2015).

Many African countries are eager to start an industrialisation process but fear that newly created wealth will leave the country. Some governments are promoting policies that encourage foreign investors to contribute to local economic development. For instance, when Walmart

entered the East African market, it was required to invest USD 10 million in developing local suppliers (Massmart, 2015).

Box 4.2. International manufacturing in Africa

A quiet boom in manufacturing in Africa is already taking place. Although commodity exports, agriculture and services still account for the majority of economic activity in African countries, new manufacturing industries are emerging across the continent, as highlighted below.

Huanjian Group, one of the largest Chinese shoe manufacturers, recently announced its commitment to invest in Ethiopia and transform the country into a global shoe industry supplying Europe, Africa and North America. The company, jointly with the China-Africa Development Fund, plans to invest more than USD 2 billion and expects to create around 30 000 jobs in Addis Ababa by 2022. The company currently owns a factory in the country and employs over 4 000 locals. Part of the company's strategy is to help develop local manufacturers and establish an East African supply chain. The group wants African operations to be managed by local employees and they have already started training staff for managerial roles.

H&M and Primark, two of the largest fashion brands in the world, recently have started sourcing garments from Ethiopia. Garments now dominate Ethiopia's exports to the EU-15 with T-shirts and trousers, amounting to nearly 80% of the country's exports.[3] Despite these large numbers, Ethiopia only accounts for 0.01% of the global apparel exports, but shows huge potential to become a major player in the industry. Moreover, the country could become a global source of raw materials as it has millions of hectares of land with a climate suitable for cotton.

General Electric (GE) recently invested over USD 250 million in a manufacturing plant in Calabar, Nigeria. The new facility will serve as a hub for the company's oil and gas operations in the region. The plant will include training facilities that will enable knowledge transfer and career advancement for local employees through local and international training programmes.

Sources: All Africa (2014), "GE Names Julius Berger", http://allafrica.com/stories/201412041626.html; Lei (2015), "Rediscovering Africa", http://english.cntv.cn/2015/11/12/VIDE1447325907987305.shtml; General Electric (n.d.), "Nigeria", www.ge.com/africa/company/nigeria; Berg, Hedrich and Russo (2015), "East Africa: The Next Hub for Apparel Sourcing?", www.mckinsey.com/insights/consumer_and_retail/east_africa_the_next_hub_for_apparel_sourcing.

PRIVATE SECTOR INSIGHTS ON THE DEMOGRAPHIC BOOM IN AFRICA

The private sector is essential for Africa's economic development. The new Sustainable Development Goals (SDGs) recognise the role of the private sector as a key partner to achieve sustainable economic growth. Business-led initiatives, skill transfers and innovation, for example, will be essential to help African countries benefit from the demographic boom by providing more and better quality jobs, strengthening skills and enabling productivity gains. This section includes the insights drawn during the EMnet Africa meeting.

Strong public-private partnerships are essential to meet the growing energy demand

The long-term nature of energy infrastructure projects makes a stable macroeconomic environment essential. There is plenty of available capital to fund projects with risk-adjusted returns. The key to unlock financial flows is to build solid PPPs between African governments and multinational companies. Eni's Offshore Cape Three Points plant in Ghana has been noted as an example of a strong PPP. The plant will provide domestic gas supply to Ghana's thermal power plants for more than 15 years and contribute to government revenue through royalties and taxes on oil production. Long-term power-purchase agreements with the government and a USD 700 million World Bank guarantee were key factors that contributed to the agreement (World Bank, 2015).

Amongst the bottlenecks for energy-infrastructure projects identified by participants were the lack of skills in the local labour force and the complexity of land ownership. Energy infrastructure projects require high-skilled labour that can be difficult to source locally. A common short-term solution is to hire expatriates with the needed skills. A more long-term option is to set up partnerships with local universities to train and develop local youth with the right skills, which can contribute to local development and technology transfers. Land ownership is another bottleneck for energy projects in Africa. Multiple local tribal chiefs often own land and buying it can result in long and complex processes. African governments should set up schemes that facilitate land transactions.

Participants also emphasised the importance of regional integration for energy security. Facilitating exports in the regions and the institution of common markets will make Africa more attractive to investors and result in higher FDI inflows. Customs duties and other non-tariff barriers are preventing African countries from maximising their comparative advantages in natural resources.

African cities can leapfrog to become more sustainable and inclusive

The private sector believes in the growing importance of the African middle class and is willing to invest. This commitment needs to go hand-in-hand with appropriate urban development policies. Companies are starting to target urban low-income groups, usually employed in the informal sector. Participants identified business opportunities such as low-cost mobile banking and healthcare solutions as a first step towards more inclusive cities.

Above all, African cities have the opportunity to leapfrog into sustainable and inclusive cities. Local authorities should tap into the expertise of multinational companies for urban development plans. Businesses are eager to take an active role in this transformation and expressed their interest in constituting partnerships between companies and local authorities to design and implement these projects.

Strong governments are needed to promote industrialisation

Having a stable macroeconomic environment is crucial to encouraging financial flows into a country. In particular, governments should ensure stable exchange rates to minimise risk for foreign investors. Strong governments can facilitate the industrialisation process of a country. Ethiopia was mentioned as a country starting to show signs of industrialisation. For example, despite being one of the poorest countries in Africa with an agriculture-based economy, Ethiopia expects to receive a historically high USD 1.5 billion in FDI in 2015 (Manson, 2015). Investors are attracted to the country both for its commitment to diversify the economy by developing key

strategic sectors and its exchange-rate stability. In addition, Ethiopia's 2014 issuance of a USD 1 billion Eurobond was strongly oversubscribed, highlighting investor interest and confidence. The proceeds will finance three infrastructure projects, including a sugarcane plantation, a 6 000 MW hydropower dam on a tributary of the Nile and the country's railway network (Brand, Wallace and Pronina, 2014).

A "one country at a time" incremental approach for regional integration

There are several multilateral regional integration plans in Africa, yet a pan-African common market is still not a reality. Participants believed that bilateral trade agreements should be prioritised as part of a "one country at a time" approach. Supra-national trade agreements will come later. Creating clusters, sectoral zones and development "corridors" can be powerful tools to pave the way to better integration.

Not all stakeholders will benefit from regional integration, however. Countries that already have significant exporting capabilities are interested in protecting their regional dominance. Tensions exist between better regional integration and productivity increases. For instance, Kenya is interested is regulating the use of genetically modified organisms as a way to increase productivity through higher production, but this decision could threaten trade agreements with neighbouring regions that do not allow genetically modified crops.

Minimise reputational risk by applying "Know Your Customer" and "Know Your Investor" principles

According to EMnet Africa participants, "Know Your Customer" and "Know Your Investor" are the best tools to mitigate reputational risk. Businesses need local expertise, acquired by hiring locally or having a historic presence in the region, to assess their customers and investors. Cultural factors also will play a role. Participants highlighted that relying on "foreign notions" of certain rules or relationships carries the risk of leading to unexpected outcomes and reputational damage. It was noted, for example, that companies often underestimate the complexity of developing relationships with local governments, which is an area where understanding local cultural practices is particularly important.

Participants also believed that stigmatising a region as too risky is counterproductive. The Harkin-Engel Protocol, established to remove child labour from cocoa plantations in Ghana and Côte d'Ivoire, is a useful risk-management tool for companies to monitor compliance in their supply chain. Responsibly investing in a complex environment – such as cocoa plantations, which could have child-labour risks – is a way to promote development and reduce future risks.

THE WAY FORWARD FROM A BUSINESS PERSPECTIVE

Multinational companies have developed considerable knowledge on doing business in Africa. Before investing they do extensive due diligence on the investment climate and regulatory frameworks in target countries. Participants noted, however, that African governments could do more to promote investment opportunities. Tax incentives are simply not enough, and other factors such as legal frameworks for investment, governance and administration of incentives, access to land, environmental endowments and quality of infrastructures are considered particularly important.

EMnet Africa highlights three main recommendations. First, solid PPPs are necessary to develop African industry. Successful PPPs not only benefit companies and governments, but also strengthen the overall economy by sending the right signals to international markets. Second, participants emphasised the need for strong governments capable of pushing through necessary development policies. Ethiopia, in particular, is pursuing rigorous economic reform. Finally, participants encouraged regional integration through a realistic and "one at a time" strategy, i.e. by first reaching bilateral trade agreements that will then facilitate broader regional agreements.

Notes

1. The Common Market for Eastern and Southern Africa (COMESA), with 19 member states, is the largest regional economic organisation in Africa. The East African Community (EAC) is the regional intergovernmental organisation of Burundi, Kenya, Rwanda, Tanzania and Uganda. The Southern African Development Community (SADC) has a membership of 15 states, namely: Angola, Botswana, Democratic Republic of the Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.
2. The Abidjan-Lagos transport corridor is the major east-west transport corridor in West Africa, connecting the capital cities of five countries (Cote d'Ivoire, Ghana, Togo, Benin and Nigeria).
3. The EU-15 comprises Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

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Chapter 5

Green investment in emerging markets

Abstract

This edition of the EMnet "Greening of the Economy" Working Group Policy Note provides insights and policy recommendations from the private sector on renewable energy and energy efficiency investment in emerging markets. The analysis builds on discussions at the Working Group meeting held on 5 October 2015 at the OECD headquarters in Paris and organised by the OECD Emerging Markets Network (EMnet).

Key messages include:

- With the increasing cost competitiveness of renewables, clean-energy infrastructure projects are becoming more attractive to private investors.
- Green growth generates opportunities for investment across a range of areas including clean energy, energy efficiency and pollution reduction. Although the SDGs and the recently adopted COP 21 Paris Agreement showcase country commitments to greener growth, countries still need more stable and ambitious policies to promote it.
- The risk of policy changes remains the key challenge for scaling up investment, and companies continue to stress the importance of a predictable and stable policy environment for investment.
- Access to finance for small- and medium-sized projects remains a challenge. Creating new tools to pool investments or improve access to capital markets is essential to further expand investment.
- Further development of new technologies will deeply influence the pace of the transition to a greener economy. Companies are closely following technological developments and increasing investments in research and development.

CHALLENGES AND OPPORTUNITIES OF GREEN GROWTH IN EMERGING MARKETS

Developing countries and emerging economies are faced with rising resource requirements and escalating impacts from climate change. Promoting green growth through investments in areas such as renewable energy and energy efficiency will be essential. Given the importance of decarbonising the electricity sector, this Policy Note will focus primarily on promoting investment in renewable electricity generation. This was also the main area of discussion at the October 2015 Working Group on the Greening of the Economy.

Developing countries and emerging economies are appearing as key international markets for green investment. The adoption of the United Nations Sustainable Development Goals (SDGs) in September 2015 and the Paris Agreement reached at the 21st United Nations Conference of Parties (COP 21) in December 2015 add further momentum and international commitment to advancing global green growth.

Developing countries will be the hardest hit by climate change

Resource scarcity, pollution impacts and their particular exposure to the consequences of climate change amplify the importance and urgency of investing in green infrastructure in developing countries and emerging economies. Local air pollution, for example, is having an escalating impact on South and Southeast Asia. By reducing air pollution, the region could save up to USD 280 billion in associated health costs and nearly 200 000 early deaths (OECD, 2014b).

According to OECD estimates, climate-change impacts on the global economy will increase exponentially with rising temperatures. The highest impacts are expected in developing countries, particularly in Africa and South and Southeast Asia, with an ensuing decrease of up to 10% of expected world GDP by the end of the century.[1] Agricultural activities, particularly in the Middle East, Africa, and South and Southeast Asia, will be the hardest hit (OECD, 2015a). See Annex 5.1 for a detailed figure of expected losses by country and region through to 2060.

Rapid increase in energy demand

Rapid industrialisation, population growth and urbanisation are also increasing energy needs significantly (OECD, 2014a). The dynamics of international energy demand will be transformed in the next 25 years. The International Energy Agency (IEA) predicts that energy demand out to 2040 will slow and flatten in Europe, Japan, Korea and North America, while demand in the rest of Asia, Africa, the Middle East and Latin America will experience strong growth (IEA, 2015a). By the early 2030s, China is likely to overtake the United States as the largest oil-consuming country and India, Southeast Asia, the Middle East and sub-Saharan Africa will lead global energy-demand growth (IEA, 2015a). Facilitating cost-effective access to energy in rural and remote areas will be crucial for Africa, where a two-thirds increase is expected in the rural population of sub-Saharan Africa by 2050 (AfDB/OECD/UNDP, 2015). These increases in demand correspond with increasing attention to energy access as a key area for sustainable development. For example, Sustainable Development Goal (SDG) 7 seeks to provide universal access to modern energy services.

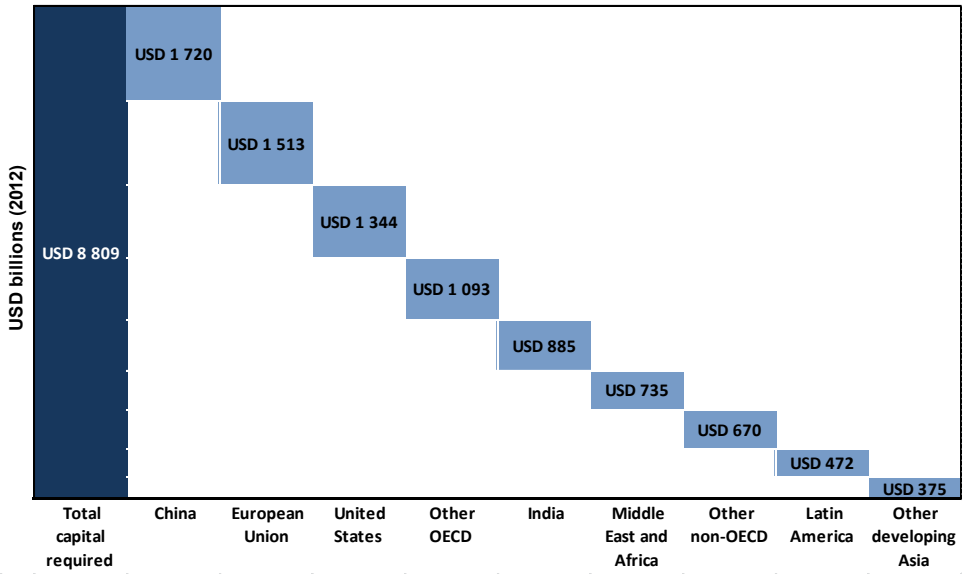
Green growth is essential

Fostering "green growth" in emerging economies and developing countries is essential to combat the impacts of climate change while responding to greater demand for resources.[2] Economic growth must catalyse investment and innovation in new technologies, services and infrastructure that will help mitigate and adapt to climate change, reduce pollution and promote conservation.

Green growth, however, presents a particular set of challenges and opportunities for developing countries and emerging economies. Although the SDGs and the recently adopted COP 21 Paris Agreement showcase country commitments to greener growth, countries still lack stable and ambitious policies to promote green growth. Businesses investing in these markets may face difficulties in hiring highly skilled local staff. In addition, weak institutional capacity and limited resources can constrain investment (OECD, 2015b). Incomplete technical and financial data can discourage new investments. Weak banking sectors and underdeveloped or inexistent capital markets limit green finance further. Finally, developing countries and emerging economies often face strong domestic pressure for rapid development, economic growth and welfare improvement, which could be viewed as conflicting with environmental objectives (OECD, 2013).

Achieving green growth will require increasing green investment at scale and pace (OECD, 2015c). A range of investment estimates exists for the transition to low-carbon economy. According to the Global Commission on the Economy and Climate, for example, to transition to a low-carbon economy around USD 93 trillion will need to be invested globally in cities, land-use and energy sectors alone between 2015 and 2030 (GCEC, 2014). For sustainable-energy infrastructure, the OECD estimates that nearly USD 9 trillion in capital will be needed, with China, India, Africa and the Middle East requiring significant investment (Figure 5.1).

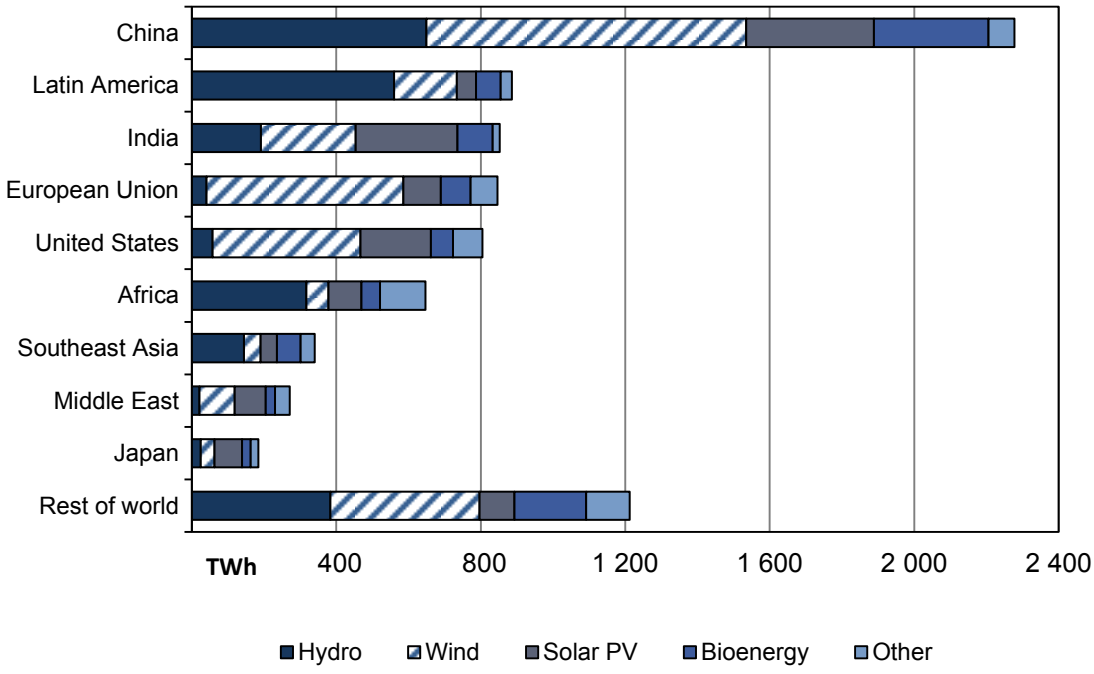
Figure 5.1. **Sustainable-energy investment requirements 2014-35 (450 Scenario)**[3]



Note: Figures are for power-plant investments in biomass, hydro, onshore and offshore wind, solar PV and "other renewables". Figures do not add up to rounding and are based on IEA data.
Source: OECD (2015h), *Mapping Channels to Mobilise Institutional Investment in Sustainable Energy, Green Finance and Investment*, http://dx.doi.org/10.1787/9789264224582-en.

In terms of additional capacity expansion to 2040, Figure 5.2 shows the growth in renewable-electricity generation using the IEA's New Policies Scenario.[4]

Figure 5.2. **Growth in renewable-electricity generation by region and type in the New Policies Scenario, 2013-40**

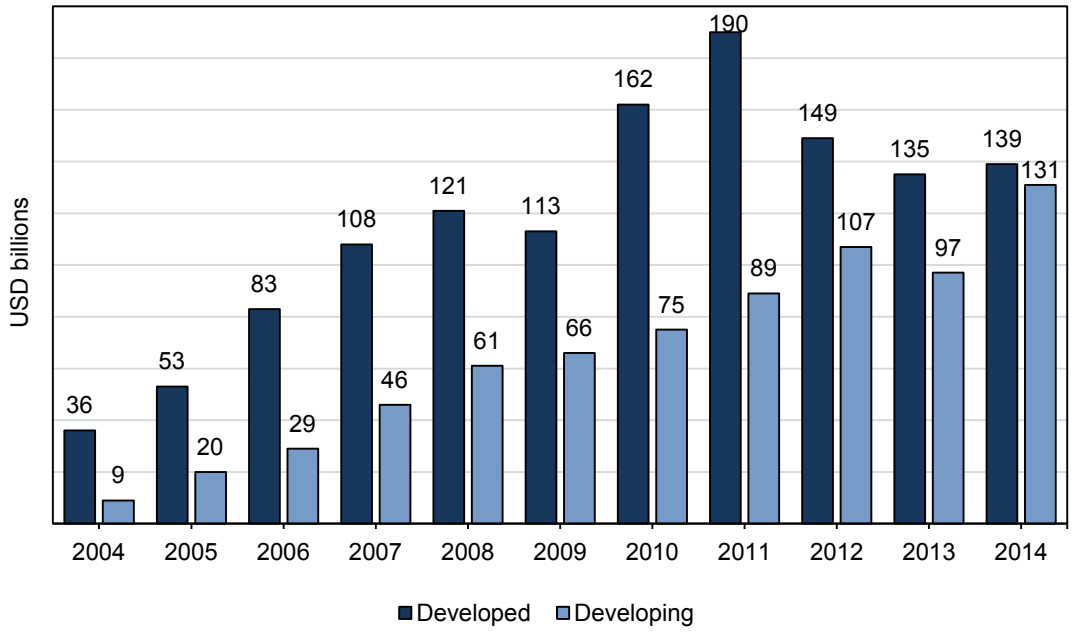


Note: "Other" includes geothermal, concentrated solar power and marine.
Source: IEA (2015a), *World Energy Outlook 2015*, http://dx.doi.org/10.1787/weo-2015-en.

Rapid investment must be scaled up further

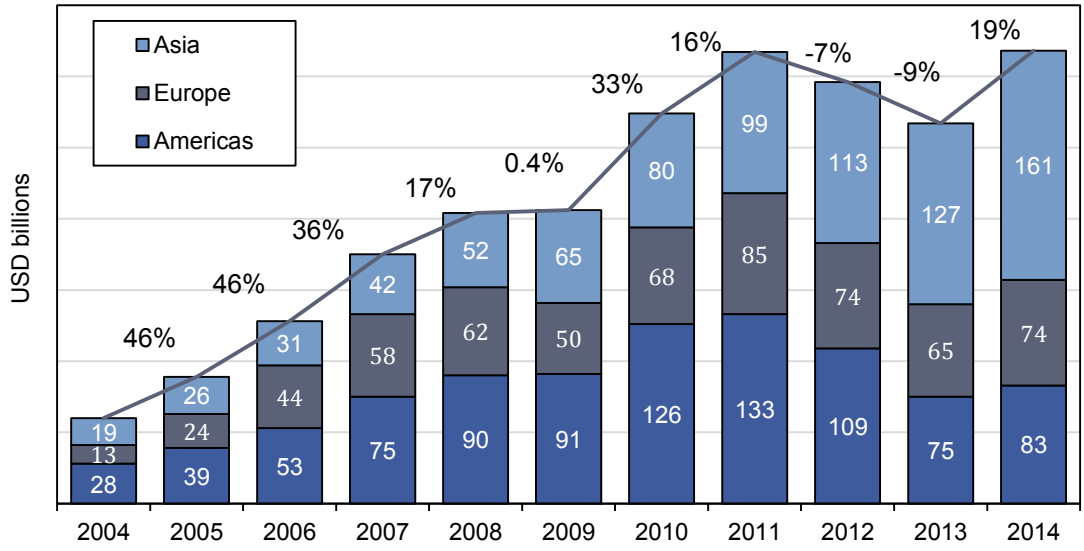
Developing and emerging countries are becoming key players in the renewable-energy sector (Figure 5.3). Renewable energies, particularly solar and wind, are becoming a natural part of the energy mix in developing and emerging countries thanks to their price competitiveness, ability to hedge against future fossil-fuel price increases and the relative speed of building up capacity compared to traditional fuel sources (BNEF, 2016). In 2014, investments in renewable energy in developing countries amounted to USD 131.3 billion, up 36% from 2013 and nearly surpassing the total amount invested by developed countries (USD 138.9 billion) (FS-UNEP, UNEP and BNEF, 2015). Recent clean-energy investment trends from Bloomberg New Energy Finance (BNEF) for the Americas, Asia and Europe are shown in Figure 5.4. Indonesia, Chile, Mexico, Kenya, South Africa and Turkey are investing significant capital and have individually invested more than USD 1 billion in renewables, while Jordan, Uruguay, Panama, the Philippines and Myanmar each spent between USD 500 million and USD 1 billion (FS-UNEP, UNEP and BNEF, 2015). These are encouraging figures, but given the scale of the needs, mobilising investments in green infrastructure requires leveraging even more domestic and international private capital (OECD, 2015c).

Figure 5.3. **Global new investment in renewable energy: developed versus developing countries, 2004-14**



Note: New investment volume adjusts for reinvested equity. Total values include estimates for undisclosed deals. Developed volumes are based on OECD countries excluding Mexico, Chile and Turkey.
Source: FS-UNEP, UNEP and BNEF (2015), *Global Trends in Renewable Energy Investment 2015*, http://fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2015.

Figure 5.4.**New investment in clean energy by region, 2004-14**



Source: FS-UNEP, UNEP and BNEF (2015), *Global Trends in Renewable Energy Investment 2015*, http://fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2015.

Mobilising private investment in China is particularly critical given the scale of the environmental challenges as well as the urgency of transitioning to a cleaner and lower-carbon economy. Ahead of the COP 21 climate-change conference, China made ambitious pledges to reduce carbon emissions per unit of GDP by 60-65% from 2005 levels by 2030 (Department of Climate Change, National Development and Reform Commission, 2015). During COP 21, China announced it would cut annual coal consumption by 100 million tonnes and reduce power-sector emissions of major pollutants by 60% by 2020 (COP 21, 2015). The Chinese government recognises, however, that it cannot transition to a low-carbon economy alone. Recent calculations from the People´s Bank of China and the United Nations Environment Programme (UNEP) show that USD 320 billion in green investment are needed annually over the next five years to achieve 2020 environmental targets (PBC and UNEP, 2015).[5] The Chinese government, however, can only supply 10-15% of this capital; the remaining investment will need to come from the private sector (PBC and UNEP, 2015). See Box 5.1 for a discussion of recent private investment in the Indonesian geothermal sector.

Box 5.1. Attracting private investment in the Indonesian geothermal sector: Sarulla Geothermal Power Plant

The Sarulla Geothermal Power Plant in Indonesia highlights how supportive public policies can help attract private investment into renewable energy. Indonesia has the world's largest geothermal resource with a potential capacity of 29 GW. Less than 5% of the potential resource has been utilised to date, however. Barriers to private-sector investment include a lack of financing, inadequate feed-in tariffs and regulatory challenges. For the case of the Sarulla Geothermal Plant, public-sector support improved the bankability of the project for the private consortium Sarulla Operations Limited. Government backing in the form of guarantees and long-term feed-in tariffs helped to attract long-term financing and improved the expected return rates of the project.

The Sarulla project has the greatest amount of private-sector involvement in the Indonesian geothermal sector. The Sarulla Plant is already delivering power at a comparable cost to other local and international geothermal projects, but in Indonesia, it remains more expensive than coal. When completed, it will be the largest single contract geothermal power-plant project in the world with a projected total capacity of 330 MW in 2018.

Source: Rakhmadi and Sutiyono (2015), *Using Private Finance to Accelerate Geothermal Deployment*, http://climatepolicyinitiative.org/publication/using-private-finance-to-accelerate-geothermal-deployment-sarulla-geothermal-power-plant-indonesia/.

Green growth can be an opportunity to accelerate development

The green transition is also an opportunity for countries to "leapfrog" older technologies, scale down investments in resource-intensive industries and promote the development of cleaner, more efficient infrastructure (OECD, 2014c). In developing countries and emerging economies, a major part of the infrastructure stock required to meet development goals is yet to be built. The massive unmet infrastructure needs therefore offer a window of opportunity to develop low-carbon alternatives directly. Choices made today about types, features and location of new and renovated infrastructure will "lock-in" commitments to future levels of climate change and to vulnerability or climate-resilience (Corfee-Morlot et al., 2012). Hence, there is an opportunity to advance forward-looking infrastructure development strategies that integrate climate change considerations to

achieve low-carbon and climate-resilient development. Other benefits of adopting green growth include creating domestic jobs and fostering technology transfers and innovation across value chains.

PUBLIC POLICIES FOR THE TRANSITION TO A LOW-CARBON ECONOMY

Climate change is not the only factor pushing countries towards a greener economy. Decreasing pollution and health costs and leapfrogging older technologies are a few rationales for governments to pursue a more sustainable economy. Commitments to implement the SDGs and the Paris Agreement on climate change give further support and weight to sustainable green investment. According to a recent OECD publication (2015f), *Aligning Policies for a Low-Carbon Economy*, to achieve this transition policy makers should co-ordinate green policies by using a three-pillar approach, which comprises:

- putting an effective price on greenhouse-gas (GHG) emissions, which will provide an incentive to reduce emissions, and invest and innovate in low-GHG technologies;
- developing regulations and technical standards when price signals may be less effective due to market barriers or transaction costs; this can be particularly effective in the household sectors and include measures such as emissions-performance standards or energy-efficiency rules;
- and promoting the competitiveness of low-carbon technologies by providing targeted technology support to help develop and lower the cost of risky, but potentially promising, low-GHG technologies.

In addition to promoting core climate policies, governments must also tackle policy misalignments that can hinder green investment. Conflicting incentives in competition, trade, tax and innovation policies can inadvertently discourage cleaner and more efficient investment (OECD, 2015f). For example, it is not only necessary to reduce subsidies for fossil fuels but also to revise existing taxation beyond the energy sector as these may be indirectly encouraging carbon-intensive choices. Similar misalignments are found in trade policy, where import tariffs still penalise trade in some of the technologies needed for the low-carbon transition (OECD, 2015e).

Local-content requirements are frequently used by governments to promote domestic renewable-energy industries but can have harmful unintended consequences. In the case of India's solar photovoltaic (PV) market, the local-content requirement increased costs by up to USD 0.08 per watt for Indian solar energy (OECD, 2015e). In Brazil, local-content requirements to source wind-turbine towers locally increased overall project costs due to Brazil's high steel prices (OECD, 2015e). Recent empirical analysis by the OECD confirms that these requirements can hamper international investments in solar PV and wind energy. Furthermore, when the full value chain is considered, local-content requirements have negative or mixed impacts on job creation, value added and technology transfer (OECD, 2015e). To avoid negative outcomes, policy makers should design domestic incentive measures that do not differentiate between domestic and international investors. For example, well-targeted research and development (R&D) support can stimulate innovation across segments of the value chain, build local manufacturing capability and encourage technology transfer from imports and foreign direct investment. Training programmes also can be used to improve the technological skills of manufacturers, build local capability of downstream firms and encourage innovation (OECD, 2015e).

Policy makers must also reduce barriers that inhibit private investment in green infrastructure. Governments should recognise that in the realm of infrastructure investment, whether it is low-carbon or not, the private sector faces many challenges. Political and regulatory uncertainty, the absence of a clear pipeline of projects and critical mass and the need for projects at an appropriate scale (e.g. projects may be too small or too large) can all reduce the attractiveness of investments for the private sector (OECD, 2015h). In some countries, companies may simply lack information regarding available green technologies. For developing countries and emerging economies, there are additional challenges such as weak enabling conditions, limited technical and institutional capacity, a shortage of political will or awareness, and a potential path dependency towards traditional infrastructure development (e.g. building fossil-fuel fired plants to supply energy for rapidly growing needs rather than pursuing cleaner alternatives) (Corfee-Morlot et al., 2012).

To overcome these financing barriers, governments can help to mitigate risks by using targeted interventions to reduce or reassign different risks. These mechanisms include guarantees and insurance products, public stakes and other forms of credit enhancement. By providing coverage for risks which are new and are not currently covered by financial actors, or are simply too costly for investors, risk-mitigating tools increase the attractiveness and acceptability of green investments for risk-averse investors (OECD, 2015h).

Managing policy risk

While political risks such as expropriations or security issues remain relevant in some regions, investors identified the risk of policy changes ("policy risk") as the key barrier to investment. A stable policy environment is crucial for any project and is particularly important for green investments (OECD, 2015g).

The retroactive changes to renewable support policies in Spain are a particularly well-known instance of policy risk. Beginning in the mid-2000s, the Spanish government granted generous subsidies to renewable electricity producers, such as solar and wind, to increase the share of renewables in the energy mix. Rapid cost reductions in renewable technologies and the support for renewables stimulated investment on a much wider scale than the government expected. The costs of renewable energy support increased from EUR 1.2 billion in 2005 to EUR 8.4 billion in 2012 (European Commission, 2014). Meanwhile, the Spanish electricity system had a revenue deficit related to its regulated activities, known as the tariff deficit. The significant rise in electricity prices also contributed to the tariff deficit as Spain's electricity bills increased 60% between 2006 and 2012 (Andreu, 2014). By 2013, Spain's total tariff deficit reached EUR 30 billion (Oxford Institute for Energy Studies, 2013). Economic recession combined with a poorly-designed and expensive renewable energy support policy turned the support into a political and economic issue (Oxford Institute for Energy Studies, 2013). In this situation, Spain decided to cut back on subsidies retroactively. Although Spain did increase the role of renewables in the energy mix, the retroactive changes are ultimately harmful for future renewable-energy development and generate uncertainty regarding future policy stability. In addition, these changes also set a poor example to other countries that could consider implementing similar policies.

Box 5.2. Public policies to encourage energy efficiency

Governments at all levels in both developed countries and emerging economies are becoming increasingly active promoters of and investors in energy efficiency. In a scenario with no changes in current green policies, world energy demand will increase more than 45% by 2040. A transition to a green economy cannot occur without improvement in energy efficiency. Despite low oil prices, energy efficiency remains at the top of the policy agenda. Yet encouraging improvements in energy efficiency faces a range of complex barriers and will require policy co-ordination amongst all stakeholders involved, including governments, ministries, agencies, contractors, etc.

Governments promote domestic energy efficiency in several ways. By adopting regulations and technical standards, public policies can shape the way energy-efficiency markets operate. Governments can actively encourage energy-efficiency technologies by directly investing in a public-private partnership or by offering incentives such as tax benefits for efficiency. Governments can also further develop their human capital in the engineering and technical fields relevant for energy efficiency by promoting the related education.

Sources: IEA (2014a), *World Energy Investment Outlook 2014*, www.iea.org/publications/freepublications/publication/WEIO2014.pdf; IEA (2015b), *Energy Efficiency Market Report 2015*, www.iea.org/publications/freepublications/publication/MediumTermEnergyefficiencyMarketReport2015.pdf; Petrick and Sinha (2015), *Energy Efficiency: Opportunities in Emerging Markets*, www.bain.com/Images/BAIN_BRIEF_Energy_efficiency_in_emerging_markets.pdf.

PRIVATE SECTOR INSIGHTS AND RECOMMENDATIONS

The private sector is becoming increasingly engaged in green projects. With the increasing cost competitiveness of renewables, clean-energy infrastructure projects are becoming more attractive to private investors. Key areas of discussion at the 2015 EMnet Working Group on Greening the Economy included scaling up green finance, overcoming public-policy barriers and the importance of technology in improving resource efficiency.

Financing the transition to a greener economy

Financing green infrastructure projects in emerging markets requires mechanisms that are adapted to the project and the local context. In the case of renewable energy, Working Group participants noted that solar developers particularly can be affected as financing is not well adapted to most solar projects where the project size can be smaller than in other energy sectors.

New banking regulations motivated by the 2008/09 global financial crisis present an additional challenge. Participating banks noted that they were spending more capital to comply with heterogeneous rules, entailing higher financing costs. In their efforts to promote financial stability, regulations such as Basel III and Solvency II may inadvertently limit the ability of regulated institutions such as banks and insurance companies to finance long-term infrastructure investments. Participating multinational banks estimated that projects under USD 100 million might not be financially viable unless financing rules and procedures were standardised across countries.

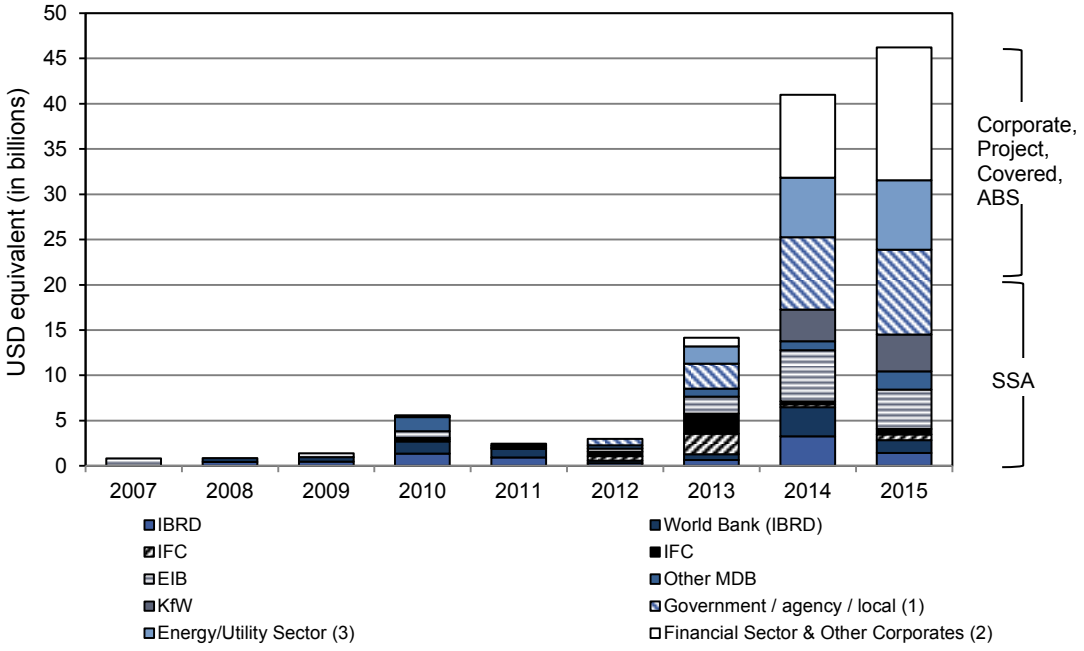
Even for private equity and development finance-backed funds there are barriers in the medium-scale energy projects. Participants noted particular difficulties for projects under USD 5 million. While these small projects face financing barriers, their small size can also deter project developers that cannot support the long process of technical assistance and diligence. In

addition, the current volatility in emerging-economy exchange rates also poses an additional challenge. To overcome these barriers, investors are pooling together different projects in a same country or combining investments in developing and developed markets to lower financial costs and make them attractive to institutional investors.

Green bonds are recognised as an important development. Since 2013, green bond issuance has increased significantly, yet total green-labelled issuance remains a small fraction of the bond market. By November 2015, more than USD 40 billion in "labelled" green bonds had been issued globally (Figure 5.5).

Figure 5.5. **Composition of the green bond market**

(as of November 2015, USD, gross issuance)



Note: SSA = Sub-sovereign, Supranational and Agency; Muni = Municipal; ABS = Asset Backed Securities. (1) Includes national development banks, sub-sovereign jurisdictions including municipalities, agencies, and local funding authorities. (2) Includes financial-sector bonds and all other corporates that are not energy/utility sector, as well as covered, project and ABS that are not energy/utility related. (3) Includes corporate bonds issued by energy/utility companies as well as covered, project and ABS related to energy/utility companies.

Source: OECD and Bloomberg Philanthropies (2015), "Green bonds: Mobilising the debt capital markets for the low-carbon transition", http://issuu.com/oecd.publishing/docs/green-bonds-policy-perspectives-lr.

Green bonds raise capital that can be used for a variety of financing purposes. To date, the majority of green bonds have been used to refinance existing lending at preferable interest rates. They can also finance new and anticipated lending indirectly (via corporate bonds and "use of proceeds" bonds) or directly (via project bonds) (OECD and Bloomberg Philanthropies, 2015). Participants also recalled that it was difficult to define what made a financial product "green" since there were no universally accepted definitions or standards for green projects or activities. Here, progress is being made by the Green Bond Principles and Climate Bond Standards. In addition, many investments that are not "labelled green" may actively contribute to sustainable development. Financial institutions participating in the Working Group expressed concerns that the "labelling" of a bond as "green" would imply additional upfront and ongoing transaction costs for certification, verification and monitoring. In practice, many issuers have accepted these costs in return for benefits such as diversification of their investor base, enhanced credibility regarding sustainability strategies and reputational benefits (OECD and Bloomberg Philanthropies, 2015).

Overcoming barriers to green investment

In addition to financing, private green investments depend on the public sector to develop a business-friendly environment. Governments need stable, predictable and long-term policies for companies to develop projects successfully (OECD, 2015h). Recent retroactive regulatory changes for renewable energies in OECD countries such as those in Spain in 2012 are harmful institutional setbacks. Investors fear that these changes can set a dangerous precedent for emerging economies and developing countries.

Renewable-energy companies and financial-service providers attending the Working Group expressed concerns about fossil-fuel subsidies. Not only do fossil-fuel subsidies hurt the development of renewable energies, they also undermine governments' own efforts to promote cleaner and more efficient options. Moreover, fossil-fuel subsidies will either increase public expenditure or reduce tax revenue, and this can overcommit public budgets or misallocate funds that could be used in other key sectors, such as education or health (OECD, 2015d).

Requirements to use local content are an additional barrier to investment. Since 2008, local-content requirements have grown in both developed countries and emerging economies to favour domestic manufacturers of solar-PV and wind-energy products (OECD, 2015e). These requirements have led to many World Trade Organization disputes. Investors stressed the importance of removing these local-content requirements, which are detrimental to international investment and have a limited, if not negative, impact on job creation and technology transfer (OECD, 2015e).

In general, companies at the Working Group meeting did not perceive the lack of adequate skills within local labour forces as a constraint for investing in emerging markets. Some companies have developed in-house training centres for local employees while other enterprises have opted to hire foreign professionals with the adequate technical capacity. In this sense, governments should ensure that highly qualified foreign workers can work in local labour markets.

Investing in China

The private sector recognises the importance of, and opportunity for, scaling up investment in clean energy and resource-efficient technologies in China (Box 5.3).

Box 5.3. Key messages from the private sector on green investment in China

The Chinese market is active in environmental and efficiency technologies. At the 2015 EMnet meeting in Beijing on *Doing Green Business in an Evolving Economic Landscape*, participants shared diverse experiences with green innovation. For example, industrial facilities are recycling and recovering water and solid wastes. Sustainable aviation fuels are being developed with blended biofuels. Decreasing the weight of manufactured components, such as those in the automobile industry, is improving engine efficiency. Non-traditional areas, such as improving air-traffic control, can reduce fuel use and delays. Key outcomes from the discussion include the following.

Compared to other sectors, green-technology industry is relatively open to foreign business.
While some industries have shown signs of opening, not all markets are fully open to foreign business. For example, participants noted that for foreign investors, real estate or IT industries are more challenging than the environmental-technology sector. However, there are still limits on renewable electricity asset ownership, operation and market participation. Protecting the intellectual property of green-technology developments and further opening markets are key issues moving forward.

Strong momentum from government and new legislation is opening up opportunities.
Participants agreed that the Chinese government is prioritising environmental protection and green industrial development. For example, new legislation related to the management of water and land treatment was highlighted as a key area for opportunity.

Green technologies are there; affordability remains a challenge.
Participants highlighted diverse technological solutions that are available for greener and cleaner business practices. While affordability remains a challenge for smaller companies, large companies can help to lead trends. Clusters can be developed to support green technologies. For example, the city of Tianjin has developed the Tianjin Green Supply Chain Center, which helps companies source green technologies in a specially zoned area that benefits from favourable government support. Overall, China has had a positive experience with the development of Special Economic Zones (SEZs), and these have been particularly effective to attract foreign direct investment without crowding out domestic investment (Wang, 2013). However, further study of green-focused SEZs is needed to fully assess their effectiveness (Mohiuddin et al., 2014).

Urbanisation will be a key driver of business opportunities.
Urbanisation is contributing to pollution impacts, notably with vehicle emissions, but is also opening many opportunities for green development. Air treatment, in particular, is expected to generate trillions in investment opportunities. Public-private partnerships remain the model of choice for urban-infrastructure projects.

Sources: Key outcomes of the discussion at the EMnet meeting in China, jointly organised by the China International Council for the Promotion of Multinational Corporations (CICPMC) on 7 November 2015 in Beijing; Wang, J. (2013), "The Economic Impact of Special Economic Zones"; Mohiuddin, M. et al. (2014), "The Special Economic Zone as a Locomotive for Green Development in China", *http://dx.doi.org/10.5539/ass.v10n18p109*.

The role of energy efficiency and new technologies

To limit global warming to 2° Celsius, energy efficiency must play a key role in reducing GHG emissions. According to IEA estimates, by 2030, energy-efficiency gains should be responsible for 49% of total energy savings, ahead of investment in renewables (17%) and upstream methane reductions (15%) (IEA, 2015b). Country data shows that energy efficiency will be responsible for approximately 80% of total savings in China and 70% in the European Union. This increased efficiency will come mostly from the industrial, construction and transport sectors (IEA, 2015b).

Improved energy efficiency will not only affect the final outcome of emission targets, it will likewise have an effect on other sectors such as industrial productivity and air quality, hence a positive effect on countries' overall economic performance (IEA, 2014b). Further development of new technologies will deeply influence the pace of the transition to a greener economy. Companies are following technological developments closely and increasing investments in research and development (R&D). In 2014, corporate R&D investments in renewable energies alone amounted to USD 7 billion (FS-UNEP, UNEP and BNEF, 2015). Smart-grid technology will increase energy efficiency and provide reliability to the transmission system and grid stability. The implementation of micro-grids and distributed generation have great potential in both developed and emerging markets, particularly in Africa, where power blackouts are frequent, and isolated rural areas can benefit from small local projects.

CONCLUSIONS

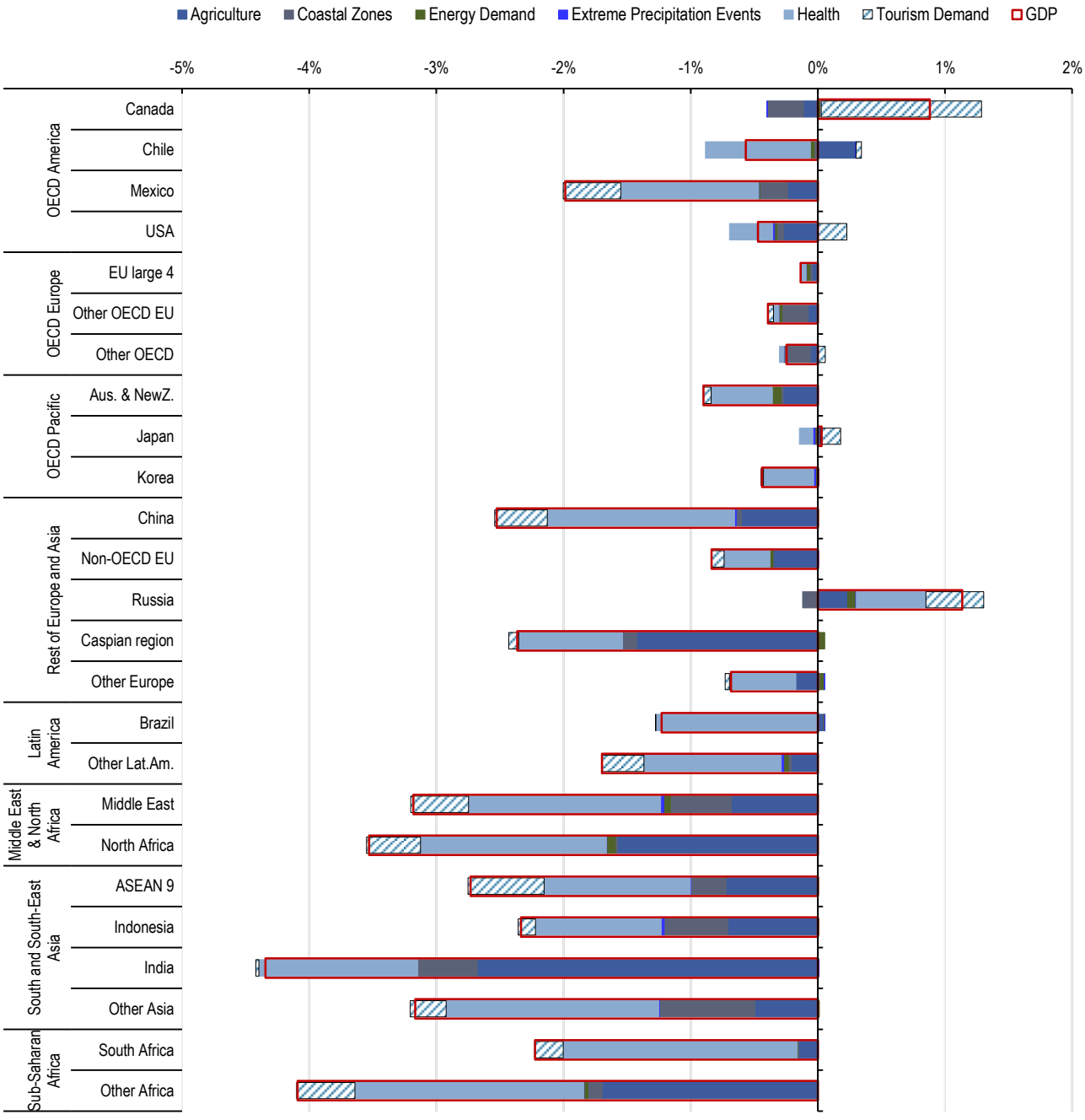
Governments and the private sector are making strong commitments to reduce emissions and improve environmental protection. It is now essential to continue to translate these goals into additional action and investment. Moreover, it is necessary to divert high-carbon investments to lower-carbon alternatives.

Despite progress, governments still struggle to fully incorporate the economic benefits of green growth and consider the potential negative feedbacks of environmental damage on GDP. Without these considerations, it is difficult to align economic and environmental priorities to prioritise green growth objectives. Greener growth can be viewed as an opportunity for businesses as markets for green technologies and services expand, innovation is incentivised, and efficiency improvements are rewarded. However, some Working Group participants still view the low-carbon transition in terms of "winners" and "losers" where new technology developers will gain and fossil-fuel developers will suffer. High-carbon incumbents, however, will continue to play a role in many developing countries as essential energy providers. Scaling up new technologies and managing the transition for existing firms will be essential moving forward.

In emerging economies and particularly in China, significant new investment opportunities are being generated for clean-energy, energy-efficiency and pollution-reduction projects. Overcoming financing barriers for small- and medium-sized projects remains a challenge. Creating new tools to pool investments or improve access to capital markets through bond financing is essential to expand further investment. Energy companies around the world are monitoring renewable tariffs closely for expansion. Policy risk, however, remains the key challenge for scaling up investment, and companies continue to stress the importance of a predictable and stable policy environment for investment.

ANNEX 5.1.

Annex Figure 5.1. Damages from selected climate-change impacts, central projection
Percentage change in GDP in 2060



Source: OECD (2015a), *The Economic Consequences of Climate Change*, http://dx.doi.org/10.1787/9789264235410-en

Notes

1. The category "South and Southeast Asia" includes ASEAN countries (Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei Darussalam, Viet Nam, Lao PDR, Myanmar and Cambodia) plus India and other developing Asian countries (OECD, 2015a).
2. "Green growth" is defined by the OECD as "economic growth and development that ensures that natural assets continue to provide the resources and environmental services on which our well-being relies" (OECD, 2011).
3. The 450 Scenario sets out an energy pathway consistent with the goal of limiting the global increase in temperature to 2° Celsius by limiting concentration of greenhouse gases in the atmosphere to around 450 parts per million of carbon dioxide (CO_2) (IEA, n.d.).
4. The New Policies Scenario of the World Energy Outlook serves as the IEA baseline scenario. It takes into account broad policy commitments and plans that have been announced by countries, including national pledges to reduce greenhouse-gas emissions and plans to phase out fossil-energy subsidies, even if the measures to implement these commitments have yet to be identified or announced (IEA, n.d.).
5. Calculations from the People´s Bank of China and the United Nations Environment Programme show that USD 320 billion in green investment are needed annually over the next five years to achieve 2020 environmental targets in China. This estimate is based on a range of inputs including: (1) The 12th Five-Year Environmental Protection Plan and the Ministry of Environmental Protection (environmental protection related investment during the 12th Five Year totalled CNY 3.4 trillion, CNY 1.5 trillion of this amount will be allocated to eight key projects; total final investment is expected to exceed CNY 5 trillion), (2) the Plan on Water Pollution Prevention and Control (issued in 2014, total investment planned at CNY 2 trillion), (3) the Plan on Air Pollution Prevention and Control (issued in 2014, total investment planned at CNY 1.7 trillion), (4) China Railway Annual Report (a fixed investment of CNY 800 billion is planned for 2014; realised investment in 2013 was CNY 663.8 billion), (5) the Renewable Energy Policy Network (in 2013, China's investment in wind, solar, and other renewable energy projects (excluding natural gas) was USD 56.3 billion, or approximately CNY 350 billion), (6) Bloomberg (China's investment in renewable energies (excluding natural gas) was USD 67.7 billion in 2012, or CNY 420 billion) (PBC and UNEP, 2015).

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