THE EMERGING MARKETS MULTINATIONALS REPORT 2016

Lourdes Casanova, Senior Lecturer, Academic Director
Anne Miroux, Visiting Fellow
Emerging Markets Institute
S.C. Johnson School of Management, Cornell University

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THE CHINA SURGE

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Preface

“Emerging markets represent ‘underfunded growth opportunities with problems.’ These problems impede their ability to secure the very funding they need to fully realize their growth opportunities. To my mind, this is what really sets them apart and it is the guiding principles for me and many scholars who have been studying EMs over the past decades.

In fact, it was the challenge of defining these so-called problems that led the Johnson School at Cornell University to launch its Emerging Markets Institute (EMI) in 2011. My colleagues and I are very proud of EMI, the many activities which it spearheads, the thought leadership it inspires, and especially under the able leadership of Dr. Lourdes Casanova, its executive director for the past two years.

The newest initiative of the EMI is The Emerging Market Multinationals Report (EMR), co-authors by Dr. Casanova and her collaborator, Anne Miroux, which I commend as important reading for anyone who invests in or pursues new business opportunities in EMs. What the report does is flip our guiding principles on their heads. The focus is on EMs *not* as economic engines dependent on external financing from elsewhere, but as the very drivers of those outbound global capital flows. And it puts EM-based multinationals squarely in our sights as the mechanisms through which those flows arise. We learn about the 146 companies from the largest 20 EMs – what Casanova and Miroux call the “eMNCs” - come from a diverse group of industries, that they reveal remarkably different fundamentals and that they drive outbound foreign direct investment flows to a wide range of target markets. A special chapter features the surge of China-based eMNCs and their voracious cross-border acquisition activity with fascinating facts about the unusual geographic array of target countries and about the differences in terms and conditions under which the deals go down.

I predict that the report will change your priors on EMs and eMNCs. It certainly changed mine.”

Andrew Karolyi
Professor of Finance and Harold Bierman Jr. Distinguished Professor of Management
Associate Dean for Academic Affairs
S.C. Johnson Graduate School of Management
Cornell College of Business
Cornell University
Author, Cracking the Emerging Markets Enigma (Oxford University Press, 2015)

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Abbreviations and Acronyms

ADB	Asian Development Bank
AEC	ASEAN Economic Community.
AIIB	Asian Infrastructure Investment Bank (AIIB)
ASEAN	Association of South East Asian Nations
BNDES	Brazilian National Development Bank
BRIC	Brazil, Russia, India, China
BRICS	Brazil, Russia, India, China and South Africa
ECLAC	Economic Commission for Latin America and the Caribbean
EMI	Emerging Market Institute
eMNC	Emerging market multinational corporation
EMnet	OECD Emerging Markets Network
EU	European Union
FDI	Foreign direct investment
FTSE	Financial Times Stock Exchange 100 Index
GDP	Gross domestic product
GFC	Global Financial crisis
GII	Global Innovation Index
GFSR	Global Financial Stability Report
GVC	Global value chain
ICT	Information and communication technology
IFC	International Finance Corporation
IMF	International Monetary Fund
ITU	International Telecommunications Union
M&A	Mergers and acquisition
MNC	Multinational corporation
MSCI	Morgan Stanley Capital International index
NASDAQ	National Association of Securities Dealers Automated Quotations
NDB	New Development Bank

NYSE	New York Stock Exchange
OECD	Organization for Economic Cooperation and Development
OFDI	Outward FDI
PISA	Program for International Assessment Student
PPP	Purchasing power parity
R&D	Research and development
RCEP	Regional Comprehensive Economic Partnership
SDRs	Special Drawing Rights
SEC	Security and Exchange Commission
SME	Small and medium-sized enterprise
SOE	State owned enterprise
TEV	Total enterprise value
TNC	Transnational corporation
TNI	Transnationality Index
TPP	Trans-Pacific Partnership
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNDESA (or DESA)	United Nations Department of Economic and Social Affairs
USITC	United States International Trade Commission
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
YTD	Year to date

Executive Summary

Emerging economies are one of the hallmarks of today's global economy, and the dramatic rise of their multinationals, also known as emerging market multinationals (or eMNCs), is a testimony to their growing weight and influence. The past fifteen years have seen the remarkable overseas expansion of such enterprises, a phenomenon that is bringing about profound changes in a wide array of areas, whether in terms of displaced trade and investment flows, new business models and the emergence of a new geography of global innovation for instance. This phenomenon is part and parcel of the reconfiguration of the new global economic and political landscape that we are witnessing in these early decades of the XXIst century. The Emerging Market Multinationals Report (EMR) series published by the Emerging Market Institute (EMI) aims at contributing to a better understanding of this phenomenon and its economic and societal implications. This first issue of the series sets the overall contours of the phenomenon and examines some characteristic of the eMNC expansion.

Emerging economies are the new heavyweights

The E20

Argentina, Brazil, Chile, China, Colombia, Egypt, Indonesia, India, Iran, Malaysia, Mexico, Nigeria, Philippines, Poland, Republic of Korea[1], Russia, Saudi Arabia, South Africa, Thailand, and Turkey.

Emerging economies in this report are examined through the experience of the E20, a grouping of 20 top emerging economies – selected among emerging economies, based on the size of their GDP and population and of significant influence in global and regional trade and investment. The E20 includes countries from Africa, Asia, Latin America as well as Poland and Russia (see box).

Emerging economies display a number of features (demographic; economic; soft power attributes; as well as others related to technology, innovation and education) that have contributed to their new positioning globally. Accounting today for more than 50 % of the world's population, and almost half of the global GDP, the E20 countries occupy a major place on the world scene. Many emerging economies in the E20 have registered strong growth rates over the past twenty years, which explain their key contribution to global output today. They have developed innovation and technological capabilities and a number of them have become significant sources of innovation, with sometimes cutting-edge technologies in industries such as computer industry, energy, solar, transport or mobile services - to name a few. Developments in the area of global governance and international cooperation with, for instance, the creation of multilateral institutions such as the New Development Bank (NDB) and the Asian Infrastructure Investment Bank (AIIB) are signs of their growing influence, enhancing their ability to exercise soft power on a global scale. The recently approved IMF quota and governance reforms that strengthen their representation in the IMF's governance structure also reflects the new dynamics of the global economy, and the growing key role of emerging economies.

Emerging economies are—and will remain—quite diverse. Vulnerability to external shocks and currency volatility has often characterized them. It would be unwise, to expect that the growth achieved by a number of them over the past fifteen years could be maintained in the future. There will be ups and downs, of a bigger or smaller order, depending on each situation. But, overall, their remarkable rise over the past decades has definitely challenged the status quo. A new global landscape has crystallized before our eyes. The impressive breakthrough of emerging economies as foreign investors and the spectacular blossoming of some of their firms as world champions, the topic of this report, is but one illustration of this profound transformation.

A radically different global FDI landscape has settled in

The global Foreign Direct Investment (FDI) landscape has gone through profound changes in the past two decades with the consolidation of emerging economies as key players both as recipients and sources of FDI. The E20 for instance accounted for 30% of global inward FDI flows on average over the past five years.

As regards to outward FDI, the rise of emerging economies as key outward investors started later but has been particularly impressive since the early 2000s, especially in the aftermath of the Global Financial Crisis: for instance, E20 economies account today for 20% of global OFDI flows; their share was 2% at the turn of the century. This trend was led by Asia whose flows have clearly outpaced those from Latin American emerging economies, especially after the Global Financial crisis. In 2015, two of the E20 countries (China and Korea) were among the top 15 investors in the world, with China in the third top position.

Differences between OFDI support policies partly explain this situation: for instance, in China and Korea—the two largest investors of the E20 in 2015—the internationalization of enterprises has become a strategic issue and OFDI support policies have been instrumental to achieve it. This has not been the case in Latin America where pro-active OFDI support policies have been very limited or non-existent. Even in Brazil - long unique in the region in this respect - support for OFDI, however limited, appears to have lost traction in recent years.

The geographical distribution of OFDI from emerging economies has also evolved, even if such FDI still remains largely South-South. While investors from emerging economies used to invest primarily in other emerging and developing economies, usually in their neighboring region, their natural market, a number of multinationals from emerging economies have ventured forcefully into more distant destinations in the past decade. For instance, the evolution of the OFDI stock of two major economies in the E20, Brazil and China, has increasingly shifted towards developed countries. There is also a notably growing presence of Asian investors (such as China and Korea) in Latin America and Africa, even though the reverse is not true.

Emerging Market Multinationals have made it to the top

Emerging market multinationals that are behind the radical change in the global FDI landscape have not only significantly increased their investment abroad, they have also made it to the top. This is illustrated for instance by the evolution of the Fortune Global 500 list, one of the oldest rankings by revenues of global companies. About 30% of the Fortune Global 500 enterprises for instance are from the E20 today; they were less than 10% ten years ago.

Here again, as in the case of OFDI flows, the Chinese lead the trend. However, although among emerging economies, enterprises from China dominate the ranking, a wide array of E20 countries are represented (14 in total), some of them with only one entry in the list. By decreasing order of importance, the new players are coming mostly from China, Korea, India, Brazil, Russia, Mexico and Indonesia.

While the Global Fortune 500 companies overall are from a diverse group of industries, those from the E20 are more concentrated: seven industries in particular (Petroleum refining; Mining, Crude Oil Product; Commercial and Savings Banks; Metals; Motor Vehicles and Parts; Energy; and Engineering and Construction) are represented, accounting for more than 60% of all the E20 eMNCs. It is also interesting to note that there is a relatively marked “winner take all tendency” in emerging markets. For instance, the Fortune Global 500 top 10 companies of the E20 concentrate a large share of revenues and profits (respectively 29 and 40 % of the total revenues and profits of the largest 100 firms in the E20).

Not only has the presence of emerging market firms in the Global 500 substantially increased, another development has also progressively taken place: a change of guard at the very top. Indeed, a number of the new players have now become world industry leaders. If we consider, for instance, the five top leaders of eight industries (Banking, Logistics, Automobile, Telecom, Engineering & Construction, Petroleum Refining, Mining, Crude Oil Production and Metals), 40% of these leaders were firms from E20 countries in 2015 (largely dominated by China); there were none in 2004.

Remarkable inroads, but still some way to go

Emerging Market Multinationals have made remarkable inroads as global corporations, becoming world leaders as measured by revenues. In terms of profits, market capitalization and international presence, however, they still have some way to go compared to the more established western multinationals.

Overall, the average profit margins of eMNCs lag behind that of their US and Japanese counterparts for instance. Emerging Multinationals appear to be looking for growth in revenues rather than profit margins for the moment. The differences are relatively significant, whether one considers the E20 firms as a whole (27% of the eMNCs in the Fortune Global 500 achieve a profit margin above 5% versus 39% if one considers the whole Fortune Global 500) or at the industry level. There are, however, some notable exceptions such as Chinese firms in Banking and Korean ones in Automobiles.

As regards market capitalization, the gap between older/western and newer/emerging multinationals has become wider. While there are today twenty-seven eMNCs among the 100 largest firms by revenues, there are only seventeen by market capitalization. Emerging multinationals display a lower market capitalization on average than, for instance, US firms. Whether eMNCs will manage to close this gap remains to be seen because of the different financial cultures and contexts in which they operate. Indeed, while stock markets are the main source of corporate finance in, for instance, the United States, most eMNCs rely more on corporate debt than equity finance.

Regarding geographical expansion, emerging market multinationals are not as international as leading American and Japanese companies for instance, but they are becoming increasingly so. European and American companies dominate the UNCTAD list of top 100 firms ranked by foreign assets but, if we consider the number of countries in which firms are present, the picture is different. For American companies, that number on average is triple that of Chinese firms; the difference is much less with the rest of Emerging Multinationals. In addition, the difference is also less marked between the very top US and Chinese multinationals. Overall, unlike what is quite commonly thought, the global footprint of Emerging multinationals is larger than expected and this will most likely continue to grow in the future.

China – An Emerging Global Acquirer

The emergence of China as a significant global acquirer is another distinctive feature of the new global FDI landscape; the surge was particularly marked after the Global Financial Crisis. While in 2000 China virtually had no outbound M&A, the value of its announced outbound M&As reached $138 billion in 2015, placing it in 5th position in the world between Singapore ($121 billion) and Netherlands ($171 billion), but still far behind the U.S. ($488 billion). This surge in M&A activity has been fueled, in particular, by technology and knowledge-driven acquisitions in developed markets, as well as natural resource driven acquisitions in Latin America and other parts of the world. The geographic distribution of Chinese outbound M&A, in fact, has shifted significantly towards Europe and Latin America in the post-financial crisis period. Not only has the overall amount of announced M&A transactions by China increased substantially, available information also suggests that the deals have been on average bigger and more expensive, with for instance Chinese firms willing to pay a premium on average higher since 2009 than in the pre-financial crisis period (2000-2008). Very recent developments suggest that the M&A drive of Chinese firms may be not be over soon.

The very top Chinese firms, such as the largest one in the Banking, Petroleum, Automotive and Metal industries for instance, have been quite active in overseas M&As. Interestingly, relative to their US counterparts, these firms, while still much younger and (directly or indirectly) state-controlled, are comparable in terms of total assets, revenues and market capitalization. Partly through increased M&A activity, they have acquired a global presence that is also on a par with top global MNCs in the United States.

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OECD contribution on “Expanding Business through Regional Integration in Asia”

Strengthening regional integration and economic community initiatives is essential to support growth and development. It increases market size, spurs innovation, investment and job creation and enhances macroeconomic stability through policy coordination.

Focusing on Southeast Asia, China and India, with a particular focus on the ASEAN Economic Community, the OECD contribution on “Expanding Business through Regional Integration in Asia” offers insights, and policy recommendations from the business sector, on the trade and investment implications of enhanced economic integration. It highlights that, even in the context of a Chinese slowdown, enhanced regional ties in Asia can still generate significant opportunities for private sector growth. The ASEAN Economic Community (AEC) in particular has the potential to support higher trade and investment in the region. This process can be particularly beneficial for multinational corporations from emerging Asia: due to geographical proximity and familiarity with the regional context, they have the potential to enjoy higher market penetration and lighter cost structure than their competitors from developed economies. Challenges however remain, in areas such as trade and non-tariff barriers, human resources development, infrastructure and connectivity. Although regional ties have been significantly enhanced in the region since the 1980s, additional policy efforts are required to fully achieve integration targets.

Chapter 1

E20 The New Heavy Weights

Emerging markets have gained significant ground since the start of the new millennium. In particular, they attracted significant attention during the Global Financial Crisis and the ensuing economic recession, to which they proved more resilient than the major economies in the developed world. In the past twenty years, emerging markets have enhanced economic growth, deepened integration in international markets, and expanded innovation and technology capabilities. This growing influence has provided them with increasing leverage over the world economy. While emerging markets may now face greater hardships, their ongoing endurance suggests that they will remain consequential protagonists of present and future global trends, as well as a challenge to traditional economic powers.

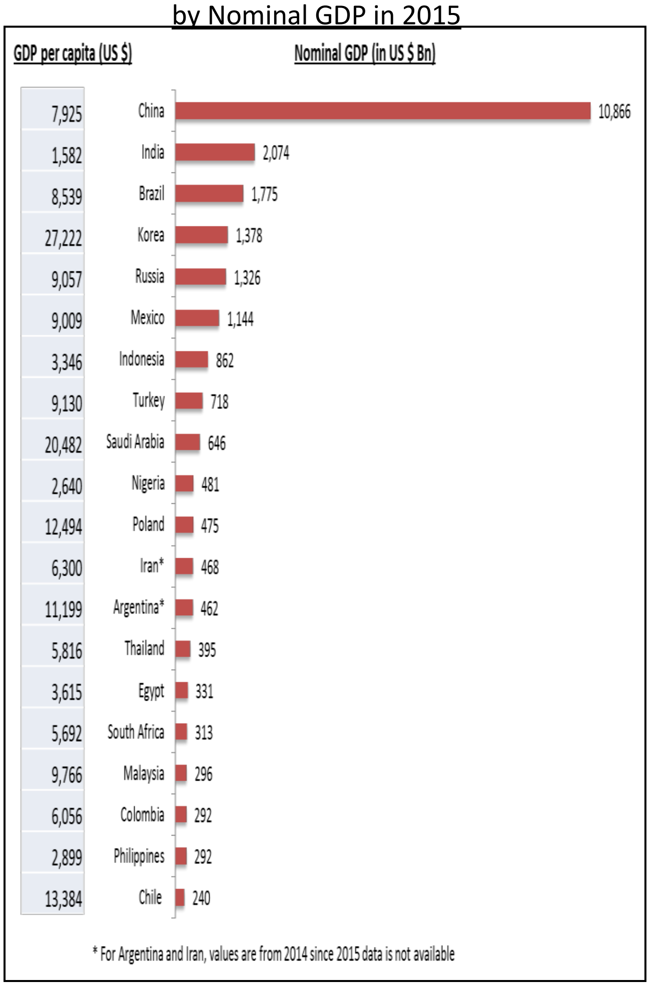
Emerging markets are one of the hallmarks of today's global economy. They have become a hot topic among businesses, policy makers, international organizations, research institutions and others since the beginning of the new millennium.

The term "emerging markets" was coined in 1981 by Antoine van Agtmael, an economist at the IFC.[1] It was used by fund managers to describe equity, bond, or currency markets mainly in developing countries with not only strong growth potential, but also high risk and volatility. Initially a mostly finance and investment related category, the term evolved into a broader economic concept for comparing and grouping together diverse types of countries or economies.

Today, "emerging markets" and "emerging economies" are often used interchangeably, which can be a source of confusion.

There is no agreed upon definition of emerging markets or economies. Nevertheless, the term commonly refers to countries or economies that are in a transitional phase with the potential to become significant players in the global landscape. Criteria referring to the wealth of an economy, its growth trajectory, the state of its financial markets, and even its political system and institutions are considered on different occasions in various definitions. This report defines an emerging economy on the basis of the following distinctive features: (1) its level of development, (2) its upward trajectory towards a mature stage of development, (3) its increased integration in the world economy (through trade and FDI in particular), and (4) its potential to play a significant role in the global economy.

Figure 1: The E20 Emerging Economies – Ranked by Nominal GDP in 2015



Source: Based on data from the World Bank (World Development Indicators) http://databank.worldbank.org/data/home.aspx (accessed July 2016)

As can be seen from the various groupings offered by analysts over the years, emerging economies—irrespective of definition—are quite diverse. Indeed, a number of phrases and acronyms have been used to designate specific groups within the category of 'emerging economies,' including BRIC (Brazil, Russia, India, China), which appeared in 2001,[2] later to become the BRICS with the inclusion of South Africa; the Next Eleven (Bangladesh, Egypt, Indonesia, Iran, Korea, Mexico, Nigeria, Pakistan, Philippines, Turkey and Vietnam) in 2005; [3] and the CIVETS [4] (Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa) in 2009, to name a few.[5]

A number of market research institutions and international organizations also classify countries as emerging markets or economies, each setting up their own list as illustrated below (see Table 1 in Annex). Some countries appear in several lists. For the purpose of this study, we used these lists as a basis and considered the size (as measured by nominal GDP) and weight (in terms of demography) of each economy to draw a list of the top 20 emerging economies – the E20 (Figure 1)[6]. The E20 includes 18 developing economies[7] from Africa, Asia and Latin America, the total of which represents about two-thirds of all developing economies' Gross Domestic Product (GDP), as well as Poland and the Russian Federation. Altogether, in 2015, the E20 accounted for 46% of the world GDP on a PPP basis. The reports draws on the E20 grouping to illustrate the emerging markets phenomenon.

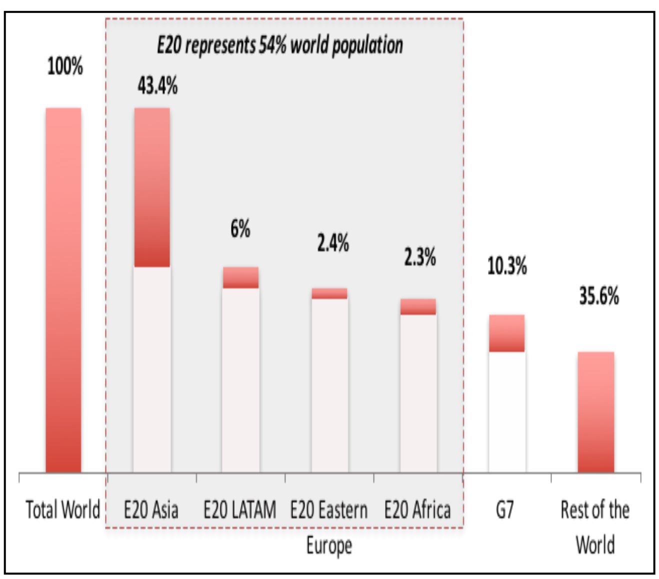
As we shall see, emerging markets and E20 in particular have become the 'new heavyweights' of the world economy. They display a number of features (such as demographic and economic; soft power attributes; as well as others related to technology, innovation and education) that have contributed to their new positioning globally.

1.1 - Demographics: A Fundamental Parameter

Emerging economies are endowed with a large and growing population. With close to four billion people, the E20 accounts for more than half of the world population today[8] (Figure 2). By comparison, only 10% of the world population lives in the G7 countries[9] and 17% in the OECD countries.[10] While the population of G7 countries has increased at a annual rate of 0.51% since 2000, that of the E20 countries rose annually by 1% over the same period.

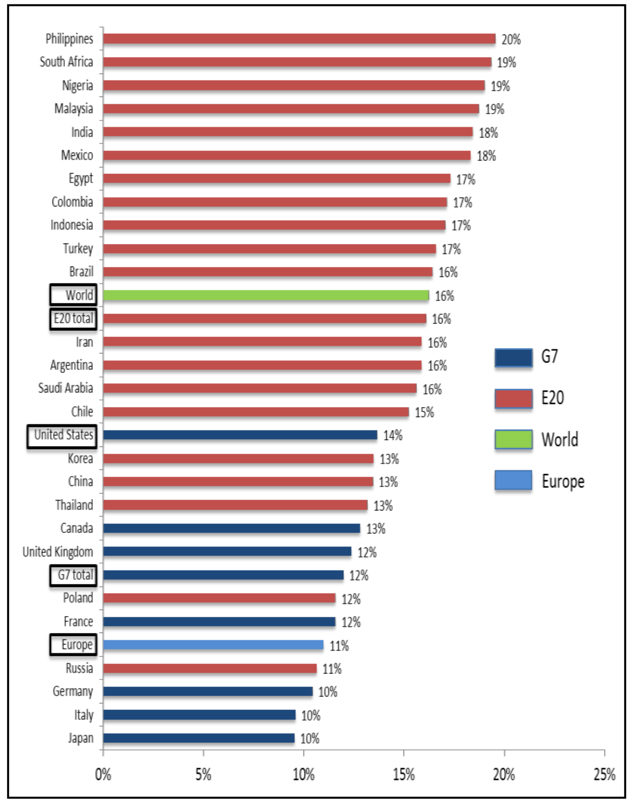
A young population characterizes the demography of E20 emerging economies (Figure 3).
Indeed the share of the youth (defined as 15-24 years of age) in the E20 population reaches 16%, compared to 12% in the G7, 14% in the USA and 11% in Europe.[11] While a young population implies higher budget expenditures, in education for instance, it is also a source of untapped wealth, by enlarging the pool of skills potentially available, as well as the size of the

Figure 2: Population Comparison - E20 vs. G7, UNDESA, World Population Prospects 2015



Source: Authors' calculation based on data from UNDESA (Population Division), World Population Prospects 2015 https://esa.un.org/unpd/wpp/ (accessed March 2016)

Figure 3: Share of Youth in the Population of E20 and Selected Countries



Note: population estimates as of July 2015
Source: Based on data from UNDESA (Population Division), *World Population Prospects 2015* (https://esa.un.org/unpd/wpp/ - accessed March 2016).

workforce and the potential consumer market. In the medium term, a young population can be a positive growth factor.

Indeed, demographic dynamics in the E20 are characterized by an increasing proportion of working

Table 1: E20 and G7 – Percentage of Working Age Population

	E20						G7		
	Latam	Eastern Europe	Africa	Asia	West Asia	E20	G7	United States	Japan
1964	53.2%	63.1%	54.7%	55.1%	52.4%	55.5%	63.2%	60.12%	67.32%
1974	54.6%	67.4%	54.4%	55.6%	53.8%	56.2%	64.3%	63.97%	67.96%
1984	57.4%	66.9%	53.9%	60.3%	54.3%	59.9%	67.0%	66.38%	67.90%
1994	61.2%	66.0%	54.8%	63.0%	56.9%	62.3%	67.0%	65.58%	69.71%
2004	64.7%	70.4%	57.5%	66.9%	65.6%	66.3%	66.8%	67.07%	66.77%
2014	67.4%	70.3%	57.7%	69.3%	69.0%	68.3%	65.0%	66.55%	61.36%

Source: Authors' calculation based on data from the World Bank (Health Nutrition and Population Statistics: Population Estimates and Projections) age people[12] relative to the total population, especially since the early 1970s (Table 1). This is in sharp contrast with the situation in some of the major developed economies such as Japan, the EU, and to a lesser extent, the United States.

A large proportion of the working age population can have a significant positive impact on growth (the so called "demographic dividend"). However, this is not automatic: it needs to be accompanied by adequate levels of education and health.

It is interesting to note that for a few major members of the E20, the population age structure has begun to change in recent years. In China, for instance, the population is rapidly aging: today about 15% of the population is above 60, but if present trends prevail, this ratio will reach 25% by 2030 (it was 7% in 1980)[13]. Korea is faced with an even more acute situation, with more than 30% of its population expected to be older than 60 by 2030[14]. The impact of these changes on the economy is not yet clear: the needs of this ageing population will have to be taken care of, which means not only increased additional social expenditures, but also the development of new activities. That being said, in the medium term, the share of the working-age population of the E20 countries will continue to exceed that of the major developed economies: projections indicate that by 2050 this share will still be above 66 percent for the E20 and less than 60 percent for the G7 (Table 2).

Thanks to their demographic characteristics, E20 economies represent a significant potential consumer market. While global consumer demand used to be concentrated in developed countries, a new middle class has been developing in emerging economies and is expected to play an increasing role in global consumer spending. Middle class consumer spending in North America and Europe, for instance, accounted for almost two-thirds of global consumer spending in 2009. This could well fall to only 30 per cent by 2030, as a result of a significant shift towards emerging economies, especially in Asia.[15]

1.2 - Economic Performance

Comparing the economic growth of the E20 and the G7 reveals substantial differences. While the GDP of the E20 at Purchasing Power Parity (PPP) grew at an average annual rate of 7.4% over 1995-2015, that of the G7 grew much more slowly, at about 3.6% over the same period. As a result, the contribution of the E20 to global GDP increased substantially: in about 15 years, its share in global GDP rose by 15 percentage points, reaching in 2015 almost half of world GDP (46% - GDP at PPP) (Figure 4). By contrast, the contribution of the G7, though still significant at 31%, is much lower today than at the turn of the century. In this respect, the global financial crisis has been a turning point (as Figure 4 illustrates).

Today, based on Nominal GDP, nine emerging economies are among the twenty largest in the world compared to only seven twenty years ago (Figure 5), with the E20 represented in the top ranks by China (2), India (7) and Brazil (9). On GDP (at PPP), China is ranked first, while twelve emerging economies feature among the twenty largest (Figure 6).

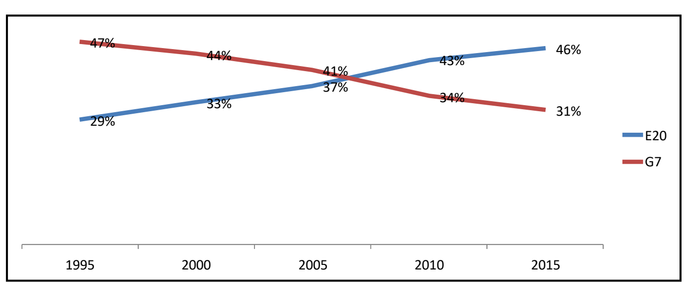
Table 2: E20 and G7 – Percentage of Working Age Population Projections

	E20						G7		
	Latam	Eastern Europe	Africa	Asia*	West Asia	E20*	G7	United States	Japan
2020	68.2%	66.5%	57.9%	68.6%	69.0%	67.6%	63.2%	64.71%	58.94%
2030	68.0%	64.3%	58.7%	68.2%	69.5%	67.3%	61.7%	62.86%	58.17%
2040	67.5%	63.8%	60.0%	67.6%	70.1%	66.9%	60.0%	61.11%	57.35%
2050	66.7%	64.8%	61.0%	66.5%	69.9%	66.0%	58.9%	60.60%	55.96%

*Does not include Malaysia as data unavailable

Source: Authors' calculation based on data from the World Bank (Health Nutrition and Population Statistics: Population Estimates and Projections)

Figure 4: Share of Global GDP (at PPP), E20 and G7:



Source: Authors' calculations, based on data from the World Bank *(World Development Indicators)* (http://databank.worldbank.org/data/home.aspx - accessed July 2016)

Figure 5: Twenty Largest Economies in the World, 1995 and 2015 by Nominal GDP

1995 Rank by Nominal GDP	Country	1995 Nominal GDP (in $ Bn)	2015 Rank by Nominal GDP	Country	2015 Nominal GDP (in $ Bn)
1	United States	7,664	1	United States	17,947
2	Japan	5,334	2	China	10,866
3	Germany	2,592	3	Japan	4,123
4	France	1,610	4	Germany	3,356
5	United Kingdom	1,238	5	United Kingdom	2,849
6	Italy	1,171	6	France	2,422
7	Brazil	786	7	India	2,074
8	China	732	8	Italy	1,815
9	Spain	613	9	Brazil	1,775
10	Canada	604	10	Canada	1,551
11	South Korea	559	11	Korea	1,378
12	Netherlands	447	12	Australia	1,340
13	Russia	396	13	Russia	1,326
14	Australia	368	14	Spain	1,199
15	India	367	15	Mexico	1,144
16	Mexico	344	16	Indonesia	862
17	Switzerland	342	17	Netherlands	753
18	Belgium	290	18	Turkey	718
19	Sweden	264	19	Switzerland	665
20	Argentina	258	20	Saudi Arabia	646

E20	G7	Other

Source: Based on data from the World Bank *(World Development Indicators)* (http://databank.worldbank.org/data/home.aspx - accessed July 2016) and EMI analysis

Figure 6: Twenty Largest Economies in the World, 1995 and 2015 by GDP at PPP

1995 Rank by GDP PPP	Country	1995 GDP PPP (in $ Bn)	2015 Rank by GDP PPP	Country	2015 GDP PPP (in $ Bn)
1	United States	7,664	1	China	19,524
2	Japan	2,875	2	United States	17,947
3	China	2,241	3	India	7,983
4	Germany	1,886	4	Japan	4,738
5	India	1,442	5	Germany	3,848
6	Brazil	1,307	6	Russia	3,580
7	Italy	1,247	7	Brazil	3,192
8	France	1,232	8	Indonesia	2,842
9	United Kingdo	1,223	9	United Kingdo	2,692
10	Indonesia	865	10	France	2,651
11	Russia	833	11	Mexico	2,194
12	Mexico	753	12	Italy	2,183
13	Canada	685	13	Korea	1,749
14	Spain	647	14	Saudi Arabia	1,685
15	South Korea	603	15	Spain	1,603
16	Saudi Arabia	486	16	Canada	1,589
17	Iran	481	17	Turkey	1,543
18	Thailand	407	18	Thailand	1,108
19	Australia	379	19	Nigeria	1,092
20	Netherlands	355	20	Australia	1,082

E20	G7	Other

Source: Based on data from The World Bank *(World Development Indicators) http*://databank.worldbank.org/data/home.aspx (accessed July 2016) and EMI analysis

Such changes reflect the strong growth rates registered by emerging economies over the past fifteen years (Table 3), with a number of them exceeding 5 percent, particularly between 2000 and 2015.

In comparison, the growth rates of G7 countries over the same period hovers around 1 to 2 percent, with rare exceptions (see Table 3). The 1995-2015 averages of G7 countries are all below those of countries in the E20, as shown in Figure 7. It is in this context—i.e a relatively long period of strong growth for many emerging economies—that the recent, and in some cases significant, decline in the growth rates of several emerging markets has to be appreciated, taking into account that such declines occur amid a general slowdown in the world economy. The decline has been particularly important in the past two year in Brazil, China, Nigeria and Russia.[16] At the same time, growth rates of about 6% or 7% (as estimated for China and India) and 5% (for Indonesia, Malaysia and Philippines) still compare quite well with levels barely or clearly below 2% in a number of major developed countries.

Vulnerability to external shocks and currency volatility has often characterized emerging markets, as reflected in the various crises that have affected them over the past twenty years: for instance, the Mexican crisis of 1994, the Asian financial crisis of 1997 and the various crises that have occurred in countries such as Russia, Argentina and Brazil since 2000. Whether the recent substantial decline in growth faced by some emerging economies in the E20 will turn into a more severe crisis remains to be seen. But emerging economies—that have achieved a prominent position in the world economy today—are likely to maintain their protagonism.

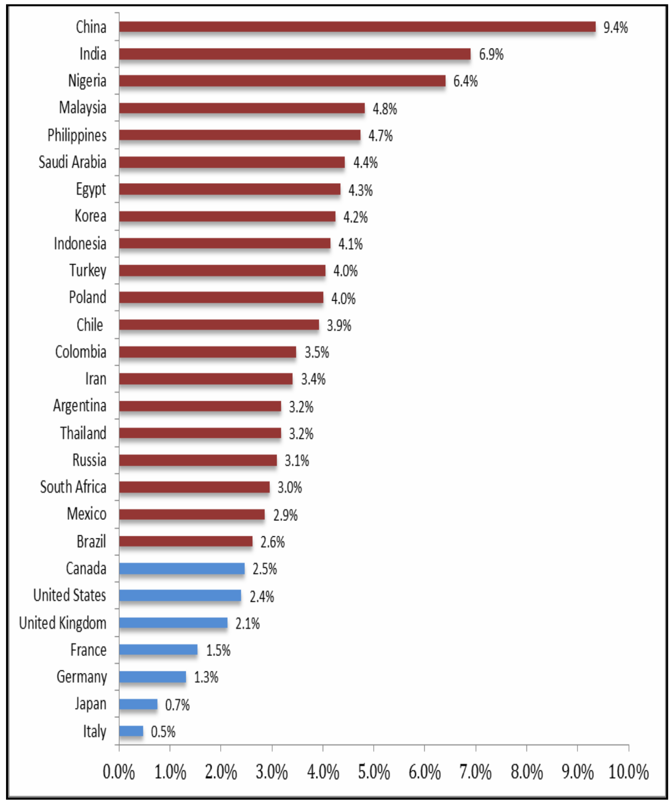
Table 3: E20 and G7 Countries – Growth Rates (Various Periods from 1995 to 2015)

	GDP growth rates*			
	1995-2000	2000-2005	2005-2010	2010-2015
E20				
Argentina	2,58%	1,99%	5,73%	2,46%
Brazil	2,09%	2,95%	4,47%	0,98%
Chile	4,16%	4,20%	3,49%	3,83%
China	8,61%	9,76%	11,26%	7,81%
Colombia	1,21%	3,62%	4,53%	4,59%
Egypt	5,20%	3,53%	6,18%	2,51%
India	6,08%	6,72%	8,08%	6,74%
Indonesia	0,70%	4,73%	5,74%	5,51%
Iran	3,50%	5,50%	4,89%	-0,17%
Korea	5,19%	4,73%	4,11%	2,96%
Malaysia	4,79%	4,74%	4,48%	4,38%
Mexico	5,09%	1,64%	1,60%	2,84%
Nigeria	3,25%	10,59%	7,21%	4,70%
Philippines	3,56%	4,59%	4,93%	5,86%
Poland	5,41%	2,97%	4,72%	2,94%
Russia	1,62%	6,13%	3,54%	1,17%
Saudi Arabia	2,57%	4,90%	5,30%	5,00%
South Africa	2,79%	3,83%	3,10%	2,09%
Thailand	0,72%	5,44%	3,74%	2,85%
Turkey	3,36%	4,55%	3,19%	4,39%
G7				
Canada	4,02%	2,57%	1,14%	2,13%
France	2,91%	1,66%	0,77%	0,85%
Germany	1,92%	0,57%	1,23%	1,52%
Italy	2,00%	0,94%	-0,31%	-0,72%
Japan	0,84%	1,20%	0,34%	0,61%
United Kingdom	3,21%	2,81%	0,39%	2,10%
United States	4,30%	2,53%	0,76%	2,03%

** Based on GDP, constant, in local currency*
Source: Authors' calculation, based on data from the World Bank (World Development Indicators)
http://databank.worldbank.org/data/home.aspx (accessed July 2016) and EMI analysis

Figure 7: Growth Rates 1995-2015*

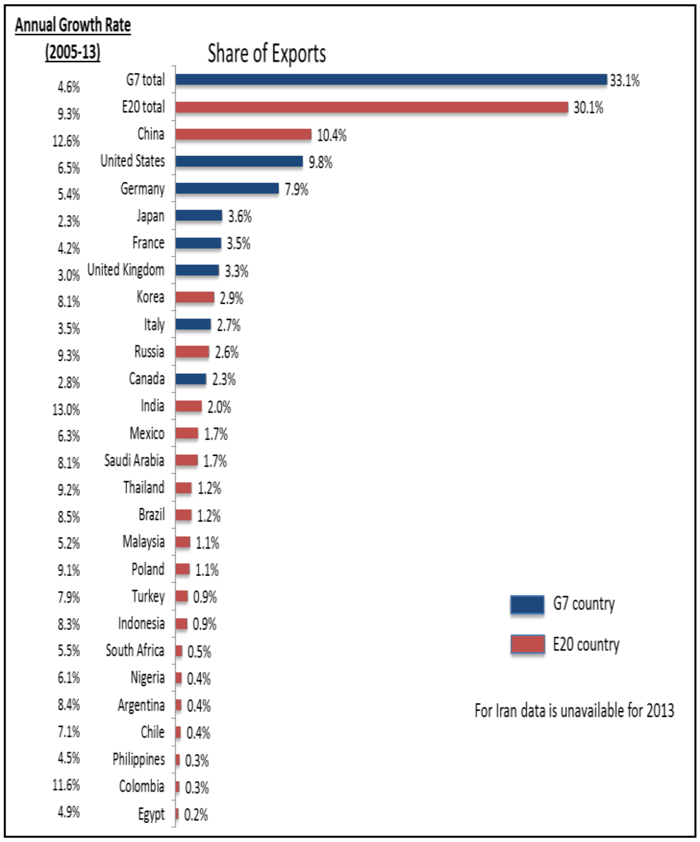
The share of E20 in world trade and global Foreign Direct Investment (FDI) further illustrates the



** Based on GDP, constant, in local currency*
Source: Authors' calculation, based on data from the World Bank (World Development Indicators)
http://databank.worldbank.org/data/home.aspx (accessed July 2016) and EMI analysis

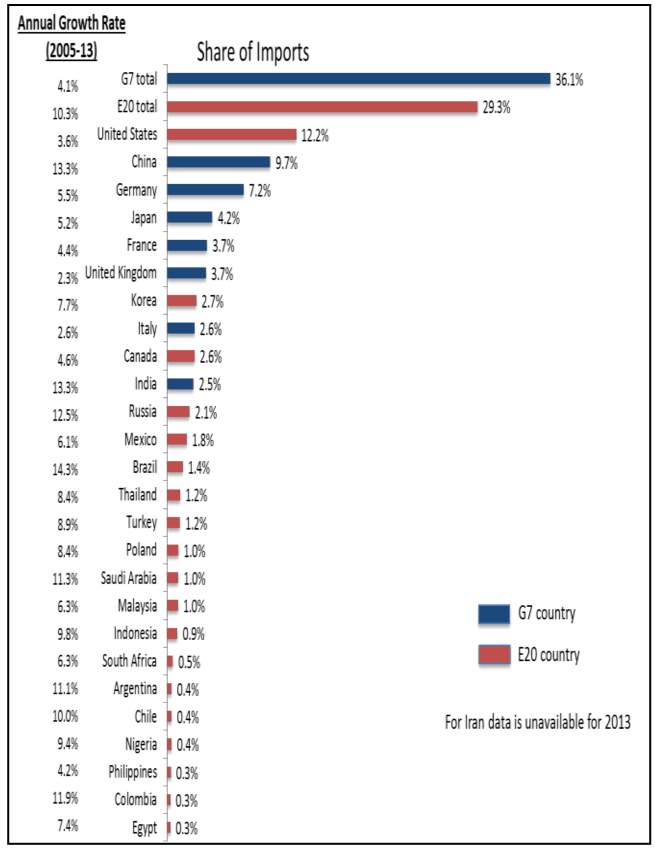
increased weight of emerging markets in the world economy. In the past two decades, for instance, E20 countries increased their share in world exports from about 11% to 30% (Figure 8).[17] While for some of them commodities remain a key export, for others, such a trend reflects significant progress in manufacturing output and exports, including high-tech products. Of the fifteen largest countries by manufacturing added value, eight are E20 emerging countries. [18] In China, Korea, and Malaysia, high-tech products account for 26%, 27% and 43% of total manufacturing exports [19] respectively. A similar trend has taken place with imports: the E20 accounts today for about 29% of

Figure 8: Share of World Exports 2013



Source: Based on UNCTAD Statistics - International Trade (http://unctad.org/en/Pages/Statistics.aspx - accessed in May 2016)

Figure 9: Share of World Imports 2013



Source: Source: Based on UNCTAD Statistics - International Trade (http://unctad.org/en/Pages/Statistics.aspx - accessed in May 2016).

world imports, almost twice its share twenty years ago (Figure 9).

Meanwhile, the E20 have become major recipients of FDI (receiving about a third of FDI flows over the past five years) and are increasingly investing abroad. They are home to some of the largest multinational companies (see chapters 2 and 3).

The growth performance of the E20 and their increased integration in the world economy have been accompanied by the development of their technology and innovation capabilities, as well as by efforts to enhance the quality of human capital, particularly through education.

1.3 - Emerging Markets Move Ahead in Technology and Innovation

Technology and innovation are key drivers of growth and development. This has become even truer in the knowledge economy that has been developing over the past decades. For some two centuries, technology and innovation had been largely associated with the developed world. However, in recent decades emerging economies have increasingly paid attention to technology and innovation, increasing, for instance, their investment in R&D and developing specific national innovation policies. A number of them have also made substantial advancements in education and are beginning to lead innovation in some specific areas, especially those developed in response to the specific demands and needs of their population.

This change in the global technology and innovation landscape is reflected in global innovation indexes (as well as in some telling examples) and in more specific indicators on R&D and education expenses, patents or key infrastructure such as ICT. These are examined in the following sections.

A) Innovation: A Changing Geography

A number of indicators and examples suggest an evolution in the geography of global innovation, as does for instance the Global Innovation Index[20] —an indicator that assesses and compares the performances of 128 countries in innovation. Today, seven E20 countries are featured in the top 50 positions in the ranking of the Global Innovation Index. [21] The best ranked among them are at the heels of—or have even surpassed—some developed countries: Korea and China for example are ranked 11th and 25th respectively, compared to Netherlands (number 9), Germany (number 10), Canada (number 15), Japan (number 16), France (number 18) Spain (number 28) or Italy (number 29) to name a few[22]. In some industries (solar panels, aeronautics, medicine, genetic engineering, phyto pharmacy or super-computers), a number of emerging economies now attain leading positions.[23]

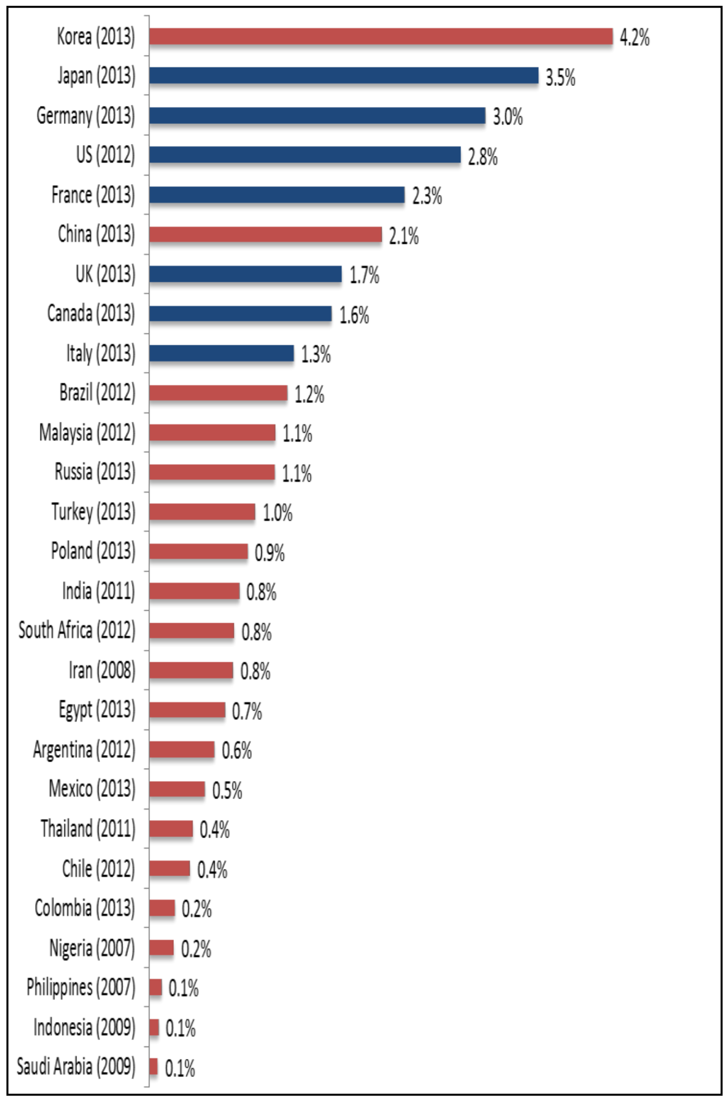
The increased participation of emerging economies in innovation has begun to change its nature. Indeed, in many cases, innovation in emerging economies has been driven by the need to respond to local needs that are often quite different from those prevailing in developed countries. Mobile banking—which in many countries enables a population deprived of banking services to access them—is one well-known example, but other IT based developments in agriculture or fishery [24] are no less important. Urban development—and its associated In such cases, innovations are not only new to the country – or the market; they are new to the world and likely to further disseminate: they contribute to a new geography of global innovation where emerging economies are becoming significant sources of innovation and technological development.[25]

B) Research and Development (R&D) Expenditure

Public and Private R&D expenditure as a share of GDP is the most common and widely available technology and innovation related indicators. While acknowledging its shortcomings, it provides a first indication of the R&D efforts made by countries.

Although there is still room for improvement as to the level of the R&D to GDP ratio, some emerging economies have significantly increased their R&D expenditures. Korea leads the way with an R&D

Figure 10: E20 & G7 R&D Expenditure (% GDP) in 2013 or latest available data

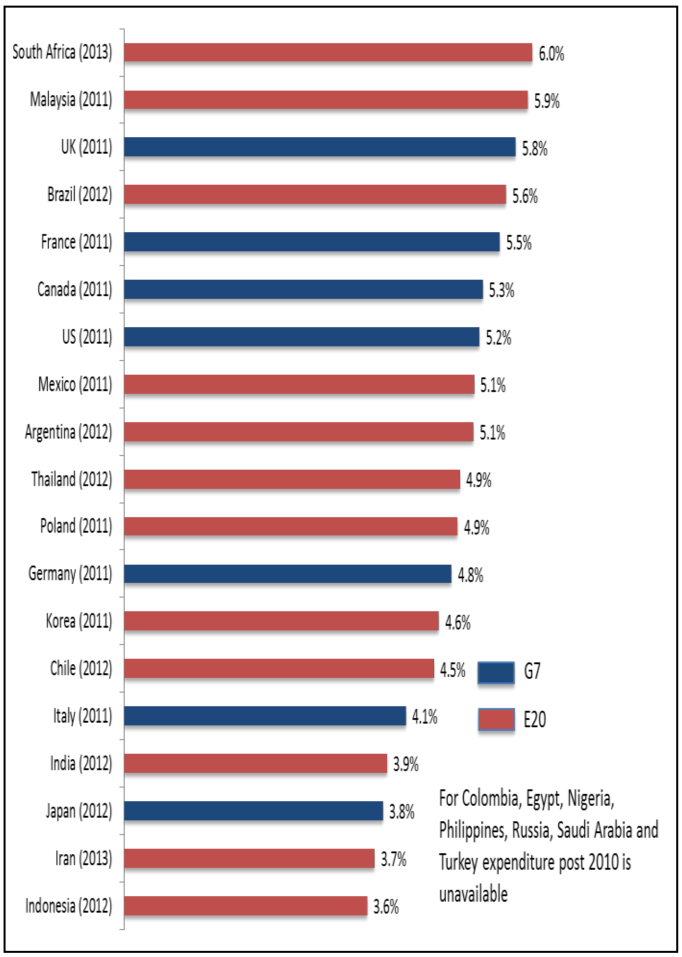


Source: Authors' analysis based on data from UNESCO statistics, UIS Stat, http://data.uis.unesco.org/ (accessed in July 2016) intensity ratio of 4.15. China is worth noting: it has registered a significant rate of increase in its R&D expenditure (multiplying nearly five-fold in the course of a decade) and in its ratio to GDP (virtually doubling to 2 percent in a decade) [26]. China has become the country with the second largest R&D expenditures in the world. Malaysia and Turkey tripled their R&D expenditures (in constant prices), and doubled their GDP ratios in ten years.[27] Figure 10 provides the ratio of R&D expenditure to GDP for the E20 and G7 countries.

C) Expenditure on Education and Quality of Human Capital

Over the last couple of decades, a number of emerging markets have been striving to develop skills and talent through education policies, often centered

Figure 11: Expenditure on Education (% GDP) 2013 (or latest available data)



Source: Authors' analysis based on data from World Bank (World Development Indicators) http://databank.worldbank.org/data/home.aspx (accessed July 2016)

on free education for all (at least at the primary level) and supported by relevant increases in public spending on education. Figure 11 compares expenditures on education in the E20 with those of some major developed countries.

A number of E20 economies have allocated a significant portion of their GDP towards education, including South Africa (6%), Malaysia (5.9%), Brazil (5.6%), Argentina and Mexico (5,1%). These percentages are higher or similar to those prevailing in G7 countries. Some heavily populated E20 countries, however, still find it difficult to surpass the 5% threshold, including India (3.8%), Indonesia (3.6%) and Pakistan (2.5%).

An educated workforce is a key ingredient for sound and sustainable growth. In a number of emerging markets, there has been a significant increase – sometimes a mass movement – in access to secondary education and university, reflecting the efforts made to enhance skills and talent,[28] as illustrated in Tables 4 and 5.[29]

D) Patents filings

Patents also provide an indication of the innovation capabilities of a country, reflecting to some extent the results of its efforts in innovation and technological development. While data in this area must be interpreted with caution, trends in the share of patents filed in the world suggest that countries in the E20 are beginning to catch up with regards to innovation.

As illustrated in Figure 12, there was a large gap between G7 and E20 countries in patent filing, with the former granting 61%, and the latter only 15% of the patents in 1994. By 2004, the gap between both groups of countries had begun to decrease.

It is however during the past decade that a real decline in this gap has taken place: in 2014, the shares

Table 4: E20 – Tertiary Education Enrollment Ratios –Trend (1994-2013)

Gross Enrollment Ratio-3°	1994	1999	2004	2009	2013
China	3.7	6.5	17.9	22.5	30.2
Brazil	..	..	..	..	..
India	..	..	11.0	16.1	23.9
Russia	44.5	51.9	70.6	75.4	78.0
Korea	45.0	73.9	91.0	98.0	97.0
Mexico	13.3	17.9	22.6	25.2	29.2
Indonesia	10.5	14.7	16.6	23.1	31.3
Turkey	20.0	23.5	30.6	46.2	79.0
Saudi Arabia	14.1	20.6	29.1	31.0	54.9
Nigeria	..	6.1	9.9	..	..
Poland	27.7	45.7	60.7	70.8	71.2
Argentina	36.8	48.0	65.2	70.5	80.0
Iran	..	19.1	21.8	36.4	57.8
Colombia	16.2	22.2	26.6	37.1	50.1
Thailand	..	32.7	41.9	48.8	51.4
South Africa	15.0	..	..	..	19.7
Malaysia	10.3	22.7	30.0	35.7	38.5
Egypt	..	30.7	28.5	29.9	30.3
Philippines	..	28.7	28.3	28.7	33.6
Chile	27.5	37.3	44.8	61.9	83.8
Canada	89.6	60.0	..	..	..
France	49.5	54.1	55.2	54.9	62.1
Germany	42.2	..	..	..	61.1
United Kingdom	42.8	60.2	59.4	58.2	56.9
Italy	40.1	48.3	61.8	66.8	63.5
Japan	38.7	46.6	53.6	57.7	62.4
United States	78.3	72.2	81.5	88.6	88.8
World	14.9	18.3	23.4	27.9	32.9

Source: Authors' analysis based on data from World Bank (World Development Indicators) http://databank.worldbank.org/data/home.aspx (accessed July 2016)

Table 5: E20 – Secondary Education Enrollment Ratios[31] –Trend (1994-2013)

Gross Enrollment Ratio-2°	1994	1999	2004	2009	2013
China	47.4	61.3	..	80.6	96.2
Brazil	..	..	..	..	..
India	45.8	43.2	51.6	59.8	68.9
Russia	90.7	92.4	85.3	85.0	98.8
Korea	99.0	99.1	90.2	98.2	99.4
Mexico	54.5	67.5	78.6	82.6	87.0
Indonesia	44.8	54.4	61.9	74.7	82.5
Turkey	58.6	70.8	86.2	79.9	114.6
Saudi Arabia	..	..	..	95.7	107.7
Nigeria	..	23.4	34.8	38.9	..
Poland	96.5	98.5	96.3	96.7	108.7
Argentina	68.7	84.9	85.2	87.5	106.3
Iran	68.2	78.0	76.3	82.8	86.6
Colombia	60.3	70.5	78.7	99.2	..
Thailand	42.6	..	66.9	80.9	86.2
South Africa	79.6	90.8	88.5	90.2	98.2
Malaysia	55.2	66.4	72.0	65.5	71.1
Egypt	74.7	79.1	80.8	68.8	86.0
Philippines	76.0	74.4	83.3	84.3	88.4
Chile	..	83.4	95.4	94.2	100.5
Canada	105.2	101.9	..	102.7	..
France	114.2	109.6	107.9	111.2	110.9
Germany	105.7	99.1	102.4	103.3	102.5
United Kingdom	102.7	101.2	104.6	99.4	124.4
Italy	87.6	91.6	98.0	100.7	102.4
Japan	101.0	101.2	101.2	100.9	101.9
United States	96.5	94.0	95.5	95.4	95.9
World	56.0	58.9	62.8	69.2	75.2

Source: Authors' analysis based on data from World Bank (World Development Indicators) http://databank.worldbank.org/data/home.aspx (accessed July 2016)

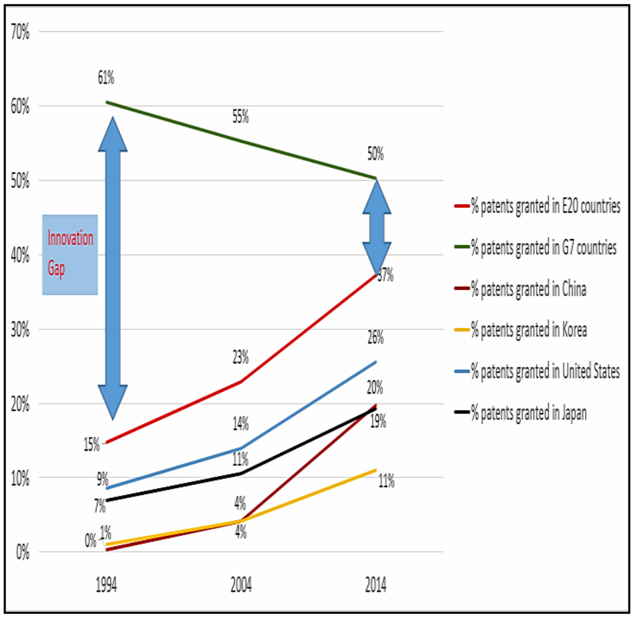
of the E20 and the G7 in world patent filing were 37% and 50%, respectively. China and Korea have led the trend, accounting for 20% and 11% of all patents, respectively. Other countries such as India, Russia, Mexico or Iran have also seen an increase in the number of patents filed, but the absolute numbers are still far below those of China and Korea (see Table 2 in Annex to this chapter). As to developed countries, the United States remains in the lead.

E) The Role of Information and Communication Technologies (ICT)

Information and Communication Technologies (ICT) have become a critical engine of growth.[30] They are key to the development and dissemination of technology and innovation, and to the leveraging of the benefits of international integration.

Interestingly, many emerging countries have more Internet and mobile technology users than the global average (Figures 13 and 14) and have been experiencing high penetration growth rates in the recent past. Although Internet penetration remains uneven, access to mobile telephones has been a major boost to development in the E20, including by facilitating greater and more productive entrepreneurial activity as well as the provision of basic public services like health and education to their populations.

Figure 12: Percentage of Patents Granted in E20 and G7 countries in 1994, 2004 and 2014



Source: Authors' analysis based on data from WIPO Statistics Database http://ipstats.wipo.int/ ipstatv2/index.htm?tab=patent - accessed July 2016).

Significant efforts are also underway to further develop broadband infrastructure, which is key to fully leverage ICT for economic growth and social development. Over the past few years, all E20 economies have adopted broadband plans and strategies.[32]

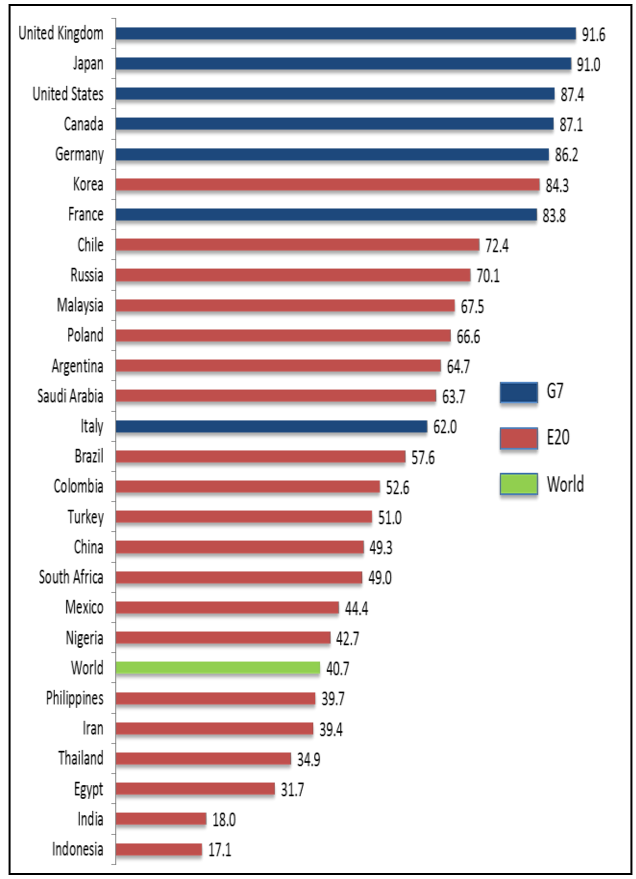
Broadband penetration in these economies has increased over the years and is higher than the world average, but there is still a gap compared with developed economies (Figure 15).

1.4 – Beyond economic power

Other developments, in the area of global governance and international cooperation in particular, are signs of the growing influence of emerging economies, enhancing their ability to exercise soft power on a global scale.

Already by the turn of the century, the creation of the G20 was a first recognition of the change taking place in the global economic and political landscape.

Figure 13: Internet Penetration per 100 Inhabitants in G7 and E20 countries, 2014

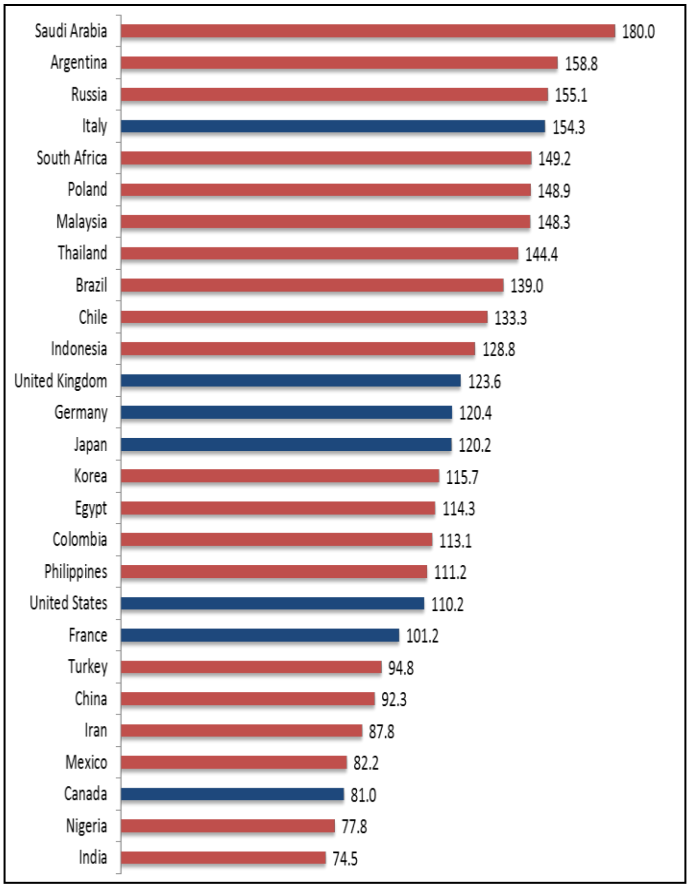


Source: Authors' analysis based on data from the World Bank (World Development Indicators) (http://databank.worldbank.org/data/home.aspx -accessed July 2016)

Since then, with the BRICs summits in particular, some of the most prominent among the emerging economies have been aiming to expand multilateral cooperation. More recently, the establishment of new developmental institutions—such as the Bank of the South in 2009, the New Development Bank (NDB) in 2014[33] and the Asian Infrastructure Investment Bank (AIIB) in 2015—illustrate their aspiration to play a greater role on the world stage through development finance and cooperation (Table 6). In these institutions, the power

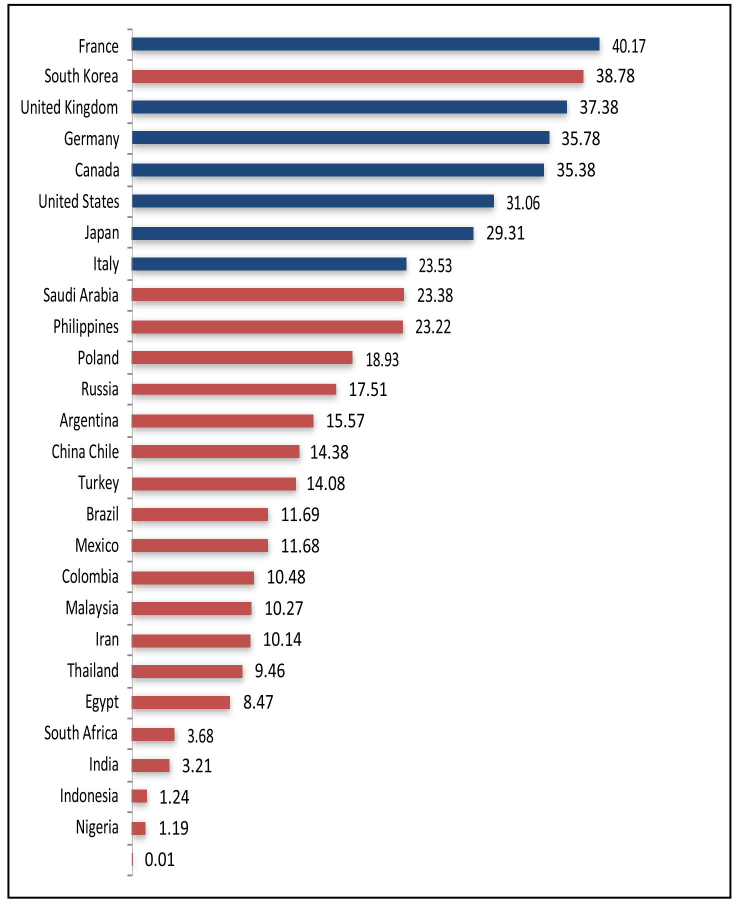
structure is quite different from the one prevailing in post-WWII development organizations. For instance, China, followed by India and Russia, are the three largest contributors to the Asian Infrastructure Bank, which counts 57 members, including four G7 countries. [34] The "One Belt, One Road" Initiative proposed by China, which is designed for economic

Figure 14: Mobile Telephone Subscriptions per 100 Inhabitants in G7 and E20 Countries, 2014



Source: Authors' analysis based on data from the International Telecommunications Union Statistics (http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx - accessed in May 2016).

Figure 15: Fixed Broadband per 100 Inhabitants in G7 and E20 Countries, 2014



Source: Authors' analysis based on data from the International Telecommunications Union Statistics (http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx - accessed in May 2016).

cooperation and integration among countries around the original silk road and the 21st century maritime silk road, is another example of initiatives likely to expand China's role in global and regional affairs. [35] The development of these new multilateral institutions and initiatives may also well contribute to enhancing the role of the renminbi in international trade and investment.

The recent quota and governance reforms that have been approved by the IMF in January 2016 also reflects the new dynamics of the global economy – including the role of emerging economies. It strengthens their representation in the IMF's governance structure. As a result, emerging economies such as Brazil, China, India, and Russia are now among the 10 largest shareholders of the IMF.

The inclusion of the renminbi in the Special Drawing Rights (SDRs) currency basket – an exceptional development given that no new currency had been introduced in the basket since 1999 [36] – is also particularly noteworthy.[37] Replacing part of the shares

Table 6: Selected Emerging Markets focused organizations

Organization	Launch year	Mission	Member nations
Bank of South	2009	Lend money to nations in the Americas for social programs and infrastructure.	Argentina, Brazil, Paraguay, Uruguay, Ecuador, Bolivia and Venezuela.
New Development Bank	2015	Foster greater financial and development cooperation among the BRICS nations	Brazil, Russia, India, China and South Africa
Asian Infrastructure Investment Bank	2014	Provide finance to infrastructure projects in the Asia Region	57 members from, Africa, Asia, Europe, Oceania, and Latin America

accounted for by the Euro, the UK pound and the Japanese yen in the IMF currency basket, the renminbi will be the third largest currency in that basket, after the US dollar and the Euro. The reserve currency status of the renminbi may well lead to significant changes in the international financial system, especially if the new reserve currency is seen as an alternative to the dollar in some parts of the world. While the full impact of this move on the currency and the global financial system is yet to be fully assessed,[38] it is clear that it has provided China with a new international status.

Why and How E20 counts and Will Continue to Count

Over the last two decades, emerging economies, considered here through the experience of the E20, have enjoyed a period of remarkably strong and steady growth. Recent 'slow downs' remain relative, even when they are significant, and sometimes combined with political turmoil (as in Brazil for example). The rise of emerging economies has deeply changed the global economy, and it will continue to do so.

In this chapter, we identified three main reasons for this. Firstly, because of their sheer scale and size, in terms of economy and demography, emerging economies have become key actors in the global economy: as a result of their closer integration into the world economy, what takes place in emerging economies now impacts the rest of the world, including the developed nations. A number of emerging economies have also become key regional powers. Secondly, many of the emerging economies have built their growth on a strong platform of fundamentals, driven increasingly by technology and innovation development. Thirdly, emergence is not only economic; soft power is also part of the picture. The rise of emerging economies on the economic front has been accompanied in recent years by a readiness – and a willingness – to assume a new role and increased responsibility in international governance and cooperation, made visible by the launch of new multilateral institutions as well as the new role of the renminbi as an IMF reserve currency, for instance.

Emerging economies are—and will remain—quite diverse. It would be unwise to expect that the growth rates achieved by some of them for several decades could be maintained in the future. There will be ups and downs, of a bigger or smaller order, depending on each economy. But overall the rise of these economies over the past decades has definitely challenged the status quo.

A new global landscape has crystallized before our eyes. Defining its precise contours would lie far beyond the scope of this study. However, evidence is now available that suggests how different tomorrow's global landscape will be. Such evidence can be gathered in particular through the remarkable rise of emerging economies as foreign investors, and the spectacular blossoming of some of their firms as world champions, as will be shown in the next chapter.

Annex to Chapter 1

Table 1 - Emerging Markets Classification – Selected Lists

Country	IMF*	UN (UNCTAD)	BRICS	Next Eleven	FTSE	MSCI
Argentina	X	X				
Bangladesh	X			X	X	X
Bahrain	X	X				
Brazil	X	X	X		X	X
Bulgaria	X					
Chile	X	X			X	X
China	X	X	X		X	X
China Hong Kong		X				
Colombia	X	X			X	X
Czech Republic		X			X	X
Croatia	X	X				
Ecuador		X				
Egypt	X	X		X	X	X
Korea	X	X		X		X
Kuwait	X	X				
Lebanon	X					
Lithuania	X					
Malaysia	X	X			X	X
Mauritius	X					
Mexico	X	X		X	X	X
Morocco	X					
Nigeria	X	X		X		
Oman	X	X				
Pakistan	X				X	X
Peru	X	X		X	X	X
Philippines	X	X		X	X	X
Poland	X	X			X	X
Qatar	X	X				X
Romania	X	X				
Russia	X	X	X		X	X
Saudi Arabia	X	X				
Serbia	X	X				
South Africa	X	X	X		X	X
Sri Lanka	X					
Taiwan		X			X	X
Thailand	X	X			X	X
Turkey	X	X		X	X	X
Ukraine	X	X				
United Arab Emirates	X	X			X	X
Uruguay		X				
Venezuela	X	X				
Vietnam				X		

* As indicated in its World Economic Outlook, the IMF classifies as “emerging market and developing economies” (152 economies) all those that are not classified as advanced economies, without distinguishing specifically those that are emerging economies (IMF, WEO 2015). Its Global Financial Stability Report 2015 classifies as emerging economies the countries listed in this column (IMF, GFSR 2015).

Table 2: Number of Patents filed in G7 and E20 countries

E20 Patents	1994	2004	2014
China	3,883	49,360	233,228
Brazil	2,469	-	2,749
India	1,735	2,317	6,153
Russia	20,581	23,191	33,950
South Korea	11,683	49,068	129,786
Mexico	4,367	6,838	9,819
Indonesia	67	-	-
Turkey	1,102	979	1,276
Saudi Arabia	-	174	561
Nigeria	-	-	-
Poland	2,560	1,794	2,852
Argentina	2,114	840	1,360
Iran	253	1,454	3,060
Colombia	690	294	1,212
Thailand	431	716	1,286
South Africa	4,831	1,803	5,065
Malaysia	1,629	2,347	2,705
Egypt	568	325	415
Philippines	802	1,453	2,159
Chile	122	351	1,168
E20 total	59,887	143,304	438,804
% of world	14.8%	22.9%	37.3%
G 7 Patents	1994	2004	2014
Canada	11,641	13,077	23,749
France	16,872	11,836	11,889
Germany	16,915	16,661	15,030
United Kingdom	9,530	10,541	4,986
Italy	6,489	4,763	7,795
Japan	82,400	124,192	227,142
United States	101,676	164,291	300,678
G7 total	245,523	345,361	591,269
% of world	60.6%	55.2%	50.3%
World	405,355	625,100	1,176,600

Source: Authors' calculations based on data from WIPO statistics database http://ipstats.wipo.int/ipstatv2/ index.htm?tab=patent,, accessed July 2016).

Notes

[1] Van Agtmael first used this formulation when working for the International Finance Corporation (IFC) to set up a fund for investment in developing countries, reportedly to avoid the negative connotation of "Third World," as the fund was purportedly first named.
[2] O Neil, Jim. (2001). "Building Better Global Economic BRICs," *Goldman Sachs Global Economic Papers No. 66*.
[3] O'Neill, Jim, Dominic Wilson, Roopa Purushothaman and Anna Stupnytska. (2005). "How Solid Are the BRICs?," *Goldman Sachs, Global Economics Paper No. 134*.
[4] The acronym was developed by economists at the Economic Intelligence Unit (EIU).
[5] A number of other acronyms have appeared in recent years, mostly as marketing instruments of investment funds created by financial firms or entities.
[6] Iran appears only in one list in table 1 in Annex. It has been included in the E20 in view of its strong potential to play a significant role in the world economy given the geopolitical developments that have taken place since 2015. The UAE, mentioned in 4 lists in table 1 in Annex has not been included in spite of its level of GDP mostly due to the small size of its population. Taiwan, Province of China, mentioned in 3 lists has not been included either.
[7] As per UN Classification
[8] Of the ten most populated countries in the world today, seven are E20 countries (Brazil, China, India, Indonesia, Mexico, and Nigeria). Nigeria in particular is expected to see a major increase in its population which would make it the third largest country in the world by 2050. (UNDESA, *World population Prospects, 2015 Revision, Key Findings and Advance Tables*, ESA/P/WP.241)
[9] The G7, established in in 1985 to facilitate economic cooperation among the world's largest industrial nations, includes Canada, France, Germany, Great Britain, Italy, Japan, and the United States.
[10] This percentage falls to 13% if emerging economies that are OECD members (Chile, Korea, Mexico, Poland and Turkey) are excluded.
[11] Source: "UN Population Division." Available at http://www.un.org/en/development/desa/population/ (accessed March 2016). The youth is defined as the population aged 15 to 24 (Un Population Division). In addition in the E20, the population under 15 also accounts for a relatively significant part of the population (25 percent) compared with that in advanced economies such as the G7 countries (17 percent).
[12] The potentially active population, or working age population, is usually defined as those aged 15 to 64.
[13] Source : Data from United Nations, UNDESA, Population Divsion, *World Population Ageing 2015*, ST/ESA/SER.A/390, UN, New-York
[14] Source : Ibid.
[15] Kharas, Homi (2010), "The Emerging Middle Class in Developing Countries," *OECD Development Center Working Paper No 285.*
[16] In 2014 and 2015, the growth rates of the GDP (in national currency, at constant prices) were: for Brazil 0,1% and a negative 3,8% respectively; for Russia: 0,6% and a negative 3, 7%; for China: 7,3% and 6,9% and for Nigeria: 6,3% and 3,0%. (Source: IMF estimates ; World Economic Outlook Database; 2016 edition)
[17] Source: based on data from UNCTAD. Available at unctadstat.unctad.org (accessed in March 2016).
[18] UNIDO, Industrial Development Report 2016, Table 7.2. Available at http://www.unido.org/resources/publications/flagship-publications/industrial-development-report-series.html (accessed March 2016).
[19] Source: World Bank Indicators
[20] The Global Innovation Index (GII), published annually by INSEAD, Cornell University and WIPO, measures innovation across 128 economies (INSEAD, Cornell University, and WIPO, Global Innovation Index Report 2016). The GII is a composite index combining some 82 variables distributed across seven pillars (institutions; human capital and research; infrastructure; market sophistication; business sophistication; knowledge and technology output and creative outputs).

[21] Based on data from the Global Innovation Index Report 2016, ibid.
[22]Lanvin, Bruno and Anne Miroux (2016). “Les Politiques D’Innovation Dans Les Économies Émergentes et en Développement : Quels Enjeux et Quelles Perspectives à L’Échelle Mondiale?", *Geoéconomie No 80,* mai-juin-juillet 2016, Institut Choiseul, Paris, pp 127-145.
[23] Among the recent examples, in 2016, China became the country with the most super computers in the world (167 super computers among the top 500), including the fastest one which was developed using only Chinese-designed proceesors.
[24] M-Farm in Kenya or Fisher Friends in India for example.
[25] Lanvin, Bruno and Anne Miroux (2016). “Les Politiques D’Innovation Dans Les Économies Émergentes et en Développement : Quels Enjeux et Quelles Perspectives à L’échelle Mondiale?"*,* Ibid.
[26] Based on data from UNESCO statistics, UIS Stat, R&D expenditures for 2013 and 2003 (in PPP, in constant price), http://data.uis.unesco.org/ (accessed in july 2016)
[27] Based on data from UNESCO statistics, UIS Stat, R&D expenditures for 2013 and 2003 (in PPP, in constant price), http://data.uis.unesco.org/ (accessed in july 2016)
[28] It is true, though, that the outcome in terms of quality is not always commensurate with the policy efforts made, as reflected for instance in the PISA scores of some emerging markets or the global university rankings. While for instance the PISA scores of countries such as China, Korea, and Poland are superior to those of the OECD average, those of countries such
as Brazil, Indonesia, Malaysia, Mexico or Thailand are clearly below, sometimes in spite of the high education expenditures ratio (as in the case of Brazil). That being said, it is also worth noting that countries such as France, the UK or the United States are either slightly below or barely superior to the OECD average (based on PISA 2012 results, OCDE, http://www.oecd.org/pisa/pisaproducts/pisa2012database-downloadabledata.htm)
[29] Gross enrolment ratios were used for Tables 4 and 5. Net secondary enrolment ratios are not available for recent years for many countries. For tertiary education, net enrollment ratios are not available.
[30] It has been estimated for instance that, for a 10% increase in broadband penetration, there is a 1,3% increase in GDP (Qiang and Rossoto, 2009).
[31] "Gross" enrollment includes students of all ages. In other words, it includes students whose age exceeds the official age group (e.g. repeaters). Thus, the total enrollment can exceed the population of the age group that officially corresponds to the level of education - amounting to ratios greater than 100 percent."
[32] Source: “Annex A.” *ITU Broadband Commission Report 2015.* Available at http://www.broadbandcommission.org/documents/r eports/bb-annualreport2015.pdf (accessed August 2016).
[33] The agreement on the New Development Bank (NDB) was signed at the 6th BRICs Summit in Brazil in 2014. Its headquarters opened in Shanghai in March 2016.
[34] The initiative on the Asian Infrasctrue Bank was launched in 2014. The Agreement was signed in 2015 by the initial members, and joined by others later. The Bank opened in January 2016.
[35] The One Belt, One Road initiative, launched in 2013, aims to foster integration and cooperation (by building infrastructure, developing cultural exchange, and increasing trade) among countries in Asia, Middle east and North Africa along two axes: the Silk Road Economic Belt (essentially the original silk road) and the 21st Century Maritime Silk Road.
On the intiative, see for instance: D. Dollar, “China's rise as a regional and global power: The AIIB and the 'one belt, one road'” Available at http://www.brookings.edu/research/papers/2015/07/china-regional-global-power-dollar and Scott Kennedy and David Parker, “Building China’s ‘One belt, One Road’,” Center for Strategic and International Studies (CSIS). April 2015. Available at https://www.csis.org/analysis/building-china’s-“one-belt-one-road”
[36] The Remimbi will join the US$, the euro, the UK pound and the Japanese Yen. The euro was the latest currency to join the basket in 1999.
[37] The move "is an important milestone in the integration of the Chinese economy into the global financial system," IMF Managing Director Christine Lagarde said. IMF Press Release No. 15/540. November 30, 2015.
[38] Some observers however have pointed to the new uncertainty this could introduce in China’s financial and

economic system. Keith Bradsher (November, 30 2015). “China’s Renminbi Is Approved by I.M.F. as a Main World Currency.” *New York Times*,Available at http://www.nytimes.com/2015/12/01/business/international/china-renminbi-reserve-currency.html?_r=0

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