Benchmarking Innovation and Entrepreneurship in Selected OECD and BRICS Countries

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I The economic and social importance of innovation and entrepreneurship

Innovation is a key driver of economic growth. This is especially true for advanced economies, where stagnating or declining populations narrow the scope for labor input to influence long-term economic growth. However, innovation is also relevant for emerging countries such as the BRICS (Brazil, Russia, India, China and South Africa)[2], as investment in physical capital (e.g. machinery and equipment) faces diminishing returns and natural resources are "naturally" limited. If emerging economies are to improve labor productivity and accelerate economic convergence with the OECD area, they also need to invest more intensively in R&D and other forms of innovation. It is, for example, not surprising, that among the BRICS China is the country which has both invested the most in R&D and which has brought faster and further than any other BRICS member the process of economic convergence with the richest economies.

Innovation is fundamental not only to drive productivity growth but also to address global and social challenges, such as climate change and ageing populations. Market failures limit investments in the innovations needed to address these challenges. Governments can correct this by using the levers of tax policy – for example, through pricing carbon emissions and removing environmentally harmful subsidies – and by taking the lead and carrying out research in areas that are too uncertain and risky for firms to invest in.

The scale and complexity of global challenges means that they need to be addressed at the international level. This is possible today because, thanks to globalization, the innovation process has become increasingly collaborative across countries, economic sectors, and disciplinary fields. Clean energy technologies are a case in point (see Figure "The innovation-science link in clean technologies, 2000-2009), as patents in this technology field draw on scientific research from a range of disciplines, including material science, chemistry and physics.

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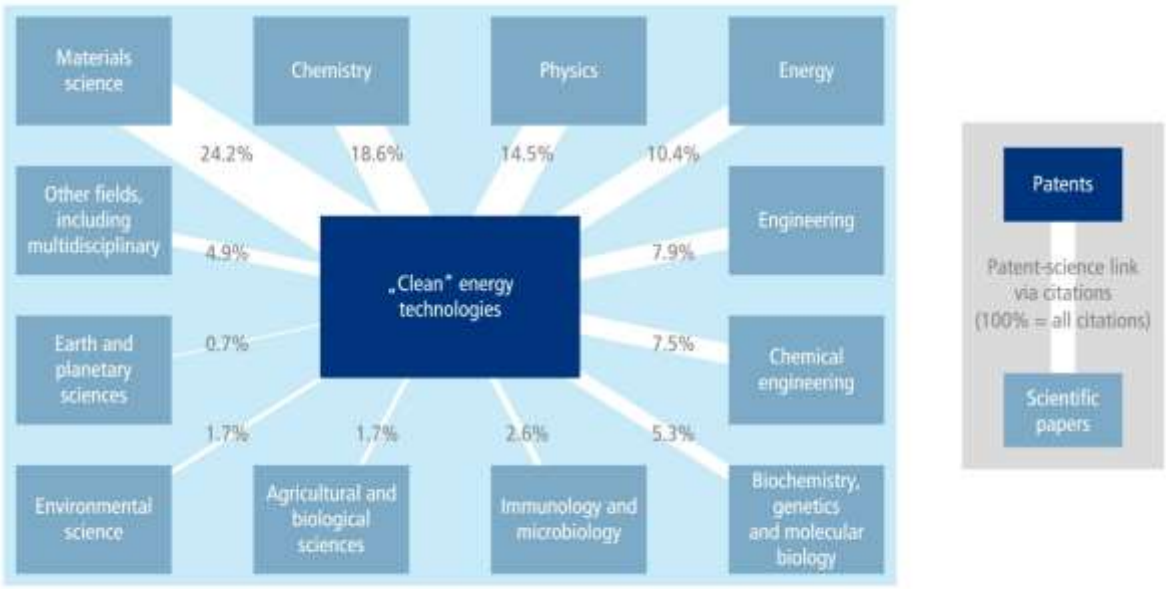
[2] Further information on these countries is available in the country pages of the OECD-World Bank Innovation Policy Platform: http://www.innovationpolicyplatform.org/

The innovation-science link in clean energy technologies, 2000-2009

Share of scientific fields cited in total non-patent literature cited in patents for "clean" energy technologies



Source: OECD. OECD Science, Technology and Industry Scoreboard. OECD Publishing. Paris. 2011.

This makes the business innovation process different from the past, when it was the exclusive domain of corporate R&D labs, and stresses the importance of knowledge networks, especially for innovation among new and small firms; what has sometimes been termed "innovative entrepreneurship". Major sources of innovative entrepreneurship have, therefore, become formal and informal partnerships among similar-sized businesses; buyer-supplier relationships between large firms and SMEs; universities and research organizations through, technology licensing agreements, collaborative research and consultancies; governments, through intermediary organizations such as technology centers and incubators; and even consumers, through the growing role of the Internet, which allows for feedback on products and services. These changes have led analysts to talk of innovation in terms of an open process.

Collaborative and multidisciplinary innovation has grown in parallel with the rise of non-technological innovation, including innovations in the fields of marketing and organizational processes. Non-technological innovation is especially important in the services sector, and this has in turn resulted in an enlargement of the nature and scope of innovation policies. Investments in intangible assets[3] – which are closely related to non-technological innovation – have spurred growth in many OECD economies, since they have increasing returns to scale in production and generate knowledge spillovers that benefit the economy as a whole (OECD 2013a).[4]

[3] Intangible assets include R&D, but also other forms of innovative property (e.g. copyrights and designs), computerized information (e.g. software and databases), and economic competences (e.g. worker training, branding, market research and management consulting).

[4] Increasing returns mean that the costs incurred in producing knowledge is not re-incurred when re-using it. This is what makes investments in intangible assets different from investments in physical capital.

Future radical innovations: the "greening" role of nanotechnologies

What is it

One could describe green nanotechnology as a foundation for products and processes that are safe and have a low net environmental impact, being energy efficient, reducing waste, lessening greenhouse gas emissions and using renewable materials. Green nanotechnology can be seen as supporting the development of sustainable solutions to address global issues such as energy shortages and scarcity of clean water and being present in environmentally-sustainable manufacturing processes.

Why it is important

Nanotechnology is an emerging technology and has a variety of possible applications, a large proportion of which will require further funding for pre-competitive research and development. Green nanotechnology is linked to other concepts such as green chemistry and sustainable and green engineering and manufacturing. Green nanotechnology can have multiple roles and impacts across the whole value chain of a product and can be of an enabling nature, being used as a tool to further support technology or product development. For example, nanotechnology can play bring key functionality to a product (e.g. nanotechnology-enabled batteries) or enable more sustainable manufacturing processes without the final product containing any nano-materials.

Trends

The following areas can be seen as important applications of green nanotechnology:

- *Solar cells* become more efficient as they get smaller and solar energy is a renewable resource. Nanotechnology is already used to provide improved performance coatings for photovoltaic (PV) and solar thermal panels. Hydrophobic and self-cleaning properties can combine to create more efficient solar panels, especially during inclement weather. PV covered with nanotechnology coatings could therefore stay cleaner for longer to ensure maximum energy efficiency is maintained.
- Nanotechnology offers the potential of novel nano-materials for the *treatment of surface water*, groundwater and wastewater contaminated by toxic metal ions, organic and inorganic solutes and microorganisms. Due to their unique activity toward contaminants, many nano-materials are under active research and development for use in water treatment.

Policy Challenges

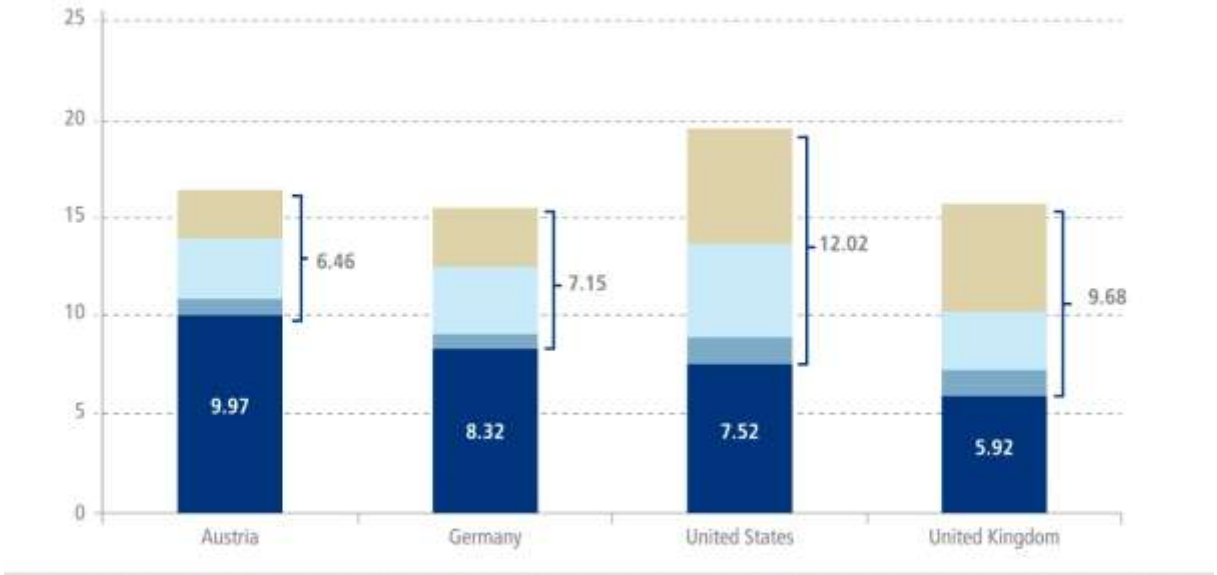
The key policy challenges in developing nanotechnology for green innovation are similar to those for any emerging technology: finding appropriate ways to ease the connection between research and development and commercialisation. Key areas for policy intervention include: a) continued investment in research and development; b) diminishing and sharing the costs of the development and commercialisation of green nanotechnology, including examination of external risks such as environmental health and safety, and ethical and social issues; c) support to prototyping and pilot manufacturing, noting that for impact on major environmental and societal challenges, nanotechnology will have to be manufactured and used in high volumes; d) promoting better links between public and private research in the field; e) design of demand-side policies supporting the development and commercialisation of nanotechnology for global challenges. This would include area where there is considerable uncertainty about market perspectives and customer/user demand.

Source: OECD (2013e). Nanotechnology for Green Innovation. OECD Science, Technology and Industry Policy Papers. No. 5. OECD Publishing. Paris 2013.

Evidence from the European Union and the United States shows that business investment in intangible assets accounts for between 20% and 27% of average labor productivity growth. Interestingly, over the period 1995-2010, business spending in non-R&D forms of intangible assets increased more than investments in R&D in the United States, from 8.5% to 11.2% of value added compared with from 2.3% to 2.4% of value added (OECD 2013a). In some OECD countries, such as the United States and the United Kingdom, where innovation in the services sector is especially relevant, investments in intangible assets have even overtaken in importance investments in physical capital. In other countries, such as Germany and Austria, where manufacturing still contributes to a considerable portion of employment, investments in intangible assets account for a smaller, but growing, share of GDP than investments in physical capital.

Investments in fixed and intangible assets, 2006

Percentage of GDP



These estimates are based on national studies. They do not yet reflect standardized methods and definitions.

Source: OECD (2010a), Measuring Innovation: A New Perspective. OECD Publishing, Paris. 2010.

The fact that innovation has become increasingly collaborative and non-technological has increased the scope of new and small firms to engage in innovation activities by reducing their structural disadvantage related to the lack of economies of scale. This is especially true in knowledge-intensive sectors, where the contribution of new and small firms to radical innovations has often been recognized (Baumol 2002). Increasing incomes worldwide and the consequent rise of market niches have further enhanced the scope of innovative entrepreneurship and accelerated the shift from a “managed economy” to an “entrepreneurial economy” where the role of new and small firms in innovation and economic development has grown in importance.

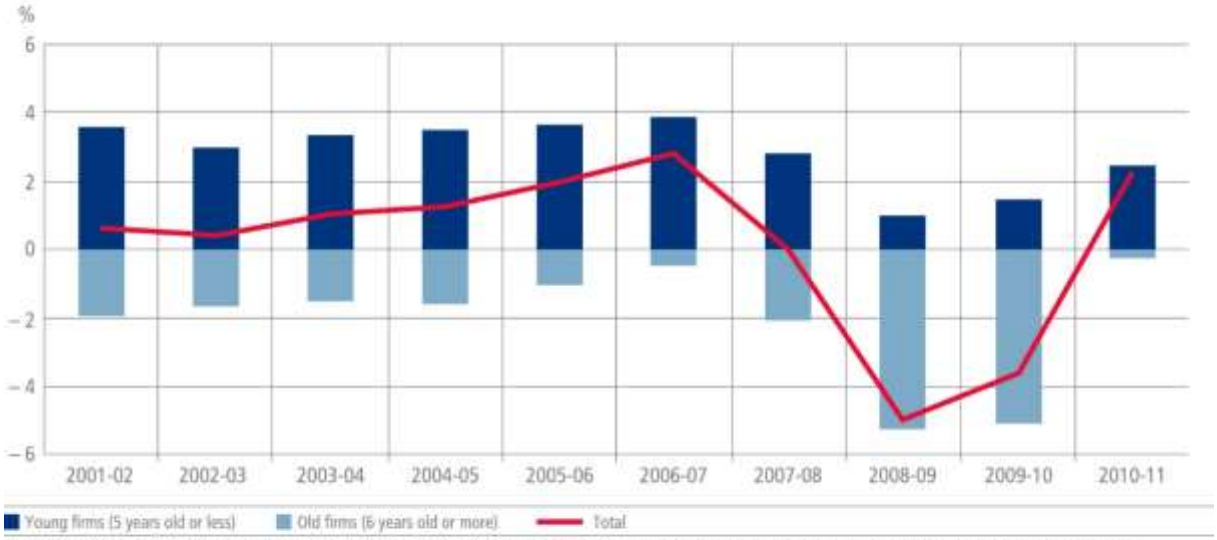
The way new business start-ups contribute to growth is precisely through competition and innovation. New enterprises place competitive pressure on incumbent companies, which are obliged to innovate if they are to survive. On the whole, these dynamics improve the allocation of resources in the economy by forcing less efficient firms out of the market. Entrepreneurship also contributes to innovation and growth through another channel, which is knowledge spillovers generated but not exploited by incumbent companies. Because incumbent companies prioritize the commercialization of existing products and technologies, they leave unused knowledge that is harnessed by entrepreneurs to enter new or established markets (Acs et al. 2009).

Theory is supported by empirical evidence, which points to a strong relationship between start-up rates, on the one hand, and economic growth and job creation, on the other hand; new and small firms take up labor released by elsewhere in the economy and increase national competitiveness (Acs et al. 2005; Stangler and Litan 2009). In particular, high-growth firms – which are firms able to grow rapidly over a short period of time and are the quintessential example of entrepreneurial SMEs – account for most job creation in the economy, with between 4% and 6% of high-growth firms generating half to three-quarters of all new jobs (Henrekson and Johansson 2010).

The key role of entrepreneurship for job creation has been confirmed by a recent analysis of the OECD covering 15 countries and showing that young businesses aged less than five years are the main source of new jobs, including during the financial crisis in 2008 when the majority of jobs destroyed reflected the downsizing of old businesses, while net job growth in young firms remained positive (see Figure “Net job growth, younger versus older firms”).

Net job growth, younger versus older firms, 2001-2011

Average over 15 countries



Preliminary results from the OECD DYNEMP project. Average over the following countries: Austria, Belgium, Brazil, Finland, France, Hungary, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Spain, Sweden and the United States. The sectors of the economy considered are: manufacturing, construction and services (except for financial services). Owing to methodological differences, figures may deviate from officially published national statistics. Net job growth is defined as the ratio of the difference in employment for each group of firms (young, old and total) in two subsequent years to the average employment in the two years considered.

Source: OECD (2013b). OECD Science, Technology and Industry Scoreboard. OECD Publishing. Paris. 2013.

In addition to an economic dimension, entrepreneurship also has a relevant social dimension. Self-employment provides an opportunity for those on the margins of the labor market to continue to be active and avoid the atrophy of professional skills, which could lead to long-term unemployment. Also, self-employment is a labor market alternative to wage employment for those who prefer the flexibility of the former over the relative rigidity of the latter, for example in order to better combine work and family life. Nonetheless, it should be recognized that self-employment is not suitable to everyone in the labor market. The objective of policies promoting socially inclusive entrepreneurship should therefore be to open up opportunities for business creation to more people, including those disadvantaged in the labor market (e.g. migrants and unemployed) or underrepresented in the business owner population (e.g. youth and women), and provide them with the skills and resources to succeed, rather than to turn indiscriminately unemployed or inactive people into entrepreneurs (OECD 2013c).

II A benchmarking analysis of selected OECD and BRICS economies

1. Main messages

This section delves into innovation and entrepreneurship performance in selected OECD and BRICS countries. The focus is on Austria, Germany, the United Kingdom and the United States among the OECD member countries, and on the full set of BRICS countries (Brazil, Russia, India, China and South Africa). Whenever possible, statistical information is presented for the full set of nine countries, although this is not always possible due to lack of data harmonization in some cases.

The main message of this section is that over the last decade the BRICS economies, China in particular, have accomplished a remarkable process of economic convergence with OECD economies, including those taken into consideration by this paper. This process has accelerated in the aftermath of the 2008 global economic crisis, which hit the United States and the European Union more severely than the BRICS, while it has more recently subdued owing to both economic recovery in the Euro area and some signs of fragility in emerging economies. However, despite progress, the gaps in per-capita GDP between the BRICS and the United States remain considerable, three to four times as large as those with the selected OECD economies (Austria, Germany and the United Kingdom). The catch-up process is, thus, far from being completed and is likely to benefit from future bigger investments in innovation.

OECD statistics show, in fact, that with the significant exception of China, investments in R&D among other BRICS have not increased considerably in the last 10 to 12 years. For example, while it is true that BRICS countries have become top producers and exporters of manufactured goods, the rise of China overshadows the others and in value-added terms even the lead of China is less clear;[5] the Unites States is, in fact, still the top manufacturing producer ahead of China in value-added terms.

Data by firm size underscores that the SME sector performs better in the selected OECD countries than in the BRICS; this is especially true in Austria. This is also the consequence of product market regulations less conducive to entrepreneurship and SME development in the BRICS than in OECD economies. Nonetheless, a disaggregated analysis shows that there is room for reform in OECD countries as well. For example, the system of licenses and permits is still quite complex in the United Kingdom and Germany, while administrative burdens to start-ups could be further lowered in Austria.

The remainder of this section presents a more detailed analysis of our benchmarking exercise of innovation and entrepreneurship performance across the nine selected countries.[6]

2. Convergence in the BRICS area is in the making, but income gaps remain significant

BRICS countries have continued their catch-up process in the first decade of the new millennium. In the period from 2001 to 2012, any of the benchmarked OECD economies grew at an annual rate higher than 1.5% (Germany: 1.3%; Austria: 1.1%; United Kingdom and United States: 0.9%), whereas China expanded at a staggering yearly rate of 9.5; India at 5.7% and Russia at 4.9%. Nonetheless, the growth rates of Brazil and South Africa have been much less spectacular,

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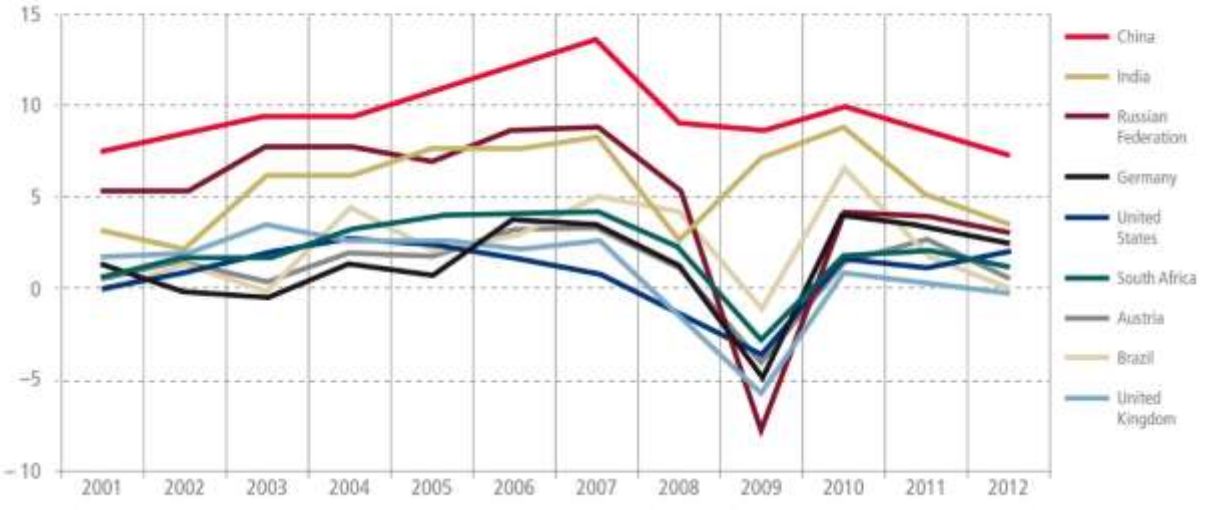
5 Value added is the outcome of both technological and non-technological innovation.

6 Several of these indicators can be explored using the Innovation Policy Platform's data visualization tool (http://www.innovationpolicyplatform.org), on its Statistics section.

respectively 2.2% and 2% per year, as they have been emaciated by longstanding problems such as lack of infrastructure and high energy costs in the former and high unemployment rates and economic informality in the latter.

Annual GDP per capita growth rates, 2001-2012

Percentage values



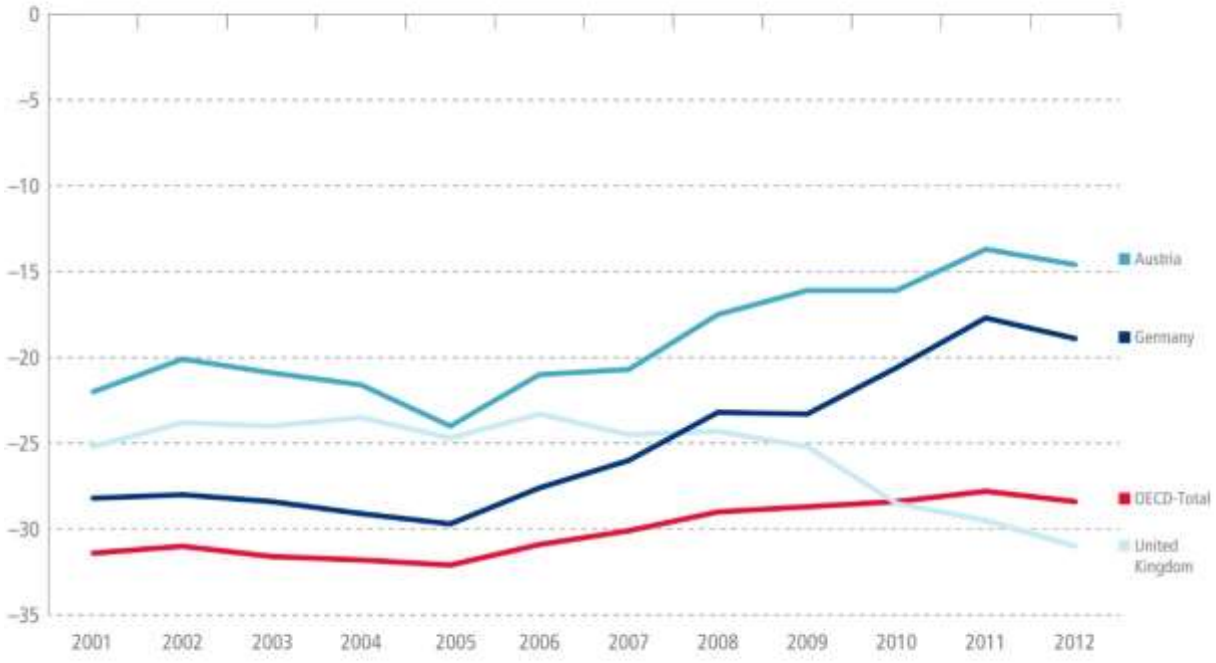
Source: World Bank World Development Indicators.

Economic convergence gained momentum in the wake of the 2008 financial and economic crisis, which struck advanced economies more than emerging economies. Indeed, the BRICS saw their annual growth rates reduced, but more marginally and more temporarily than the selected OECD economies. More recently, however, due to economic recovery in the United States and, more partially, in the Euro area and the emergence of some signs of fragility in the major BRICS economies (e.g. increasing production costs), the catch-up process has slowed down. For example, in the period from 2007 to 2009, on average, GDP per capita had risen by 5.3% in the BRICS countries and fallen by 2.4% in the OECD countries (i.e. a gap of 7.7 percentage points). In the following period from 2009 to 2012, average annual growth rates were respectively 6.3% and 1.5% in the BRICS and OECD areas (i.e. a gap of 4.8 percentage points).

Although BRICS economies have progressed significantly over the last 12 years, GDP per capita gaps with the leading American economy remain wide. Income gaps with the US economy in the BRICS area range between -54% (Russia) and -92% (India), while in the selected OECD economies between -15% (Austria) and -31% (the United Kingdom), with Germany being at -18%. Figure “GDP per capita gap of selected OECD economies with the United States”, in particular, shows that Austria and Germany have been more resilient to the economic crisis than the United States, as GDP per capita gap has narrowed since 2007, while the opposite is true for the United Kingdom.

GDP per capita gap of selected OECD economies with the United States, 2001-2012

Percentage values

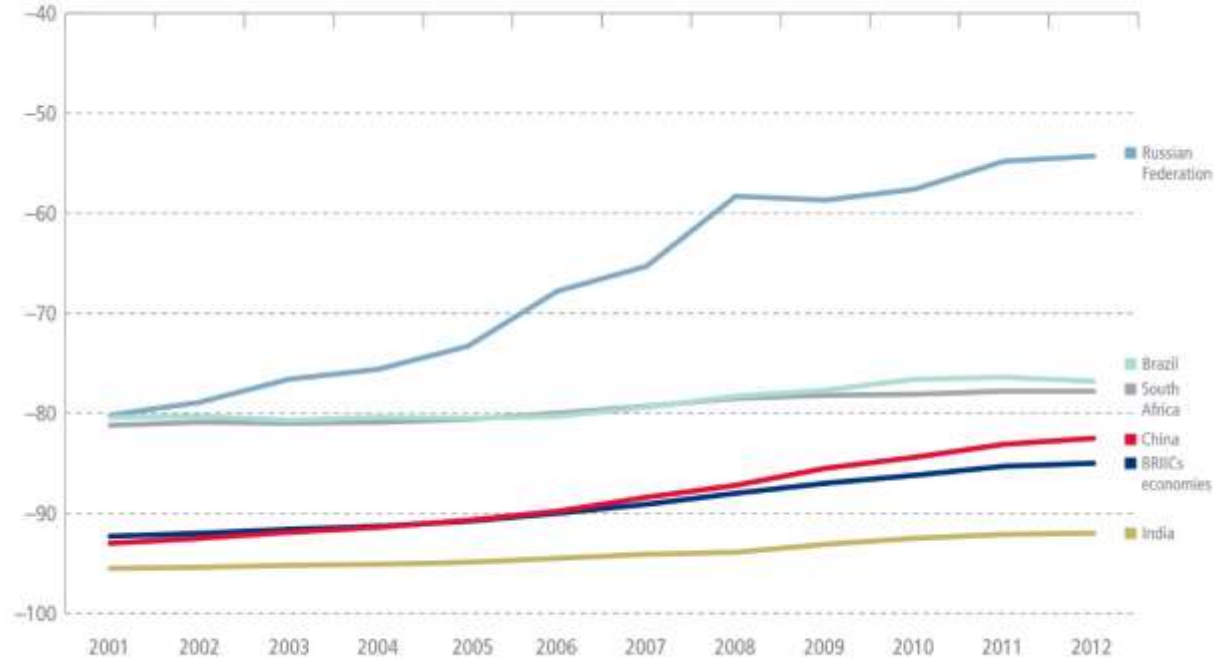


Calculations are based on GDP at constant prices, converted to USD using 2005 purchasing power parities.

Source: OECD (2013b). OECD Science, Technology and Industry Scoreboard. OECD Publishing. Paris 2013.

GDP per capita gap of BRICS economies with the United States, 2001-2012

Percentage values



Calculations are based on GDP at constant prices, converted to USD using 2005 purchasing power parities.
BRIICS value also includes Indonesia.

Source: OECD (2013b). OECD Science, Technology and Industry Scoreboard. OECD Publishing. Paris. 2013.

With respect to the BRICS (Figure “GDP per Capita of BRICS economies with the United States”), large income gaps are mainly the result of labor productivity shortfalls compared with the United States. For example, China’s GDP per capita soared during the years of the crisis, bridging the gap by over 6 percentage points (i.e. to 82.5% in 2012). As China’s labor force participation rates have remained above the OECD average, income differences are primarily the result of lower capital per worker and lower multifactor productivity. In Brazil, income gaps are narrowing more slowly (i.e. to 76.8% in 2012) and are due to comparatively weak labor productivity performance (OECD 2013b).

3. BRICS economies need to invest more in R&D to continue on the convergence path

Labor productivity shortfalls stress the need for future larger investments in innovation if major emerging economies are to further bridge the income gap with advanced economies. As the returns from increased labor utilization tend to decline in the path to convergence and investments in physical capital have diminish returns to utilization, investments in both technological and non-technological innovation will become increasingly important for the BRICS to keep sustained rates of growth. This is illustrated by the case of another fast-growing economy from the past, South Korea, which rapidly caught up with OECD economies in the 1980s and 1990s thanks to technology imitation and adaptation, and which over the 1990s has raised R&D by 9.6%, becoming one of the few OECD members where the R&D to GDP ratio is above 3%.

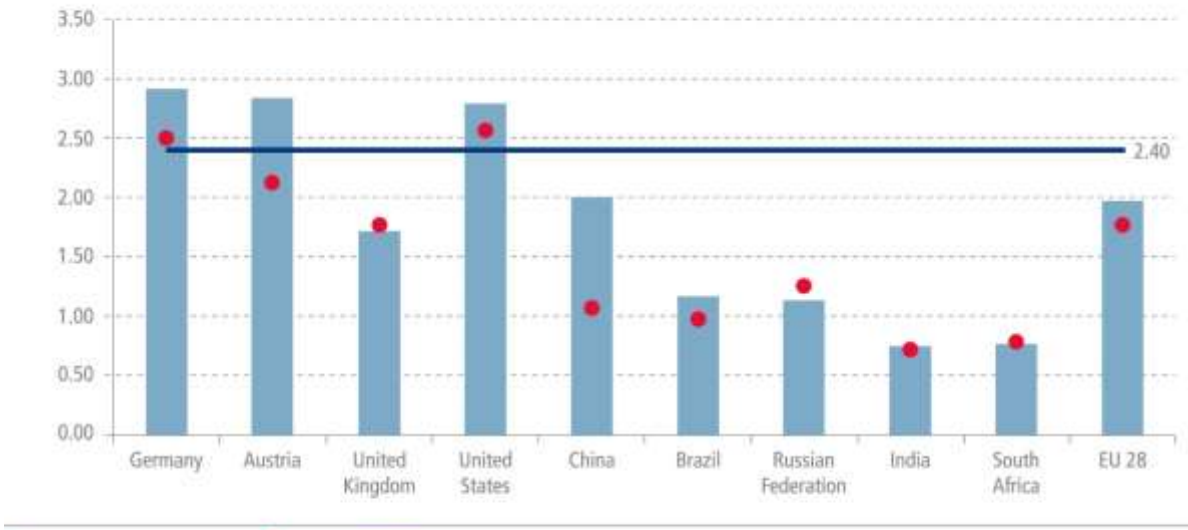
OECD harmonized innovation statistics show that, with the exception of China, the BRICS are still far from investing in innovation as much as the benchmarked OECD countries do. Over the period 2002-2012, China stepped up its public expenditure on R&D from $42.5 billion to $212 billion, at purchasing power parity, which corresponds to a fivefold increase. Since 2000, China’s average annual growth rate in R&D spending has been 17.6%, making it the world’s second largest R&D performer behind the United States but ahead of Japan since 2009 (OECD 2014). China’s current levels of R&D spending are already as much as three-quarters of those of the EU-28 and half of those of the United States. While it is true that much of this spending goes into military-related research, such research also has trickle-down effects into civil applications, as the history of the United States in the last century has widely shown.

However, growth in R&D spending in the remaining BRICS has been much less stellar. Over the observed period, for example, Russia inched up R&D public spending from $17.3 billion to $24 billion, which resulted into a drop by 0.13% relative to GDP. This suggests that Russia has not exploited increased fiscal revenues from resource-driven growth to proportionally commit more resources to R&D and that this might become a barrier to the future diversification of the economy. India and South Africa’s public investments in R&D relative to GDP have also remained stable in the last 10 years, which is possibly the outcome of low fiscal revenues due to the large swathes of informality in both countries, while those of Brazil have marginally increased (+0.2%).

In the benchmarked OECD economies, on the other hand, public R&D spending has been on the rise in the last ten years, with the exception of the United Kingdom where it has stalled. Germany has beefed up its public R&D budget from $63 billion in 2002 to $83 billion in 2012, corresponding to an increase of +0.4% relative to GDP. Austria’s growth in R&D government spending has been even stronger, from $5.5 billion to $8.7 billion, that is +0.7% relative to GDP.

Gross domestic expenditure on R&D, 2002 and 2012

Percentage of GDP



2012 or latest available year ● 2002 — OECD average 2012

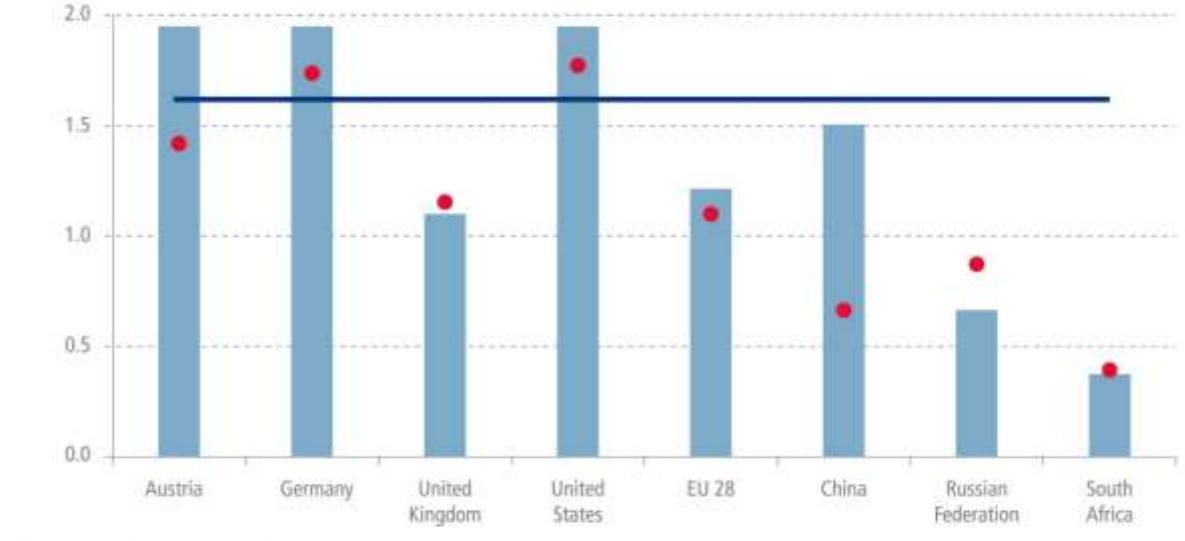
Latest available year for Brazil and South Africa is 2010, for India 2007.
All figures are based on the OECD database, except for Brazil's and India's which are based on World Bank WDI and include both public and private R&D. OECD and World Bank values are not therefore strictly comparable. In particular, lower business R&D than government R&D, which is the reality of most countries, will push down the aggregate value for Brazil and South Africa.

Source: OECD. OECD Factbook: Economic, Environmental and Social Statistics. OECD Publishing Paris and World Bank World Development Indicators. 2014.

Figures on R&D business expenditure largely confirm the trends observed above, which shows the presence of a strong correlation between public and private spending on R&D. China's business enterprise R&D (BERD) has soared over the period 2002-2012, from 0.5% to 1.5% of GDP, which is essentially in line with the OECD average. In particular, over the period 2007-2012, the Chinese BERD has more than doubled, although it should be noted that a large share of the enterprises that carry out large volumes of R&D are state-owned in China. The solid performances of Germany and Austria and the weak record of the United Kingdom and Russia are also reflected in business R&D statistics.

Business enterprise R&D, 2002 and 2012

Percentage of GDP



2012 ● 2002 — OECD average 2012

Latest available year for South Africa is 2010.

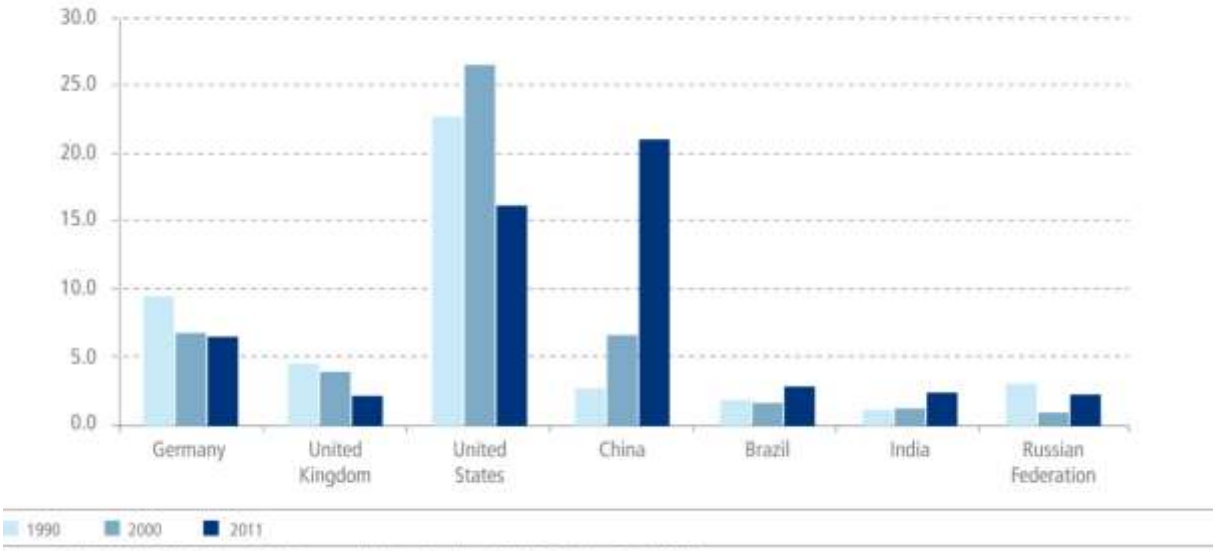
Source: OECD Main Science and Technology Indicators (MSTI) Database.

4. Innovation in manufacturing continues to mainly happen in the OECD area

The rise of the BRICS as manufacturing powerhouses is unquestioned. In 1990, the G7 countries accounted for two-thirds of world manufacturing value added, but now account for about 40%. In 2010, China passed the United States to become the world's leading manufacturing producer, while Brazil and India have moved ahead of the United Kingdom.

Selected top manufacturers over the last twenty years

Percentage share of total world manufacturing value added

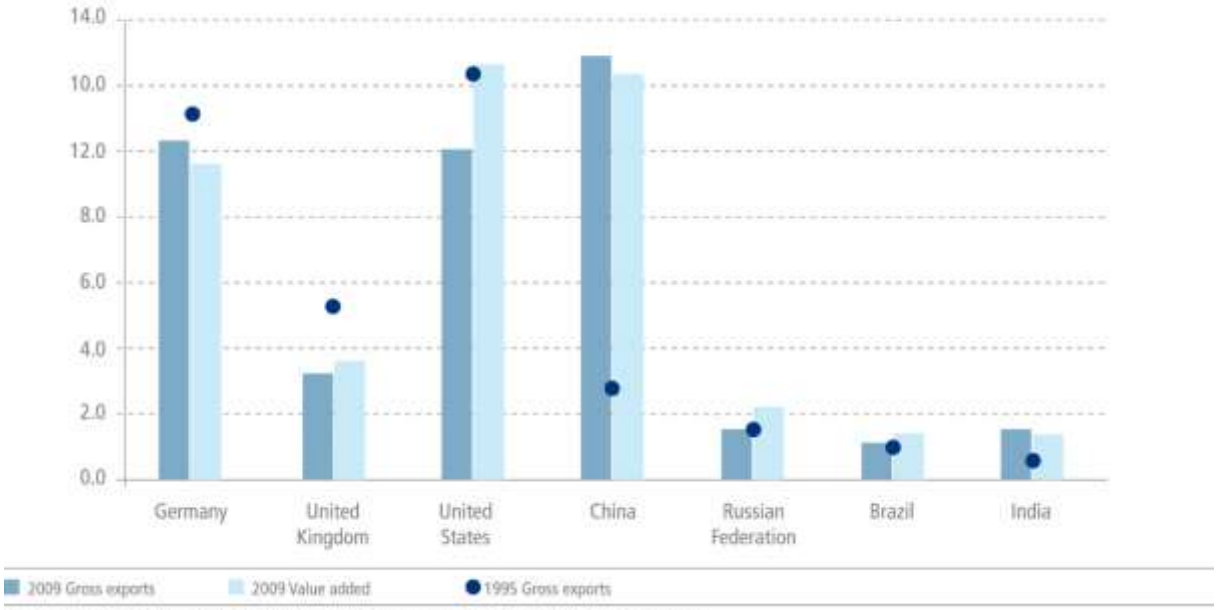


Source: OECD (2013b), OECD Science, Technology and Industry Scoreboard, OECD Publishing, Paris. 2013.

China has also become the top exporter of manufactured goods. However, in value added terms, its lead over the United States is less clear. In fact, in 2009, the share of manufacturing exports in value-added terms of the United States still exceeded that of China by a small margin (Figure "Selected top manufacturers over the last twenty years"). India has also marginally increased its share of manufacturing exports in gross terms, while Brazil and Russia have kept their levels stable since the mid-1995s. Conversely, and consistently with production statistics, the benchmarked OECD economies have seen their share of world trade exports diminished, although higher shares of manufacturing exports in value added terms than in gross terms for the United States and the United Kingdom signal that both countries export high-quality parts and components that are subsequently embodied in the exports of other countries.

Top exporters of manufactured goods in gross (1995 and 2009) and value-added (2009) terms

Percentage share of total world manufactured goods



Source: OECD (2013b), OECD Science, Technology and Industry Scoreboard, OECD Publishing, Paris, 2013.

The interconnectedness of BRICS and OECD economies is confirmed by "value-added export ratios", which are given by the total domestic value-added share of gross exports. In broad terms, these figures tell us how much countries contribute to the total value added of their exports and how much they depend on foreign value-added content. The indicator is, therefore, a proxy of both economic interdependence and domestic innovation. Figure "Top exporters of manufactured goods in gross (1995 and 2009) and value added (2009) terms" shows that value-added export ratios have dropped since the mid-1990s for almost all the benchmarked countries, with Russia being the only exception.[7] This means that national exports increasingly rely on foreign value-added content, that is, on parts and components previously imported from abroad. Interestingly, this is especially true for China and India, whose domestic value-added share of gross exports has fallen respectively by 21% and 12% in the period 1995-2009. This implies that China and India are both highly linked to the rest of the world – the most interlinked among those benchmarked in this paper – and that they are involved in the export of technology-intensive products more than they did fifteen years ago. However, between 22% (India) and 32.5% (China) of the value-added of their exports is of foreign origin, which makes them dependant on the import of technology from abroad. Conversely, the same values are 11.3% for the European Union and 13.6% for the United States, a sign that both areas generate internally most of the value added inherent to their exports.

5. The SME sector is significantly more productive in the selected OECD economies, especially Austria [8]

Small enterprises (i.e. between 1 and 49 employees) make up everywhere the overwhelming majority of the business population (Figure "Contributions of the small business sector to number of firms, employment and value added"). The benchmarked countries are no exception, although there is still a considerable difference between the 98% found in Austria and the 93.7% in Russia. Differences, however, are more relevant when the contribution of the small business sector to employment and value added is taken into consideration. In Austria, for example, small enterprises

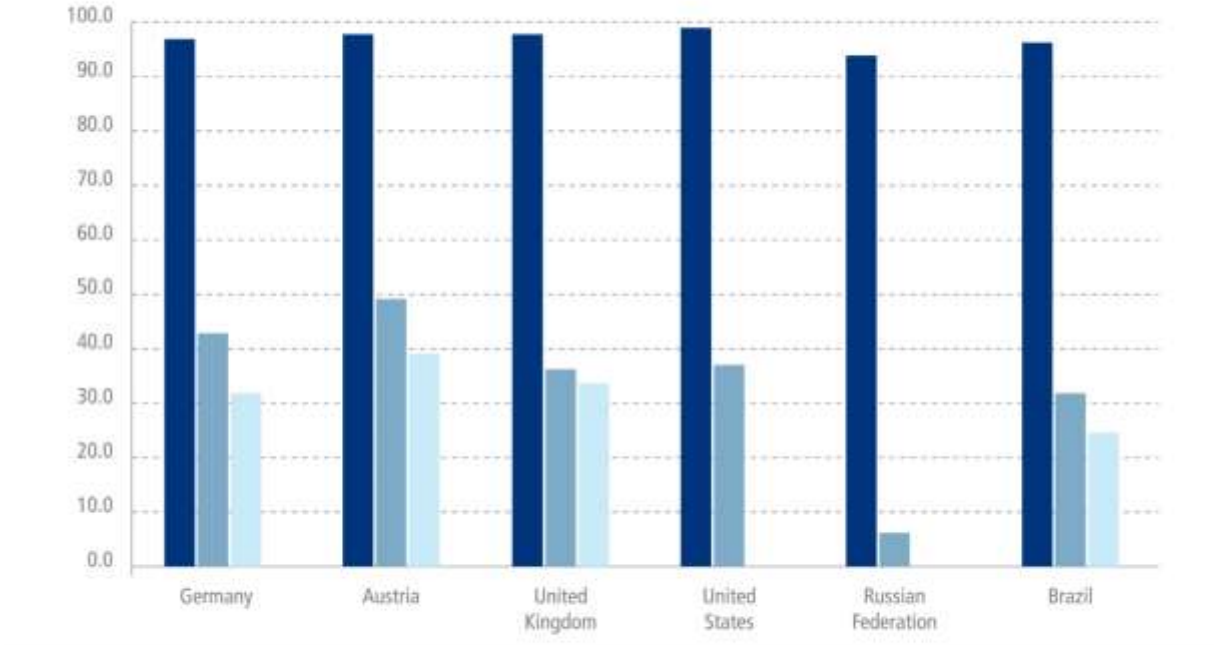
7 Russia's figures are possibly affected by a big slice of its exports stemming from natural resources.

8 Data by firm size on China, India and South Africa are not available.

contribute to 49.3% of total employment and 39.2% of the total value added generated by the business sector, whereas Brazil's values are considerably lower, i.e. 31.7% and 24.9%. This means that Brazilian small firms are less able to generate employment and value added, thereby contributing less than their peers elsewhere to national productivity.[9] It is also surprising the very small contribution of Russian small firms to employment, which might be the result of regulatory barriers to business growth for sole proprietor firms in this country.

In every country, the gap between the contribution of the small business sector to employment and value added is generally large, which is the result of the average low productivity of this segment of the business population. However, the United Kingdom is an exception: a gap of only 2.2 percentage points between the contributions of British small firms to employment and value added points to a performing small enterprise sector in this country.

Contributions of the small business sector to number of firms, employment and value added, 2010



The small business sector is defined as firms with between 1 and 49 employees. Size classes in the United States are different; small enterprises, in this case, are defined as having up to 99 employees.

Source: OECD (2013d). Entrepreneurship at a Glance. OECD Publishing. Paris. 2013.

The characteristics of medium-sized firms (50 to 249 employees) are quite different from those of the small ones. Medium-sized firms have generally better access to external finance, invest more in training and innovation and are more present in international markets. Unsurprisingly, they are considered in many countries key drivers of national growth.

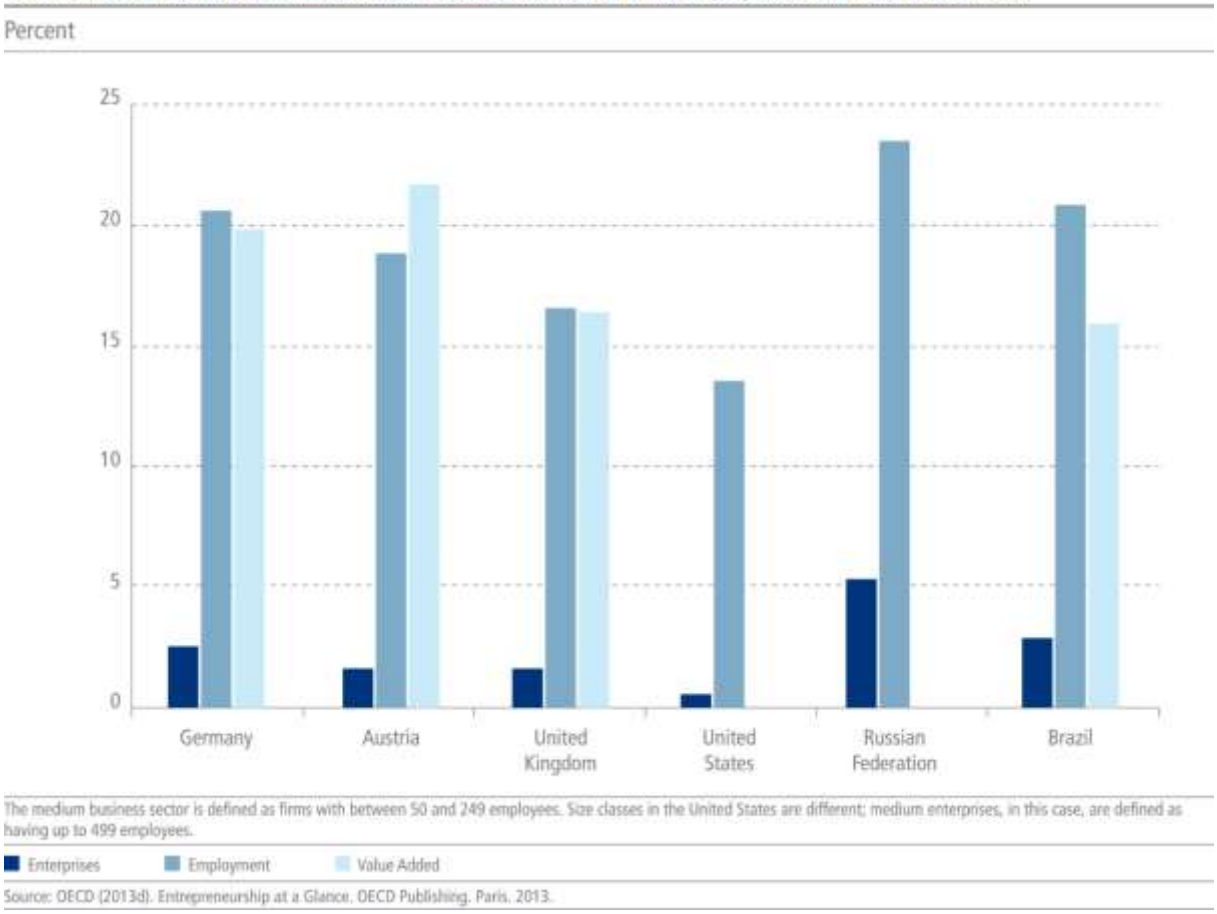
Germany, which has a strong reputation for its *Mittelstand* businesses, turns out to have the strongest medium-sized sector in terms of both size (i.e. share of the total number of firms) and employment (i.e. share of total employment). In terms of value added, however, Austria does better

[9] It should be noted that cross-country comparisons within the same business size bands are also affected by the within-country performances of the other business size bands.

in spite of a smaller medium-sized sector. Together with a very productive small business sector, this makes the Austrian SME sector the strongest among those benchmarked.[10]

The gap between employment and value added is much lower in medium-sized firms than in small firms across all countries, a sign of greater average productivity in the medium-sized business sector compared with the small business sector. The largest gap is found in Brazil (5 percentage points), which therefore emerges as the country with the least productive medium-sized firms. Reasons might be multiple – for example, energy costs are reportedly high in Brazil – and include still high barriers to entrepreneurship in the Latin American country (see section below).

Contributions of the medium-sized business sector to number of firms, employment and value added, 2010



6. The economic crisis has dampened entrepreneurship dynamics everywhere

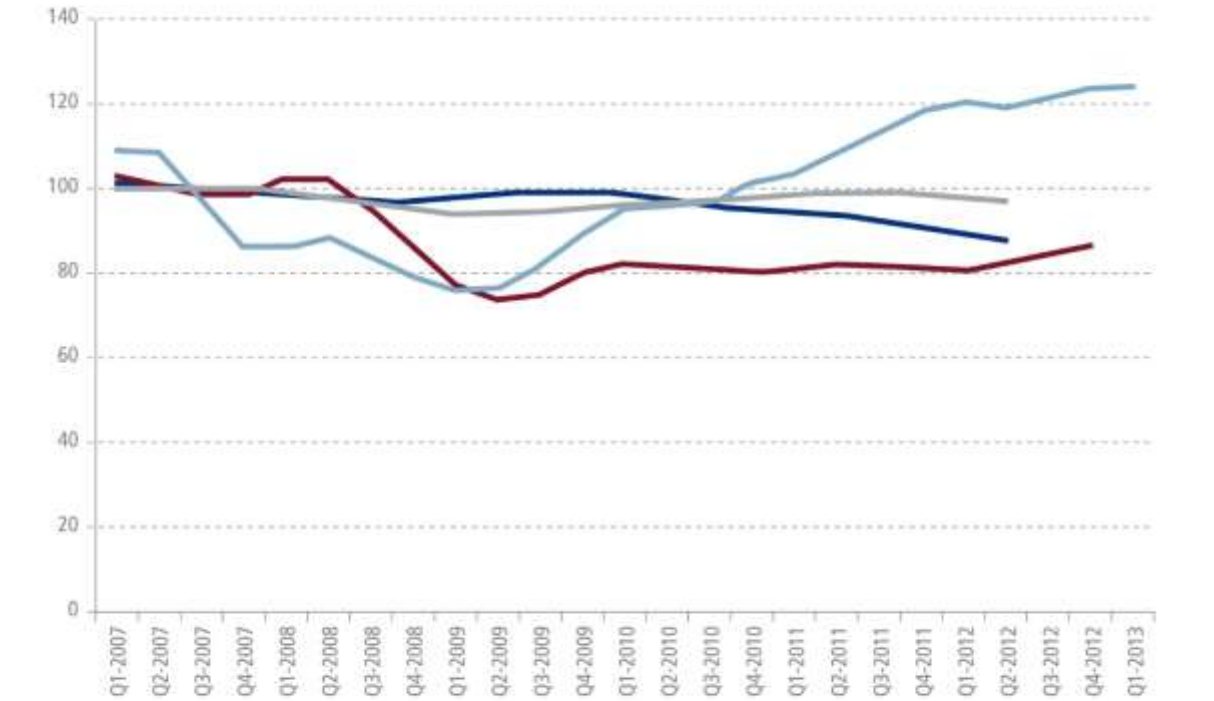
It has been observed that “creative destruction” – the process whereby economic growth and change force less productive firms to exit the market and allow more innovative firms to enter – can help improve overall economic performance. The process of creative destruction slowed with the onset of the global financial crisis. Business register data show a decline in the rate of enterprise creation as early as 2007 for some of the largest economies. In 2009, the downward trend became more pronounced in several European countries, including the United Kingdom and Russia. After only six years a few countries have returned to the pre-crisis levels of enterprise creation, one of which is the United Kingdom. In the other benchmarked countries the level of enterprises creation

[10] It should be noted that the value-added figures for the SME sector in Austria (61%) could also be influenced by a poorly productive large business sector. Yet, there are no apparent reasons to espouse this explanation, so that the paper keeps the view that the Austrian SME sector is the best performer in the group of benchmarked countries.

continues to be below the pre-crisis levels, which poses a problem both to productivity and social inclusion.

New enterprise creations, 2007-2013

Trend-cycle average 2007 = 100



For the United States, data only refer to establishments with employees.

Germany — Russian Federation — United Kingdom — United States

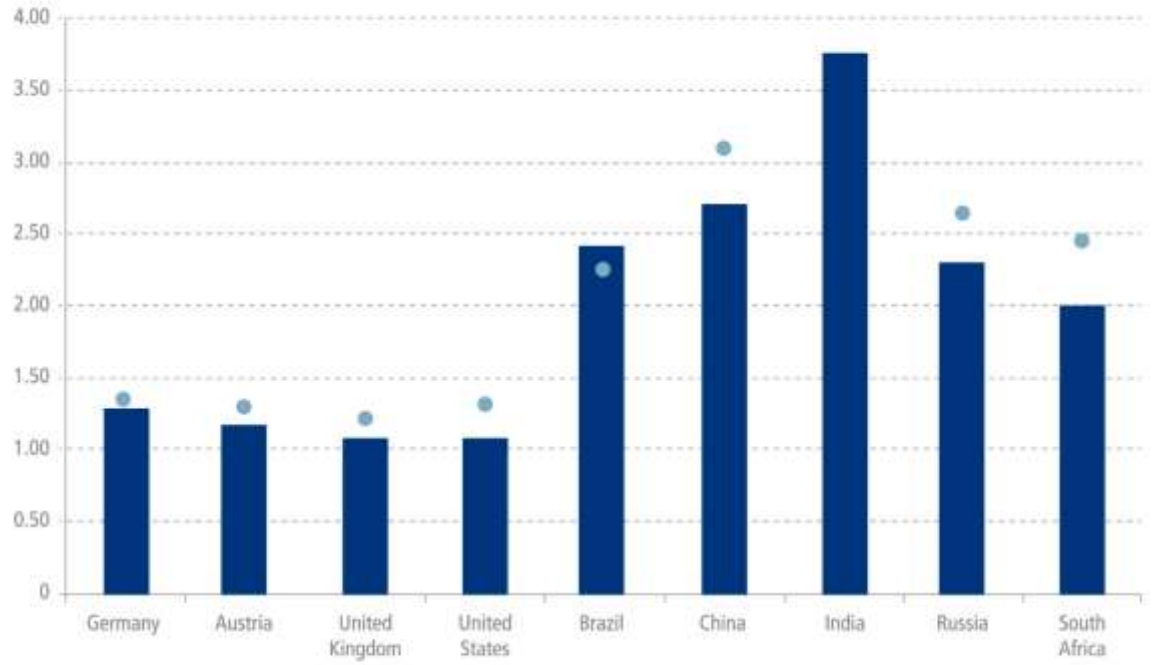
Source: OECD (2013d), Entrepreneurship at a Glance. OECD Publishing, Paris. 2013.

7. Product market regulations are more burdensome in the BRICS

It has been observed that for the BRICS for which data are available, the SME sector contributes less to national employment and value added than in OECD countries. This is partly owing to product market regulations that are less favorable to new and small businesses. Competitive product markets are crucial to entrepreneurship and SME development. An economy in which the state presence is too strong or in which incumbent firms are unduly protected will discourage entrepreneurs from entering the market, curbing the productivity-enhancing role of entrepreneurship. The OECD Product Market Regulation (PMR) index measures the degree to which government policies promote or inhibit competition in product markets by assessing state regulations in three domains: size and scope of state-ownership in the economy; legal and administrative barriers to entrepreneurship; and barriers to international trade and investment (Figure “Product market regulation (PMR) index)”).

Product market regulation (PMR) index, 2013 and 2008

Index value (0=most competitive; 6=least competitive)



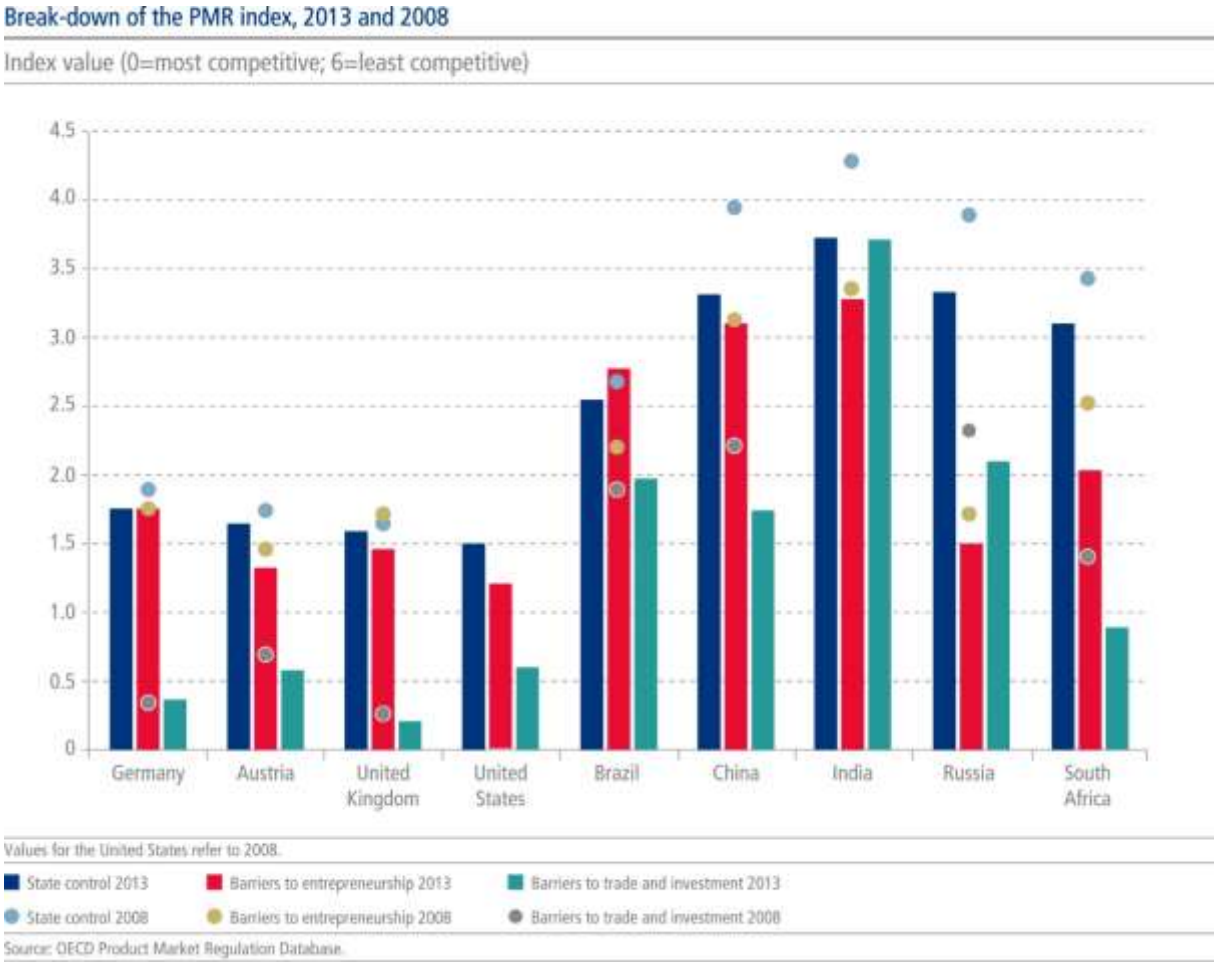
The OECD Indicators of Product Market Regulation (PMR) are a comprehensive and internationally-comparable set of indicators that measure the degree to which policies promote or inhibit competition in areas of the product market where competition is viable. They measure the economy-wide regulatory and market environments in 34 OECD countries in (or around) 1998, 2003, 2008 and 2013, and in another set of non-OECD countries in 2013. They are consistent across time and countries. The indicators cover formal regulations in the following areas: state control of business enterprises; legal and administrative barriers to entrepreneurship; barriers to international trade and investment. Not all data are available for all countries for all years.
Values for the United States refer to 2008 and 2003 respectively. Values for India are only available for 2008.

2013 2008

Source: OECD. Development Centre, Poverty Reduction and Social Development, Migration and the Brain Drain Phenomenon. Paris. 2007.

The four selected OECD countries have very similar standings, which have hardly budged during the last five years. Most progress in the liberalization of product markets was made in the European Union in the late 1990s, and member countries have now achieved a stable position where markets are open to start-ups and foreign investors and where the presence of the state is limited. On the other hand, the BRICS, especially India, have less competitive internal markets for reasons that differ by country (see section below). Nonetheless, with the exception of Brazil, they have made relevant strides in the liberalisation of domestic markets in the last five years.

A break-down of the PMR index in its three macro areas provides a more disaggregated analysis of where the points of strength and weakness of each country lie (Figure “Break-down of the PMR index”).



India is the country that performs the worst in all three areas of state control of the economy, barriers to entrepreneurship, and barriers to trade and investment. Although the weight of the state in the economy has been reduced during the last five years, barriers to entrepreneurship have remained unchanged and are the highest among the benchmarked countries.

In a similar vein, China's barriers to entrepreneurship have not dropped, although China has done more progress than other countries in lowering the state control of the economy and trade and investment barriers, both of which have helped the country to become the world's top manufacturing exporter in gross terms.

Interesting is also the case of Brazil, which is the only country where barriers to trade and investment and barriers to entrepreneurship have increased in the last five years. However, among the BRICS, barriers to entrepreneurship are the highest in India and China and the lowest in Russia and South Africa; the value of the latter, in particular, is not very different from that of OECD countries.

With respect to the selected OECD countries, the disaggregated analysis confirms the similarity of these economies in the relative low weight of product market regulations. Only in one case is there a gap of above half a base point, which is between Germany (1.75) and the United States (1.20) in the barriers to entrepreneurship.

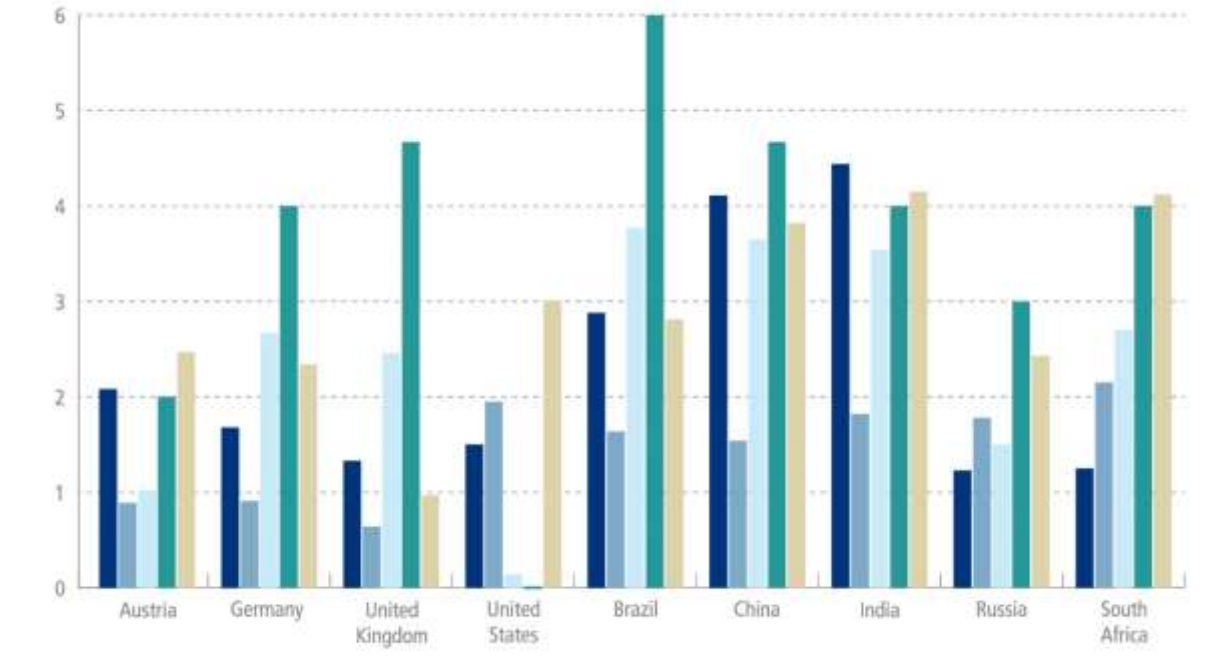
8. A more detailed analysis of ‘barriers to entrepreneurship’ points to areas for reform also in OECD countries

However, a further detailed analysis of selected PMR entrepreneurship indicators suggests that there is still scope for reform in entrepreneurship policies also in the benchmarked OECD countries (Figure “Break-down of “barriers to entrepreneurship” category in the PMR index”). The United Kingdom and Germany, for example, may be in need of an overhaul of their business license and permit system, which scores relatively poorly also when compared with that of some BRICS countries. Germany and the United Kingdom are also the economies with the most complex regulatory procedures among the OECD benchmarked countries. On the other hand, the United States does less well than the others in the liberalisation of network services and in dropping protections for incumbents, both of which are detrimental to the development of entrepreneurial opportunities. Finally, Austria could do more to lower administrative burdens on start-ups.

As to the BRICS, “licenses and permits” is confirmed to be the policy area where bolder reforms are most needed; this is especially true for Brazil. Administrative burdens on start-ups are exceptionally high in India and China, but lower than in the OECD economies in South Africa and Russia. This is corroborated by the indicator on the complexity of business regulations, where Russia and South Africa outperform India, China, and Brazil. Finally, network services are more open to competition in Russia and Brazil than in the other BRICS.

Break-down of "barriers to entrepreneurship" category in the PMR index, 2013

Index value (0=most competitive; 6: least competitive)



Values for the United States refer to 2008.

Admin. burdens on startups | Protection of incumbents | Complexity of regulations | License and permit system | Barriers in network services

Source: OECD Product market regulation database.

III Policy implications

While policy recommendations need to be tailored to the specific national or local context,[11] there are a number of general points that can be made to strengthen innovation and entrepreneurship in OECD and BRICS economies. The OECD-World Bank Innovation Policy Platform provides a comprehensive mapping of policy dimensions relevant to innovation and entrepreneurship development. A graphic overview of this useful online platform is available in the Annex of this paper.

The list provided below, which is non-exhaustive, focuses on the aspects most closely related to innovation in business, while it does not dwell on important underlying factors such as the role of the education and training system for business innovation. It primarily deals with framework conditions and specific business innovation and entrepreneurship policies and programme, and it rests on the work of the OECD Innovation Strategy and of the OECD Centre for Entrepreneurship on issues and policies related to entrepreneurship and SME development (OECD 2010b).

1. Framework conditions conducive to stronger innovation and entrepreneurship

Ensure macroeconomic stability

A sound macroeconomic framework supports investment in new business and business innovation through low and stable inflation rates and by reducing the volatility of real interest rates. Similarly, fickle exchange rates deter business expansion by internationalisation, as entrepreneurs seek to avoid potential financial losses owing to currency depreciation or devaluation.

Foster competition in product and services markets

Competition is a key driver of growth by allowing resources to be allocated more efficiently. Therefore, it is important that incumbent companies are not protected to the disadvantage of new start-ups if entrepreneurship is to unfold its productivity-enhancing role. While competition in product markets has greatly been enhanced during the last 20 years in most OECD economies, more progress can be made in the BRICS economies. Moreover in OECD countries as elsewhere, competition in the services sector has not advanced as much as in other sectors of the economy. This is especially true for network services and utilities which in many cases continue to be supplied by state-owned providers in monopolistic markets.[12]

Open markets to trade and investment

The benchmarking exercise has highlighted how much the world economy is connected and how much the innovative inputs of one country are integrated in the exports of another country. Keeping markets open to trade in goods and services and to international investment contributes to a positive environment for innovation. Thus, governments should pay attention to the quality of their investment policy framework, which includes not only the level of business taxation, but also the fairness and rapidness of the judicial system, a flexible labour market and light business

[11] See, for example, the OECD series of National Studies on SMEs and Entrepreneurship, which has so far covered Poland, Thailand, Mexico, Italy and Russia, or the local reviews which have investigated many regions in OECD countries (e.g. Andalusia and Cantabria in Spain, Marche and Lombardy in Italy). For more information, see www.oecd.org/cfe

[12] For further reference, see the Innovation Policy Platform topic page “Market Access and Innovation” as part of the Innovative Entrepreneurship Module.

regulations. All these aspects impact on the chances of a country to attract foreign investment as well as on the choice of an individual to become an entrepreneur.[13]

Make sure business regulations are not burdensome for business start-up and business expansion

Sound regulatory policy is essential to avoid excessive and burdensome regulations that impede starting up businesses and innovation. It is important to note that, unneeded regulations and inconsistency in the way regulations are applied are especially heavy for new and small firms, which have restrained human and financial resources to deal with administrative requirements. Regulatory impact assessment can help gauge whether the benefits of regulations justify the costs.

Bankruptcy laws should not be punitive or prevent unsuccessful entrepreneurs from trying again. Evidence shows, in fact, that serial entrepreneurs are often those able to set out fast-growing companies since, like any other job, business ownership also benefits from experience. At the same time, reforms in this direction should be wary of possible cases of moral hazard.[14]

Review the tax system to ensure that it does not impede entrepreneurship and innovation

Personal income tax, corporate income tax and social security contributions play an important role in the decisions to open up a business, since they contribute to the opportunity cost of moving from wage employment to self-employment. Similarly, the taxation of capital gains and asset holdings (e.g. wealth tax and property tax) also has a bearing on the choice to become an entrepreneur. High levels of taxation on earned income can arguably increase the appeal of self-employment, because income from this activity can be more easily concealed from tax authorities than wage income. However, this is true only for micro-enterprises, whereas growth-oriented entrepreneurship will find it difficult to avoid taxation and will thus be hindered by high income taxes. In a similar vein, taxation on capital gains will influence the development of secondary markets and thus the possibility for expanding businesses to access to equity finance and for investors to capitalise on their investment.

R&D tax incentives have commonly been used to support business innovation. However, recent OECD analysis shows that the overall tax relief on R&D for multinational enterprises (MNEs) could be greater than in the initial government forecast if MNEs use cross-border tax planning strategies to reduce their overall tax burden. In this way, there is the risk that governments lose tax revenues from the commercialisation of subsidised R&D (OECD 2013a). Targeting R&D subsidies on smaller independent firms which are not part of larger business groups might alleviate public concerns on cross-border tax planning.[15]

Explore the potential of demand-side policies to strengthen business innovation and innovative entrepreneurship

Regulations, standards and public procurement can all be used to promote innovation in a market-friendly way that does not harm competition.[16] Public procurement rules should also avoid favoring

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[13] The Innovation Policy Platform's module page on "Access to Finance and Foreign Markets" discusses this question further.

[14] The Innovation Policy Platform's topic pages on "Bankruptcy Regulation", the "Administrative Framework for Entry and Growth", and "Fiscal Measures" provide further detail.

[15] Further information on the relationship between tax schemes and innovative entrepreneurship is found in the Innovation Policy Platform's topic page "Fiscal Measures".

[16] Further information on "Innovation procurement schemes" is available in the relevant topic page of the Innovation Policy Platform's module on innovative entrepreneurship.

incumbent large companies over new and small firms, for example by bundling contracts or setting restrictive size and age criteria for tendering firms. There is, more generally, a need to make public procurement opportunities more visible to SMEs, including by posting all public tenders online and advertising them through the channels of national and local business associations.

2. Specific policies aimed at business innovation, knowledge networks and innovative entrepreneurship

Ensure sufficient investment in public research and coherence between multi-level sources of funding for R&D

The governance of research institutions and higher education institutions (HEIs) should be such that it enhances excellence, with better linkages to other innovation actors and stakeholders. This includes restructuring the institutional mechanisms of public research financing to better support multidisciplinary research and increase the ability of HEIs to work more closely with industry to bring ideas to market.

Encourage value creation from intellectual property and other intangible assets

Policies should encourage value creation from intangible assets through intellectual proprietary mechanisms (e.g. patents) and the diffusion of such intellectual property through markets and networks. Adequate and effective implementation of intellectual property rights is important to provide the right set of incentives to innovators, although governments need to be wary of the declining quality of patents due to their proliferation in trivial fields. This phenomenon poses a challenge to innovation because it shifts innovations towards marginal improvements and increases uncertainty, thus lowering incentives to invest in inventive activities. Recent decisions by the US Supreme Court and the European Patent Office raising the bar for granting patents go in the right direction.

Intellectual property markets and intellectual property aggregating mechanisms promote the exchange and share of IPRs and are often based on licensing agreements. Examples of IP marketplaces include patent clearing houses, patent auction houses, licensing markets, and technology platforms. Examples of IP aggregating arrangements – which bundle complementary pieces of intellectual property and offer access to the pool – are patent pools and patent funds. Policies should foster the development of these mechanisms, which will require improving market transparency and the correct valuation of intellectual assets.[17]

Remove barriers and regulations that limit industry-university interactions

In a landscape where innovation is collaborative, barriers to industry-university collaboration hinder the commercialisation of research. However, national laws still set obstacles to faculty members who are interested in collaborations with the business sector. Ensuring that researchers have incentives and opportunities to collaborate with industry is important; in this context, for example, research performance evaluation criteria should be adjusted to reflect the so-called “third mission” of universities, beyond teaching and research, which is transfer of knowledge to the private sector (OECD 2008).[18]

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[17] The Innovation Policy Platform’s topic page on “Intellectual Property Rights for Innovative Entrepreneurship” and the module on “Intellectual Property Rights” provide a detailed discussion on various factors and related instruments to strengthen this particular dimension.

[18] This is very much at the core of the “Technology Transfer and Commercialisation” module of the Innovation Policy Platform (within the Innovative Entrepreneurship module).

Moreover, past practices have tended to favor knowledge transfer through technology licensing to established firms, reflecting relatively easy administration, early returns and low risks for the HEI. But in some cases the creation of a portfolio of spinoff companies, in which the university has equity and/or licensing stakes, may provide greater returns. In other cases, collaborative research and consultancy may be more effective. Government should set incentives that encourage universities to find out their optimal mix of means of knowledge transfer.

Foster entrepreneurial culture and skills in the population

With entrepreneurship at a premium, it is important for policy to engender a culture and attitudes that are conducive to business creation. For example, the education system, the media and business support organisations can help foster entrepreneurial motivations. Similarly, adequate entrepreneurship skills – which include small business management skills, strategic skills and entrepreneurial traits – can help new entrepreneurs to succeed. This implies the need for a change in the curriculum, pedagogies, structures and strategies in education and training systems to better import these skills.[19]

Design adequate business financing policies

Lack of external finance is one of the major problems affecting business innovation and entrepreneurship development.[20] The problem is especially exacerbated in small and innovative enterprises. Small enterprises lack collateral and financing reporting of the standards required by banks. Innovative enterprises may paradoxically be considered more exposed to risks and uncertainty than non-innovative enterprises. For example, there is evidence that fast-growing firms find it more difficult to obtain loans than other SMEs.[21] Governments need to design policies that ease access to finance for innovative firms. Special segments of credit guarantee funds earmarked for innovative firms are an option, as well as setting a regulatory framework that favors the development of alternative forms of finance such as convertible and subordinated loans. Government support of equity finance, especially in the early stages of innovation development, is also relevant, although it requires strong coordination with private sector investors (OECD, forthcoming).

[19] Additional information can be found in the Innovation Policy Platform's topic page on "Entrepreneurial capabilities and culture".

[20] Further information is available in the "Access to finance for innovative entrepreneurship" topic page in the Innovation Policy Platform.

[21] See, for example: https://www.innovationpolicyplatform.org/content/debt-financing

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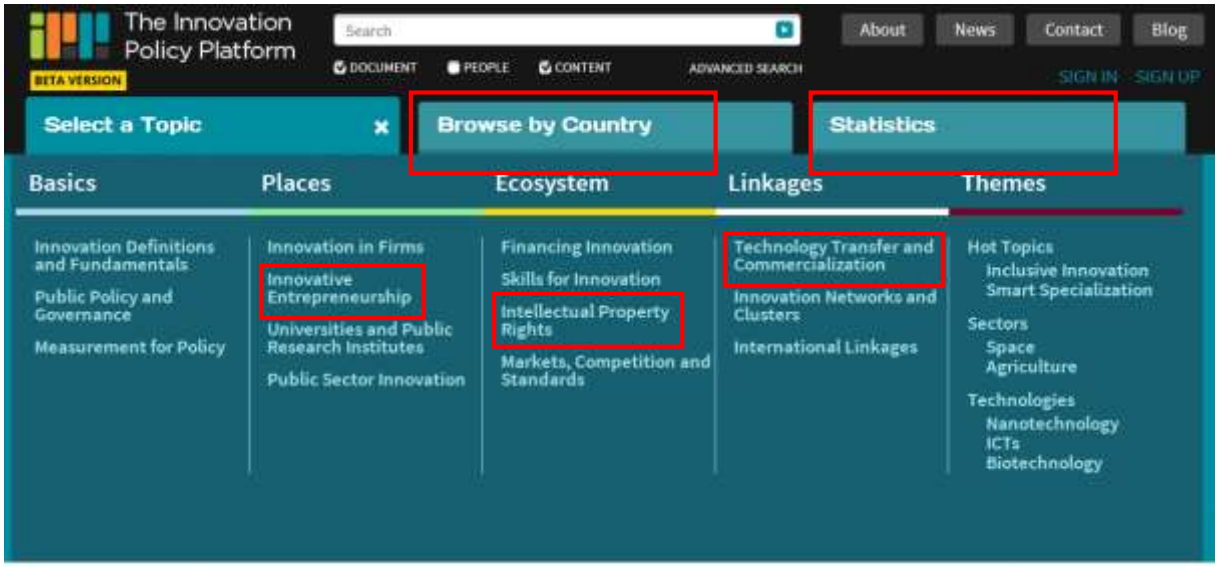
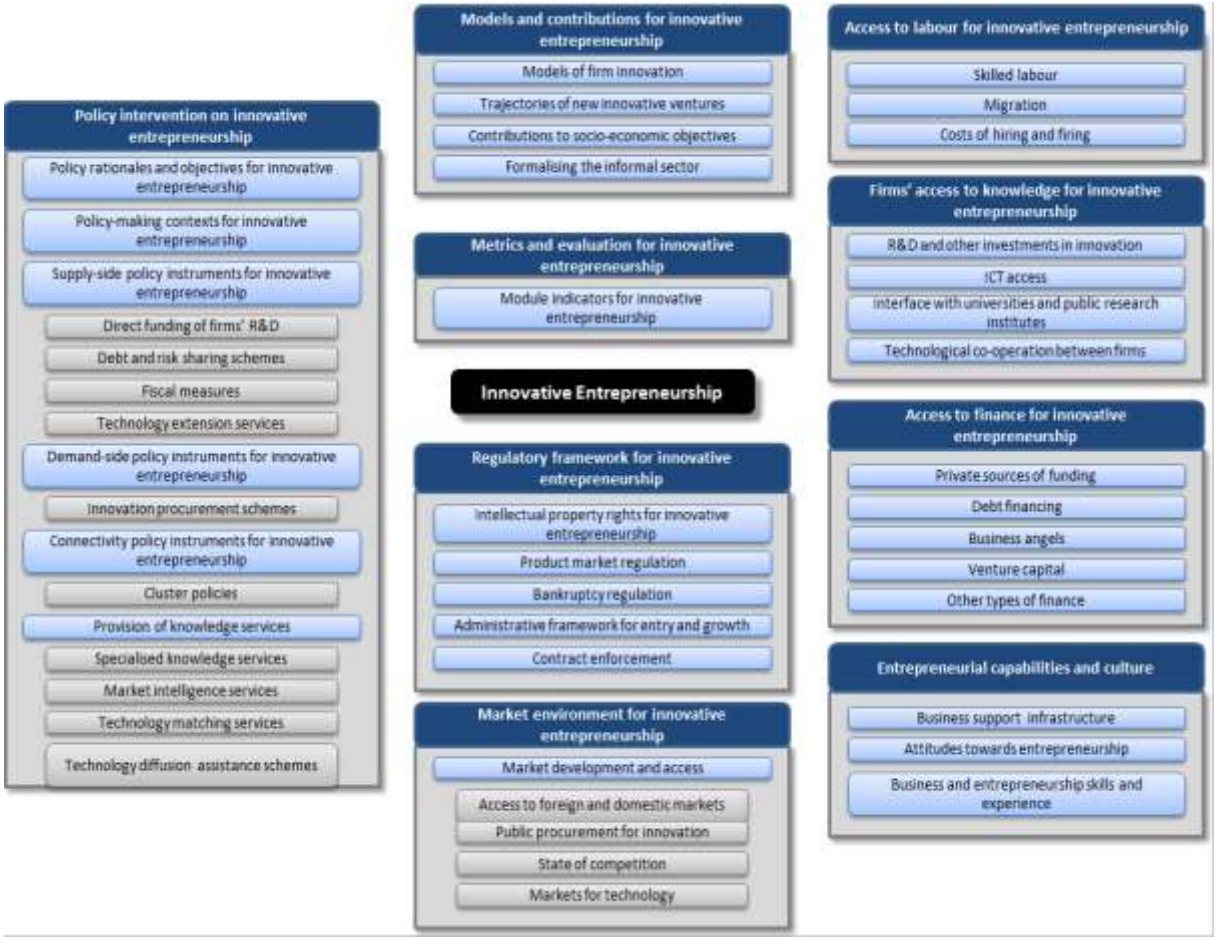
Annex 1: A snapshopt of the Innovation Policy Platform Website

The Innovation Policy Platform (IPP) is a one-stop shop to support innovation policy, developed jointly by the OECD and the World Bank. It provides an online repository of reports and data to support better innovation policy making and analysis. Rectangles in the first snapshot indicate modules and links of relevance to the focus of this paper. The second snapshot gives a comprehensive overview of the issues and policies tackled in the module on "innovative entrepreneurship", which is especially relevant to this paper.




Policy intervention on innovative entrepreneurship
Policy rationales and objectives for innovative entrepreneurship
Policy-making contexts for innovative entrepreneurship
Supply-side policy instruments for innovative entrepreneurship
Direct funding of firms' R&D
Debt and risk sharing schemes
Fiscal measures
Technology extension services
Demand-side policy instruments for innovative entrepreneurship
Innovation procurement schemes
Connectivity policy instruments for innovative entrepreneurship
Cluster policies
Provision of knowledge services
Specialised knowledge services
Market intelligence services
Technology matching services
Technology diffusion assistance schemes
Models and contributions for innovative entrepreneurship
Models of firm innovation
Trajectories of new innovative ventures
Contributions to socio-economic objectives
Formalising the informal sector
Metrics and evaluation for innovative entrepreneurship
Module indicators for innovative entrepreneurship
Innovative Entrepreneurship
Regulatory framework for innovative entrepreneurship
Intellectual property rights for innovative entrepreneurship
Product market regulation
Bankruptcy regulation
Administrative framework for entry and growth
Contract enforcement
Market environment for innovative entrepreneurship
Market development and access
Access to foreign and domestic markets
Public procurement for innovation
State of competition
Markets for technology
Access to labour for innovative entrepreneurship
Skilled labour
Migration
Costs of hiring and firing
Firms' access to knowledge for innovative entrepreneurship
R&D and other investments in innovation
ICT access
Interface with universities and public research institutes
Technological co-operation between firms
Access to finance for innovative entrepreneurship
Private sources of funding
Debt financing
Business angels
Venture capital
Other types of finance
Entrepreneurial capabilities and culture
Business support infrastructure
Attitudes towards entrepreneurship
Business and entrepreneurship skills and experience