

Chapter 4

The business environment for innovation

Policies for innovation also rely on a sound business environment that encourages investment in technology and in knowledge-based capital; that enables innovative firms to experiment with new ideas, technologies and business models; and that helps them to grow, increase their market share and reach scale. New issues and policy learnings relevant to framework conditions that have emerged from the OECD's work on innovation relate to the appropriate framework conditions to benefit from investment in knowledge-based capital, tax policies related to innovation, the financing of innovation, as well as policies that enable experimentation and growth among young innovative firms. The work also emphasises the growing importance of global value chains (GVCs), and the implications this has for framework conditions that affect innovation, notably in regard to trade, investment and regulatory policies. Investment policies are important too, given the growing importance of investment in knowledge-based assets.

4.1. The role of framework conditions

The 2010 Innovation Strategy (OECD, 2010a) stressed the importance of sound framework conditions for innovation, including sound macroeconomic policy, competition, well-functioning product and labour markets, openness to international trade and investment, innovation-friendly tax systems, and financial systems that enable resources to flow to innovative activities. The main findings of that work were:

- Fiscal discipline and low and relatively stable inflation help to reduce uncertainty and enhance the efficiency of the price mechanism in allocating resources. Strong and stable rates of output growth also support firms seeking to introduce new products or undertake significant organisational changes.
- Strong competition encourages companies to innovate and develop new markets. Elimination of anti-competitive product market regulations is a powerful way to stimulate investment in innovation and supports the process of creative destruction. In addition, sound, proactive competition policies in line with international best practice can encourage innovation.
- More open trade in services, reduced barriers to merchandise trade across borders, modernised public procurement and a sound international framework for intellectual property rights (IPR), along with the effective enforcement of these rights, should foster innovation. The successful conclusion of the Doha Development Agenda by the World Trade Organization (WTO), and improved market access for goods and services, would be significant steps towards further market opening.
- Governments should consider the quality of their policy frameworks for investment. These frameworks are important in determining how much investment an economy receives. They also affect the extent to which this investment contributes to economic development and acts as a driver of innovation.

The importance of such framework conditions has increased in recent years as businesses and capital have become more mobile and seek the most favourable operating environments internationally. Moreover, the economic crisis and its aftermath have had wide-ranging impacts on many key framework conditions, notably the macroeconomic and financial environments. Reaping the benefits of innovation at national, regional and local levels requires governments and other stakeholders to undertake the investments and structural reforms that provide a good environment for engaging in innovation. The OECD's regular assessment of structural policies shows that much scope remains for productivity- and innovation-enhancing reforms, notably in product markets (OECD, 2014a).

Since the completion and release of the Innovation Strategy in 2010, a number of new issues and policy learnings relevant to framework conditions have emerged from the OECD's work on innovation. These particularly relate to the following themes:

1. The appropriate framework conditions to benefit from **investment in KBC**. In several OECD countries, investment in KBC – software, data, intellectual property, and

economic competencies such as brand equity, new organisational methods and firm-specific skills – is now larger as a proportion of gross domestic product (GDP) than investment in tangible capital. The growth of this form of investment raises several challenges for policy, including the need to improve a range of framework conditions.

2. **Tax policies**, including tax policies related to investment in knowledge-based assets.
3. The **financing of innovation**, which has grown in importance as a policy concern since the 2008 financial crisis, and which continues to be a challenge in many countries.
4. The framework conditions that enable **experimentation and growth among young innovative firms**. Such firms are a major source of employment growth and are also important for innovation, in particular for more radical innovation.
5. The growing importance of **global value chains (GVCs)**, and the implications this has for framework conditions that affect innovation, notably in regard to trade, investment and regulatory policies.
6. **Investment**, notably ongoing revisions to the OECD's Policy Framework for Investment.

There are several other aspects of the environment for business that could be considered as framework conditions, e.g. trust, security and good governance. These are not discussed in this Chapter of the report, but will be addressed in Chapter 8.

4.2. Knowledge-based capital

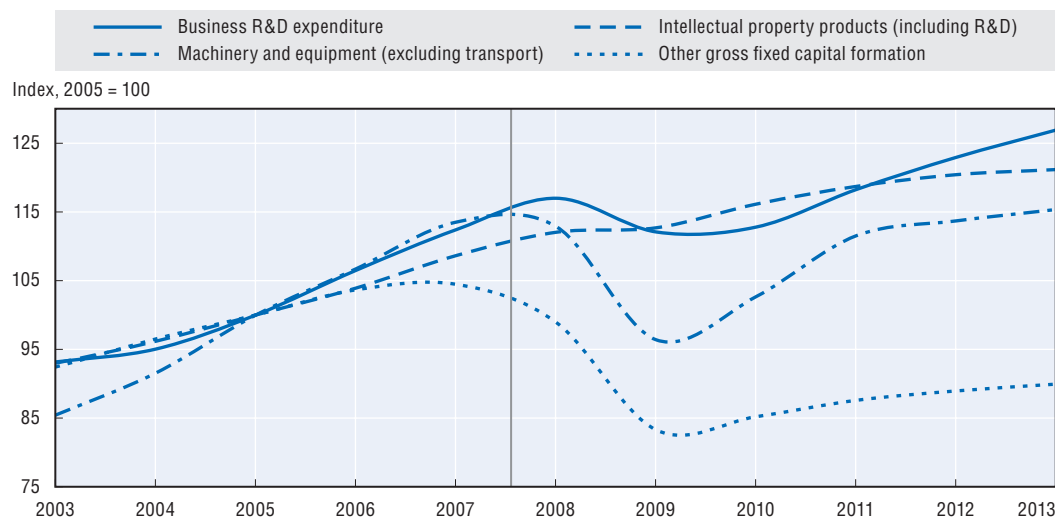
KBC refers to a range of assets – typically intangible – that are based on investment in knowledge, including R&D, software and data, intellectual property, brand equity, firm-specific skills, and organisational know-how. Estimates for a wide range of OECD economies and a number of emerging economies show that business investment in KBC has risen rapidly during recent decades, often at a faster pace than investment in traditional physical capital (such as machines, equipment and buildings). During the global economic crisis, business investment in KBC declined less than investment in physical capital (Figure 4.1). Investment in KBC is also an essential ingredient for firms wishing to upgrade in GVCs, as it often facilitates differentiation from competitors. The growing importance of KBC raises a number of challenges for policy.

First, the impact of investment in KBC is greatly enhanced when resources can flow easily to KBC-intensive firms, so that these can grow and increase their market share (Andrews and Criscuolo, 2013). Given the inherent difficulties in allocating KBC efficiently, policies that facilitate the redeployment of tangible resources take on heightened importance. Specifically, well-functioning product, labour and capital markets and bankruptcy laws that do not overly penalise failure can raise the expected returns to investing in KBC. These benefits are realised partly through stronger competitive pressures and more efficient reallocation, which make it easier for successful firms to implement and commercialise new ideas. Benefits also arise from lowering the costs of failure, encouraging firms to experiment with uncertain growth opportunities.

Second, the rise of KBC implies an increasing importance – and in some cases changes in form or emphasis – for a number of types of policy (see OECD, 2013a). For example, **competition policy** faces new challenges in industries founded on KBC. This is particularly so in the digital

economy, where never before have leading firms grown so large so quickly and where the nature of competition often differs in some respects from other sectors. Some experts have observed, for example, that unlike traditional manufacturing sectors, the digital economy's most meaningful competition takes place among platforms created by companies that use very different business models, rather than among companies that all follow more or less the same model. Apple, Google and Microsoft illustrate this point. They all compete in the market for mobile phone operating systems, but each uses a different business model. In such contexts, competition *among* the platform providers may be more important to innovation and consumer welfare than competition *within* the platforms (such as rivalry among companies that create apps for the iPhone). Competition policy should: 1) properly account for inter-platform competition; 2) promote the elimination of unnecessarily anti-competitive product market regulation; and 3) include the effective enforcement of competition law, which will protect and encourage innovation. Moreover, the previous work on KBC (OECD, 2013a) noted an important link between competition policy and IPR (see Chapter 5), noting that IPR systems must be coupled with pro-competition policies and efficient judicial systems.

Figure 4.1. **Business investment in knowledge assets weathered the crisis better and recovered earlier**



Note: In national accounts, spending on R&D activities is treated as expenditures and not as investment, and is therefore not capitalised. R&D capitalisation should be effective as from 2014. Intangible property products are non-financial fixed assets that mainly consist of mineral exploration, computer software, entertainment, and literary or artistic originals intended to be used for more than one year. Other gross fixed capital formation includes dwelling and transport investments.

Sources: OECD (2015a), *Main Science and Technology Indicators 2014-II*, OECD (2015b), *OECD National Accounts Database*, <http://stats.oecd.org/>, accessed on March 2015, based on OECD (2014b), *OECD Science, Technology and Industry Outlook 2014*, OECD Publishing, Paris, http://dx.doi.org/10.1787/sti_outlook-2014-en.

Another important framework condition that is relevant to KBC concerns **corporate reporting**. The value of many of the world's most successful companies resides almost entirely in their KBC. At the start of 2009, for example, physical assets accounted for only about 5% of Google's worth. Nevertheless, corporate financial reports provide only limited information on companies' investments in KBC. This may hinder corporate finance and governance. Governments could: 1) support better corporate disclosure by

establishing voluntary recommendations and guidelines or backing existing private-sector reporting initiatives; 2) create mechanisms to facilitate companies' reporting of investments in KBC; 3) introduce frameworks for auditors; and 4) engage in global co-ordination, given that there is no global policy-related body addressing this issue.

The OECD's work on KBC also demonstrates there is a need to broaden the notion of framework conditions in an economy increasingly founded on investments in knowledge. For example:

- **Intellectual property rights:** As discussed in greater detail in Chapter 5, because intellectual property is becoming a more important asset for firms in many sectors of the economy, a well-functioning and efficient IPR system is essential to ensure that firms can benefit from their investments in intellectual assets, indicating that this has become a core framework condition.
- **Big data – creating economic value from large data sets:** As examined in Chapter 5, “big data” is part of the leading edge of business innovation and has become a core asset. Research shows that companies that base key decisions on data analytics tend to outperform other firms. While optimal policy is still unclear in this fast-evolving field, it is evident that to unlock major economic benefits, all OECD governments must do more to implement coherent policies in the fields of privacy protection, open data access, ICT infrastructure and ICT-related skills. Policy makers also need to make provision for new regulatory challenges that will come about because of data and machine intelligence.

Policy makers will also need to adopt an enlarged concept of innovation – beyond the conventional view in which R&D is pre-eminent. For example, most OECD governments try to help businesses gain easier access to advice and information on technology and research. They do this through various forms of programme, such as innovation vouchers and technical outreach initiatives. The OECD's work on KBC suggests that an exclusive focus in such schemes on STEM is too narrow. In the United Kingdom, for instance, nearly half of academics from the creative arts and media are engaged with business in some way. This reality, which reflects the changing nature of innovation, also needs to be reflected in government programmes.

A fuller understanding of innovation and growth also requires that governments do more to properly measure investments in KBC and agree on common measurement guidelines. For instance, OECD (2013a) reveals that business investment in organisational capital is perhaps twice as important as previously thought. Policy models reliant on forecasts of growth and productivity change are likely to be inaccurate to the extent that KBC is omitted or mismeasured. By omitting some important forms of KBC, conventional national accounts are mismeasuring the levels and rate of growth of aggregate savings and investment, of GDP and of labour's share of national income, and misallocating the sources of productivity growth. Arguments can be made for expanding the scope of national accounts to better capture additional elements of KBC, in addition to R&D that is just being capitalised in the national accounts (or for creating supplementary innovation accounts). Furthermore, if governments use innovation targets – such as the Lisbon Agenda's guideline for national R&D spending of 3% of GDP – then these should be based on the wider innovation indicators provided by KBC.

4.3. Tax policies

Tax policies are another framework condition that has important impacts on the decisions of firms and households to save or invest and on innovative activity. Important policy features include the level of taxes that are raised, the tax mix, the complexity of tax rules and a host of other factors (OECD, 2010b). The OECD analysis indicates that some forms of taxation, e.g. corporate taxes, are more harmful to growth and innovation than others, e.g. taxes on immovable property, with personal taxes and consumption taxes in between these two, resulting from their respective impacts on the economic decisions of firms and individuals. Growth- and innovation-enhancing policies aim at shifting the tax burden from incomes to consumption and/or residential property. Scope also exists in many countries to make the design of the various categories of tax more conducive to economic growth by levying them on a broader base, possibly at a lower rate, rather than providing targeted relief, except where such reliefs can be justified as externality-correcting.

Other tax policies that are important for the business environment for innovation are top marginal personal income tax rates, which should be set to avoid undue damage to human capital formation and entrepreneurship. Taxes that correct for specific externalities, e.g. environmental taxes, are also important for innovation, notably in supporting a shift in the direction of innovation towards greener growth (see Section 7.4). In general, a growth-oriented tax system may want to create as few obstacles as possible to the growth of economic activities. This implies also that tax systems should not discourage risk-taking or discourage the possible inflow of high-skilled and other foreign workers. Moreover, they should stimulate not only the creation but also the adoption of domestic and foreign created intellectual property. Tax systems can contribute to the creation of an attractive business climate, implying also that the restructuring of business activities for economic purposes should not be discouraged, although governments may want to ensure that they receive their fair share of tax revenues. Growth-oriented tax systems should also contribute to the creation of a favourable e-business and e-commerce environment.

Specific tax policies related to innovation matter too. Tax support to increase the incentives for businesses to undertake R&D is central to many governments' efforts to foster innovation. Most OECD countries offer significant tax relief for business spending on R&D, in recognition of the growth-enhancing spillover benefits of R&D for the general economy. The number of countries providing such relief, and its generosity, are rising. But overall tax relief for R&D by multinational enterprises (MNEs) could well be greater than governments foresaw when R&D tax incentives were initially designed. In particular, rates of tax incentive may not have taken into account tax relief on returns to R&D achieved by MNEs through cross-border tax planning strategies. Accordingly, many governments may be giving unintentionally high levels of total tax support for R&D.

Tax policy may also be encouraging the transfer of KBC to offshore holding companies, and the use of KBC in foreign rather than domestic production. Consequently, losses of tax revenue from R&D may be occurring, along with losses of the benefits from domestic knowledge spillovers. At the same time, relative to MNEs, pure domestic firms – including SMEs but also certain large companies that do not have foreign affiliates and thus do not

have cross-border tax planning opportunities – may be placed at a competitive disadvantage in undertaking and exploiting R&D. These findings have significant implications for public finance and domestic employment, the cost-effectiveness and nature of government efforts to encourage business investment in R&D, and the efficiency of OECD economies in accumulating KBC (OECD, 2013a). The OECD’s work on base erosion and profit shifting (BEPS) is seeking to address some of these important challenges (OECD, 2013b). Further discussion on R&D tax credits and other tax credits related to innovation is included in Chapter 6.

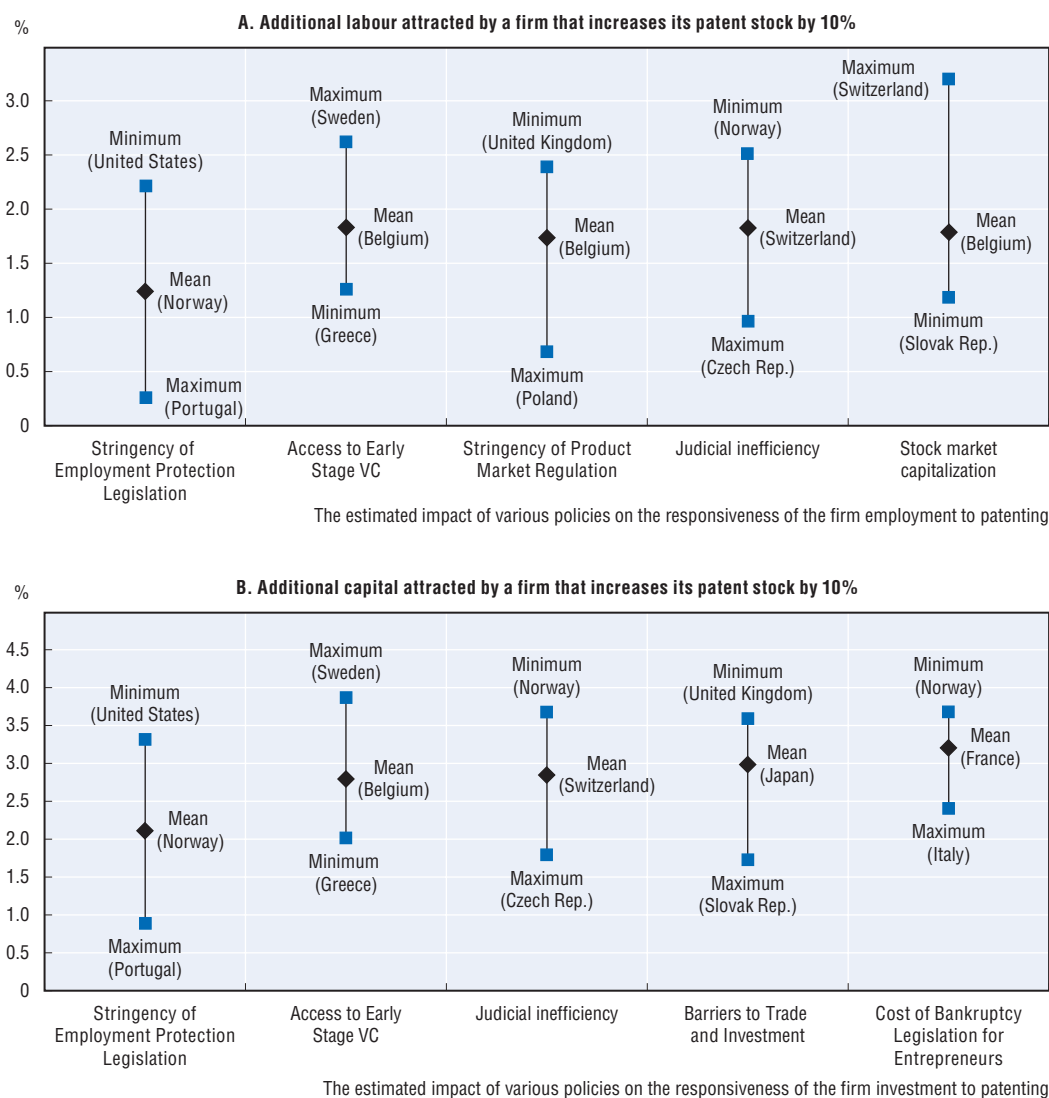
4.4. Financing of innovation

Access to finance is a key challenge for innovative enterprises. External financing is especially important when innovative firms, particularly young firms, begin to grow, at which point financing requirements become too large to be met by family and friends. Indeed, the financing gap that affects innovative firms is often a “growth capital gap”. Traditional debt finance generates moderate returns for lenders and is therefore more appropriate for established businesses with a low-to-moderate risk profile. Furthermore, for innovative ventures with new technologies or untested business models, the problem of asymmetric information between entrepreneurs and financiers is especially severe. This is particularly so for seed and early-stage firms as well as for SMEs, which typically lack a track record and collateral and are often more opaque than large companies. Financing constraints can also be severe for firms reliant on intangible assets, which can be highly firm-specific and difficult to use as collateral in traditional debt relationships (OECD, 2010c, 2014c).

The availability of financing for innovation is influenced by a range of policies. For example, recent OECD work has examined the relationship between framework policies and the extent to which resources (labour and capital) are allocated to firms that have filed patents (an imperfect but useful proxy for innovation). The analysis indicates that cross-country differences in policy settings provide some explanation of the variation in expected returns from patenting (Andrews, Criscuolo and Menon, 2014). Specifically, Figure 4.2 illustrates how estimated resource flows to patenting firms vary with different policy settings in OECD countries. In this figure, the length of the bars indicates the percentage change in employment (Panel A) and capital (Panel B) associated with a 10% increase in the patent stock when the policy variable of interest is set equal to the minimum, mean and maximum values across the sampled countries. For example, capital and labour flow more readily to firms that patent in Sweden, where access to early-stage venture capital (VC) financing is conducive, than in Greece, where this is less so.

The data indicate significant benefits from increased access to seed and early-stage financing, as well as from increased efficiency in the judicial system. In addition, benefits arise from reforming product market regulations (PMRs) that inhibit competition, as well as reducing policy-induced barriers to exit (e.g. excessively strict bankruptcy codes). Reducing such barriers will accentuate competitive pressures, encouraging inefficient firms to exit, and channel resources to firms that are best able to make use of the resources. The latter effect can also be encouraged by less stringent employment protection legislation. While such measures are typically implemented with other policy objectives in mind, their unintended implications for innovation should be taken into account.

Figure 4.2. Framework policies and resource flows to patenting firms, 2003-10



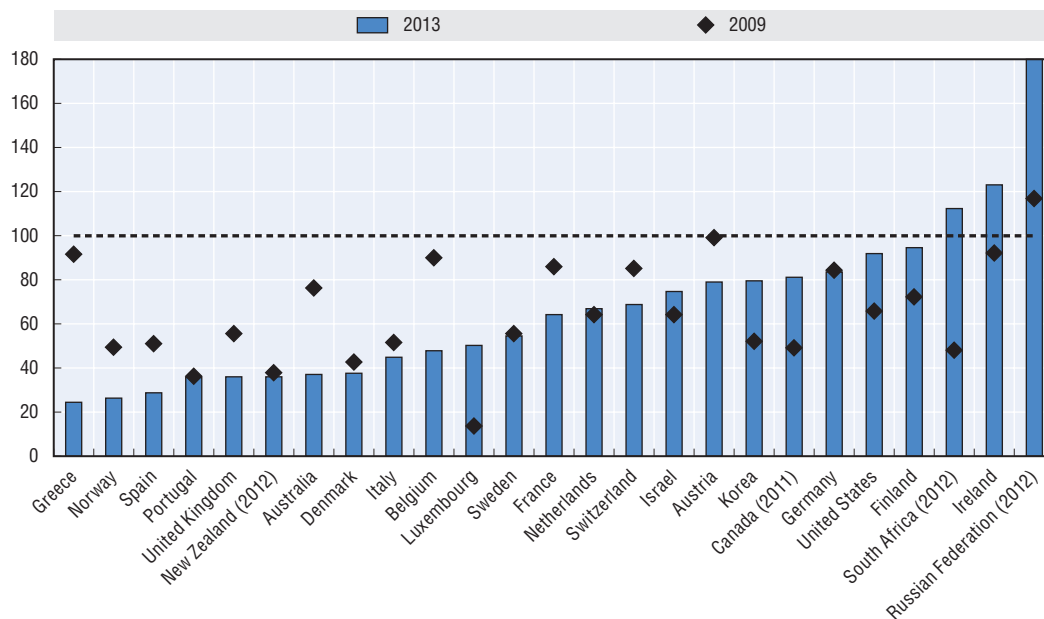
Note: This figure shows that the sensitivity of firm employment and capital to changes in the patent stock varies according to the policy and institutional environment. To calculate policy effects, coefficient estimates are combined with the average values of the policy indicators for each country over the sample period. The labels “minimum” (“maximum”) denote the country with the lowest (highest) average value for the given policy indicator over the sample period.

Source: Andrews, D., C. Criscuolo and C. Menon (2014), “Do resources flow to patenting firms? Cross-country evidence from firm level data”, doi: 10.1787/18151973.

The above examples suggest that framework policies could significantly affect the extent to which patenting firms attract the tangible resources required to implement and commercialise new ideas.¹ In general, the effects are far from trivial. For example, Panel A shows that the sensitivity of firm employment to changes in the stock of patents is more than three times larger when PMR is relatively low (e.g. the United Kingdom), compared with when PMR is very stringent (e.g. in Poland). Many OECD countries have improved their policies in recent years, and the values of the OECD indicator of PMR have decreased in all countries in the sample over the last decade, and in some cases by a considerable margin (e.g. Poland, Greece, Hungary, Slovak Republic).

Framework policies are one important factor that affect the financing of innovation. Another important factor concerns financial markets, including financing for SMEs and the provision of risk capital. In many OECD countries, the global financial crisis exacerbated the financial constraints experienced by SMEs. External financial resources dried up for many innovative enterprises. Following regulatory reforms in financial markets (e.g. Basel III), banks face more rigorous prudential rules, which risks restricting credit for business. The financial crisis also severely affected equity markets. In 2013, in most countries, the level of VC investment was still below the pre-crisis level, and in some cases even below the level reached in 2009 (Figure 4.3). Seed and early-stage capital have been impacted most, with a large number of VC funds shifting to later-stage investments. While assets under management in private equity funds experienced a dramatic surge in the pre-crisis period, the sector has stagnated since 2008, in spite of increasing investor interest in alternative investment instruments. In part, this stagnation reflects decreased exit opportunities for investors. In particular, stock markets declined as a destination for growth companies, as seen in the falling number of initial public offerings (IPOs) across the globe. Furthermore, over the period 2010-13, the number of VC-backed exits through mergers and acquisitions fell continuously.

Figure 4.3. Venture capital trends, 2007 = 100



Source: OECD (2014d), *Entrepreneurship at a Glance 2014*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/888933064753>.

The range of financing instruments available to the business sector needs to be broadened. Increasingly complex and interconnected financial markets offer opportunities to service the needs of innovative entrepreneurs and SMEs. Strengthening seed and early-stage equity finance, including VC and angel investment, can boost the creation and development of innovative ventures. And other mechanisms in the capital market, such as public listings for SMEs, can provide financial resources for established growth-oriented firms.

Over the last decade policy makers across OECD countries have intervened to boost the supply side of the equity market, providing *front-end* tax incentives (i.e. tax deductions on investments in seed and early-stage ventures), and *back-end* tax relief (which relate to capital gains and losses). Governments have also increased direct interventions to sustain the supply-side of the venture capital market by creating new government VC funds, and introducing fund-of-funds and public/private co-investment funds. Policies now also target training, mentoring and coaching for investors (Wilson and Silva, 2013).

However, the demand side of equity markets has received less policy attention. Investment readiness programmes help entrepreneurs to better understand the needs and expectations of potential investors and improve the quality and presentation of their business plans.

Other financing techniques exist in the broad risk/return spectrum. These include: asset-based finance, whereby firms obtain funding based on the value of specific assets, including intangible assets, rather than on the firm's overall credit standing; alternative forms of debt, such as corporate bonds, which can provide mid-sized to large firms with liquidity to undertake innovative investments; and hybrid instruments, which combine debt and equity features, and may serve both young and established companies that seek expansion capital but are not suitable for public listing or do not want the dilution of control that would accompany equity (OECD, 2014c). Since the late 2000s, crowdfunding, by which external finance is raised through web platforms, has been growing rapidly, although it still represents a very minor share of all business financing (and serves to finance specific projects rather than an enterprise). However, as crowdfunding becomes more regulated, it is expected to play a growing role, including for the financing of innovative ventures, as the online interaction with large numbers of customers may help entrepreneurs to validate untested products (OECD, 2014e).

Challenges exist to increase innovative firms' uptake of alternative investment instruments. These challenges can be met by improving finance-related skills in new and small firms, designing regulations that balance financial stability with the opening of new financing channels for entrepreneurs, and developing infrastructures to reduce information asymmetries and encourage investor participation. Furthermore, in the aftermath of the global financial crisis, as private investors withdrew from some higher-risk market segments, the public share of funding significantly increased. A key challenge therefore is to implement policies that lever private resources and develop mechanisms for sharing risk with the private sector. In recent years, programmes have developed in many OECD countries to favour co-investment, particularly in seed and early-stage ventures (see OECD, 2011a).

4.5. Fostering entrepreneurship and experimentation

In the past, a great deal of attention has been devoted to policy measures that seek to push out the technology and innovation frontier. The expectation is that the benefits of innovation will accrue not only to firms at the frontier, but will also spill over to other firms, increasing productivity in the economy more generally. However, it is becoming increasingly clear that the distribution of firm productivity is characterised by a large number of "average" firms, with just a minority of firms exhibiting high levels of productivity. For example, among four-digit manufacturing industries in the United States, firms at the 90th percentile of the total factor productivity (TFP) distribution are, *on average*, twice as productive as firms at the 10th percentile (Syverson, 2004). In China and India, the differential is fivefold (Hsieh and Klenow, 2010). Moreover, there is evidence that this productivity gap is increasing.

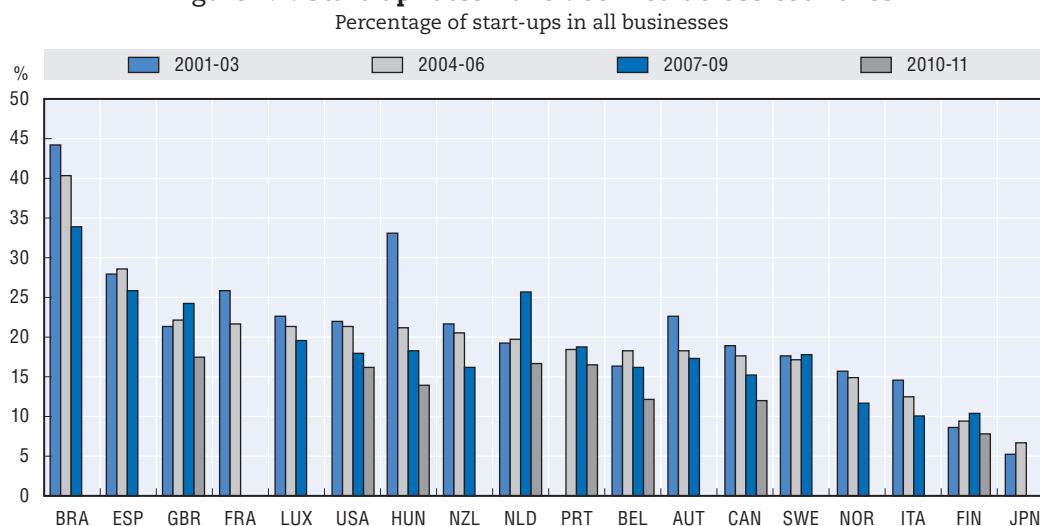
Owing to such productivity differentials, increased attention is being paid to the allocation of resources across firms in any given economy, and the role that policy can play in encouraging efficiency-enhancing reallocation. In particular, policy settings that affect firm entry and exit, and the growth of young firms, will affect the extent to which resources are allocated to more productive firms. Recent OECD work shows the extent to which, across countries, resources (in this case labour) flow to more productive firms (Andrews and Cingano, 2014). For example, in Sweden and the United States, the more productive manufacturing firms account for a higher share of employment than would be the case if labour were allocated randomly across firms. The efficiency of resource allocation is generally lower in market services than in manufacturing, reflecting less exposure to international competition and the fact that pro-competition product market reforms have generally been more extensive in the manufacturing sector than the services sector. Policy settings must provide incentives to ensure that dynamic reallocation occurs on a continuous basis. New and young firms are often the vehicles through which innovations enter the market. This occurs through the introduction of incremental innovations, disruptive technologies, new business models or other forms of KBC (e.g. new marketing strategies).

While patenting is an imperfect measure of innovation, a comparison of firms' patent filings and firm age can be used to document the importance of new and young firms for innovation (Squicciarini and Dernis, 2013). They find that most first patenting happens between the birth of a firm and its tenth year of existence. A notable proportion of firms also apply for patents *before* the firm is established. This may occur when start-ups are created to exploit intellectual property developed by founders, or when mergers and acquisitions involve firms with patents that pre-date the creation of the merging or acquiring firm. Moreover, in addition to their relatively higher patent counts, young firms also tend to have a stock of patents that reflect more radical inventions (Andrews, Criscuolo and Menon, 2014).

Given the importance of new and young firms as vehicles through which innovations enter the market, the role of entry is clearly significant. Furthermore, policy settings can play an important role in determining rates of entry. For example, PMRs can serve as barriers to entry, restricting competition in the market. In addition, capital market failures may particularly affect entrants and young firms, and affect productivity through a less efficient selection of firms at entry (Andrews and Cingano, 2014).

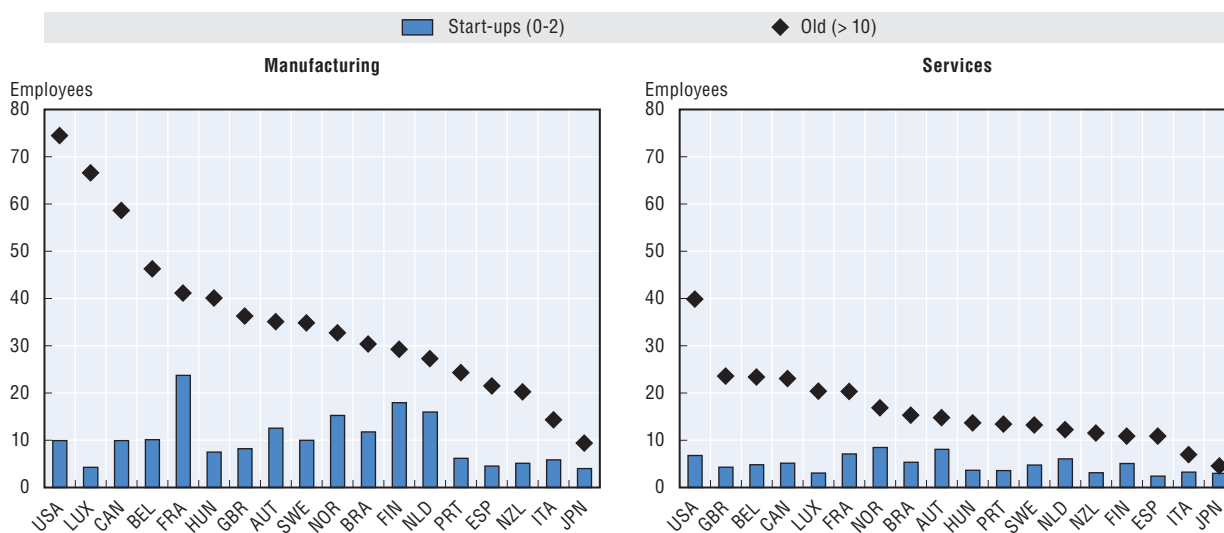
New micro-aggregated data collected by the OECD from 18 countries indicate that, across all countries in the sample, the share of start-ups has steadily decreased over the past decade (Figure 4.4). Indeed, evidence from the United States and other countries indicates that this trend has been in place for two decades or more. Furthermore, the trend has been exacerbated by the recent crisis (Criscuolo, Gal and Menon, 2014).

Subsidies to incumbents and other policy measures that delay the exit of less-productive firms might stifle competition and slow the reallocation of resources from less to more productive firms. Examples include regulations that are less stringent for incumbents (e.g. fiscal measures that favour well-established firms – such as R&D tax credits that do not have carry-forward provisions). Perhaps most importantly, bankruptcy legislation that excessively penalises failure is likely to reduce incentives for the efficient exit of less-productive firms, which would otherwise free up resources for more productive uses.² There are also potential complementarities among such policies; the efficiency of R&D tax credits might be enhanced by policies that facilitate the exit of poorly performing firms.

Figure 4.4. **Start-up rates have declined across countries**

Note: The figure reports start-up rates (defined as the fraction of start-ups among all firms) by country, averaged across the indicated three-year periods. Start-up firms are firms aged between 0 and 2 years.

Source: Criscuolo, Gal and Menon (2014), "The dynamics of employment growth: New evidence from 18 countries", <http://dx.doi.org/10.1787/5jz417hj6hg6-en>.

Figure 4.5. **Average size of start-up and old firms across industries and across countries**

Note: The figure reports the average size of start-up firms (from 0 to 2 years old) and firms more than 10 years old, over the available years. The period covered is 2001-11 for Belgium, Canada, Finland, Hungary, the Netherlands, the United Kingdom and the United States; 2001-10 for Austria, Brazil, Spain, Italy, Luxembourg, Norway and Sweden; 2001-09 for Japan and New Zealand; 2001-07 for France; and 2006-11 for Portugal. The sectors covered are manufacturing and non-financial business services. Owing to methodological differences, figures may deviate from officially published national statistics. For Japan, the data are at the establishment level. For other countries, data are at the firm level. Data for Canada refer only to organic employment changes and abstract from merger and acquisition activity.

Source: Criscuolo, Gal and Menon (2014), "The dynamics of employment growth: New evidence from 18 countries", <http://dx.doi.org/10.1787/5jz417hj6hg6-en>.

While entry and exit are clearly important, post-entry dynamics are even more critical. Figure 4.5 shows differences across countries in the extent to which young firms grow. While there are some differences across countries in the size of start-ups at entry, these are not particularly striking. However, the situation is markedly different

when considering older businesses. For instance, on average, an older manufacturing business in France is half the size of one in the United States, even though start-ups in France are larger than in the United States. In some countries, such as Italy, there is only a small difference between the size of start-ups and that of mature firms. In recent years, Italy has undertaken a range of reforms to improve the conditions for start-ups and help them grow (Box 4.1).

Box 4.1. Recent policies in Italy to encourage start-ups

In late 2012, Italy embarked upon reforms aimed at developing a fertile start-up ecosystem. The Italian Startup Act represents a package of tools affecting all stages of business life cycle, aimed at creating the enabling conditions needed for a quick go-to-market and scaling up. Innovative start-ups can profit from a vast array of benefits for five years, including:

- exemption from fees normally due to the Chamber of Commerce
- opportunity to remunerate workers and consultants through stock options and work for equity schemes that are tax-deductible
- opportunity to raise capital in exchange for shares through equity crowdfunding portals
- robust tax incentives by up to 27% on seed and early-stage investment amounting up to EUR 1.8 million (euros)
- streamlined, free-of-charge access to public guarantees by 80% on bank loans amounting up to EUR 2.5 million.

Recently, Italy has also launched the Italia Startup Visa programme, which enables citizens from outside the EU intending to establish a high-tech company in Italy to obtain an entrepreneurship visa within 30 days, following an online and streamlined procedure.

The Italian Startup Act is an ongoing process that also draws on the analysis and evaluation of its empirical impact through a structured monitoring system involving the National Statistics Institute. In recent years, the Italian innovation ecosystem has grown rapidly: to date it counts more than 3 600 highly innovative tech start-ups (with an average weekly increase of 40 start-ups) and involves more than 15 000 partners and employees (with 2 000 added in the last quarter of 2014).

Source: Information supplied by Government of Italy.

In a dynamic economy, the disproportionate contribution of young firms to job creation is a reflection of the “up or out” dynamics typical of this group of firms: they either go “up”, resulting in higher-than-average rates of post-entry growth, or they go “out” (exit the market). The co-existence of high rates of success (“up”) and failure (“out”) in economies can be seen in emerging OECD work, which finds that countries where fast-growing firms expanded the most (in terms of employment) are also the countries that experienced the greatest shrinking at the bottom of the employment growth distribution.

Policies that (unwittingly) constrain the growth of firms should be assessed with particular care. Examples include both “sticks” (i.e. regulations that affect only firms above a certain size) and “carrots” (i.e. support mechanisms for which only smaller firms are eligible).

4.6. Global value chains

Openness to international flows of capital, goods, people and knowledge has always been essential for innovation. Globalisation increases the size of markets available to innovators and consumers. Conversely, the involvement of firms in globalisation often requires sufficient scale to overcome the fixed costs of entry in foreign markets. Globalisation also facilitates specialisation, increases competition, and facilitates the spread of knowledge, technologies and new business practices. These dynamics positively affect innovation and long-term economic productivity.

A range of recent OECD work (e.g. OECD, 2013c, 2014f) has called attention to the spread of value chains, i.e. the full range of activities that firms engage in to bring a product to the market, including design, production, marketing, logistics and distribution. Such value chains have become increasingly global, leading to a growing interconnectedness of the world economy, but also to a growing specialisation of firms and countries in specific tasks and business functions. Today, most goods and a rising share of services might be described colloquially as “made in the world”.

The rise of GVCs underscores the importance of openness. Since imports are essential for exports, especially in complex value chains such as transport and electronics, tariffs and non-tariff barriers are effectively a tax on exports. Export restrictions, including in raw materials (OECD, 2014f), can also affect the efficient functioning of GVCs and raise costs. The negative effects of trade protection are compounded in GVCs when parts and components cross borders many times. By providing access to cheaper, more differentiated and better quality inputs, outsourcing and offshoring can also enhance export competitiveness in GVCs.

Strengthening the international competitiveness of firms in GVCs also requires strengthening factors of production that are “sticky” and unlikely to cross national borders. This implies investment in education, skills and high-quality infrastructure and the encouragement of strong industry-university linkages. The quality of institutions and government – and the overall business environment – are also important long-term factors in firms’ decisions to engage in economic activity in a given country. To strengthen the benefits that countries obtain from participating in GVCs, governments need to support the upgrading process by enabling investment in knowledge assets such as R&D and design.

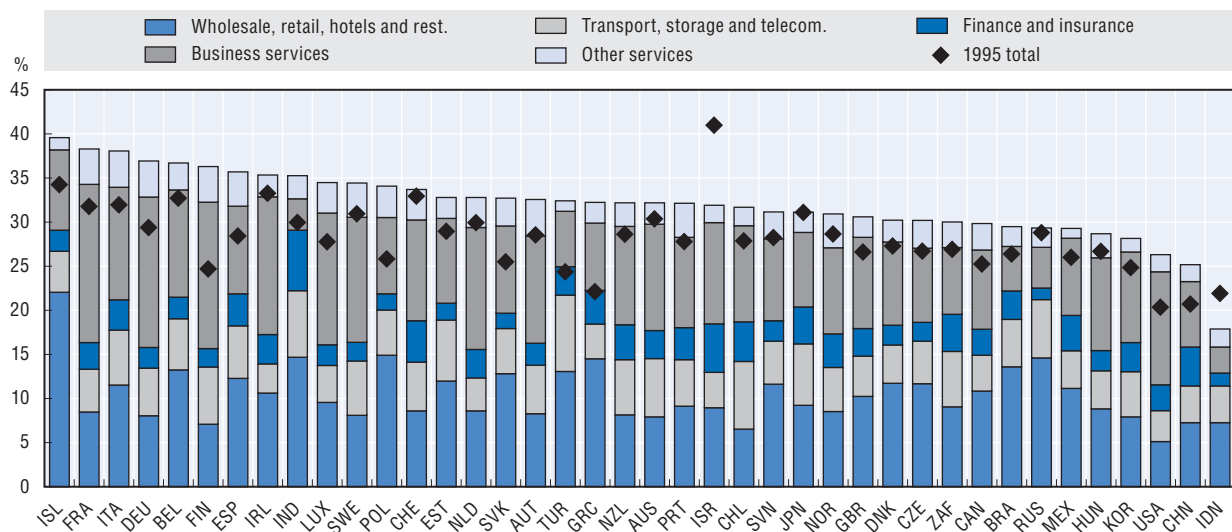
Trade-facilitating measures, such as fast and efficient port and customs procedures, permit the smooth operation of value chains that require goods to cross borders many times. The convergence of standards and certification requirements, and mutual recognition agreements, can also help alleviate burdens on exporting firms.

OECD analysis shows that services, e.g. business services, transport and logistics, account for over half of value creation in GVCs in many OECD countries, and over 30% in China (Figure 4.6). Global production networks crucially rely on well-functioning logistics, finance, insurance, communication and other business services. These services are necessary for the efficient transfer of goods, data, technology and know-how across borders, and the co-ordination of geographically dispersed activities.

Regulatory reforms and liberalisation of services trade are essential to enhance competition and increase the productivity and quality of services. Recent work on the OECD’s Services Trade Restrictiveness Index (STRI) shows that domestic and international competition in some service sectors is severely hampered by regulatory frictions and state intervention. While tariffs are generally smaller or non-existent for services trade, the scope of potential barriers to trade in services is broader than trade in goods. Services are

traded in a variety of modes, output is much more heterogeneous, and regulation (covering both domestic and cross-country transactions) is more complex. Some of the horizontal policies that restrict services trade include limitations on market entry (such as equity limits, licensing requirements or economic needs tests), restrictions to the movement of people, heterogeneous services standards, and competition regulation. Barriers may be discriminatory against foreign suppliers, but even when that is not the case, trade may be restricted through domestic regulation that prevents entry and competition. Much of this regulation is sector-specific. For instance, a wide range of rules in telecommunication services pertain to access and interconnection, number portability, local loop unbundling, and infrastructure sharing. These rules directly influence the decision of foreign providers to enter a given market.

Figure 4.6. **Services value added in manufacturing exports, OECD and BRICS countries, 2009**
(as a percentage of total gross manufacturing exports)



Note: BRICS countries = Brazil, Russian Federation, India, Indonesia, China and South Africa.

Source: OECD/WTO (2013), *Trade in Value Added (TiVA)* (database), <http://stats.oecd.org/>.

Large MNEs control and co-ordinate activities in GVCs. Policy affects how international networks of buyers and suppliers are formed and where their activities are located. Given the important role of MNEs, lowering investment barriers is an efficient way for a country to become integrated in GVCs.

Finally, since GVCs involve activities contracted within and between MNEs and independent suppliers, the ability to enforce contracts is crucial. Countries with sound legal systems tend to export more in more complex industries. Tasks that require more complex contracts (e.g. R&D, design, branding) are also more easily carried out in countries with well-functioning contractual institutions.

4.7. Investment and innovation

A final key policy area that is an important framework condition for innovation concerns investment. As noted already in the section on KBC, firms in many OECD countries now invest as much in KBC as they invest in tangible forms of capital such as machinery, equipment and buildings. The framework conditions for investment therefore have an important bearing on innovation.

The OECD's Policy Framework for Investment (PFI) provides a broad framework for investment policy based on a set of questions to policy makers (OECD, 2006). Three principles apply throughout the framework. The first is **policy coherence**, based on an integrated approach to the interaction between various policy areas and the investment environment. For example, standards for investment protection and openness are of wide applicability to international as well as domestic investors including SMEs; effective competition and tax policies are important to ensure that investment, in particular in small businesses, is not deterred by unnecessary barriers to entry, dissuasive taxation, and poor legal compliance; and open trade policies contribute to realising the benefits of an open investment policy. Chapter 8 discusses the conditions for a sound regulatory framework within and across policy domains.

The second principle is the importance of a **transparent approach** to policy formulation and implementation, with government agencies accountable for their activities. Transparency reduces uncertainty and risk for investors and the transaction costs associated with making an investment, and facilitates public-private dialogue. Accountability reassures investors that government agencies are exercising their powers responsibly. How transparency and accountability in specific public policy domains foster an environment where investment flourishes is a theme taken up in detail in the PFI.

The third principle that applies across the framework is **regular evaluation** of the impact of existing and proposed policies on the investment environment. In this regard, the questions in the PFI seek to help evaluate how well government policies uphold established good practices in terms of fair treatment for all investors (foreign or domestic based, small or large in size) and opening opportunities to invest, taking into account the wider interests of the community in which investors operate. The questions attach a particular emphasis to the adaptability of the institutional framework and the role of periodic evaluations so as to identify early on new challenges and to be able to respond quickly to them.

While innovation is not explicitly included in the framework, many of the issues included have a bearing on innovation. IPRs protection is a key aspect of innovation on which the framework provides guidance for policy makers. IPRs give businesses an incentive to invest in R&D, fostering the creation of innovative products and processes (see also Chapter 5). They also give their holders the confidence to share new technologies, e.g. through joint ventures and licensing agreements. In this way, successful innovations are in time diffused within and across economies, contributing to higher productivity and growth.

The protection granted to IPRs needs to strike a balance between incentivising innovation and ensuring competitive markets, with new products priced affordably. The whole-of-government approach and policy coherence promoted by the framework can provide guidance on finding and maintaining this balance. The PFI is currently being updated to reflect new insights and policy needs as regards the enabling environment for investment.

4.8. Main policy learnings on the framework conditions for innovation

The main policy learnings from recent OECD work on the framework conditions for innovation are included below. One other element must be noted. The OECD provides many indicators that enable countries to compare and evaluate their performance on a wide set of framework conditions, including labour markets, product markets and financial markets, as well as in international trade and investment. Many of these indicators are published in the OECD's *Going for Growth* and other flagship reports. New indicators have emerged recently or are currently under development, including: indicators on specific aspects of KBC, including intellectual property; indicators on firm dynamics; and indicators on GVC, such as the *Trade*

in *Value Added (TiVA)* database and the STRI. Further work on measurement and indicators can help to better compare and benchmark performance, and can also provide the basis for economic analysis and the impact assessment of specific policies.

Main policy messages related to the framework conditions for innovation

- **Knowledge-based capital:** As overall business investment in KBC increases – and because of KBC’s particular economic features, especially its intangible nature – certain key policy settings need to be updated. Ensuring that policies conform to good practice is essential in the fields of taxation, entrepreneurship, competition, corporate reporting, intellectual property and policies that enable the exploitation of data as an economic asset.
- **Financing of innovation:** Access to external financing is especially important when innovative firms, particularly young firms, begin to grow. The range of financing instruments available to the business sector needs to be broadened. Strengthening seed and early-stage equity finance, including VC and angel investment, can boost the creation and development of innovative ventures. And other mechanisms in the capital market, such as public listings for SMEs, can provide financial resources for established growth-oriented firms. Along with efforts to boost the supply side of the equity market, demand-side initiatives – improving investment readiness – should also receive policy attention. Challenges exist to increase innovative firms’ uptake of alternative investment instruments. These challenges can be met by improving finance-related skills in new and small firms, designing regulations that balance financial stability with the opening of new financing channels for entrepreneurs, and developing infrastructures to reduce information asymmetries and encourage investor participation. A further challenge is to implement policies that lever private resources and help to share risk with the private sector (such as through co-investment schemes for financing seed and early-stage ventures).
- **Global value chains:** An extremely broad array of policies and institutional conditions shape a country’s role in any given GVC. Competitiveness in GVCs requires strengthening factors of production that are unlikely to cross national borders. This implies investment in education, skills and high-quality infrastructure and the encouragement of strong industry-university linkages. The negative effects of trade protection are compounded in GVCs, and trade-facilitating measures should be implemented where necessary. Convergence of standards and certification requirements, and mutual recognition agreements, can help alleviate burdens on exporting firms. Regulatory conditions that hinder domestic and international competition in services should be reviewed. Horizontal policies that restrict services trade should be reformed, as should unnecessary impediments to cross-border investment. The ability to enforce contracts is crucial. Consequently, sound legal systems and well-functioning contractual institutions must be developed and/or maintained.
- **Entrepreneurship and experimentation:** A number of policy recommendations can be drawn from this work:
 - ❖ *Policy must provide incentives to ensure that dynamic reallocation occurs on a continuous basis.* Policy settings that affect firm entry and exit, and the growth of young firms, will affect the extent to which resources are allocated to more productive firms.
 - ❖ *Policies that (unwittingly) constrain the growth of firms should be assessed with care.* Examples include both “sticks” (i.e. regulations that affect only firms above a certain size) and “carrots” (i.e. support mechanisms for which only smaller firms are eligible). Conversely, subsidies to incumbents and other policies that delay the exit of less-productive firms might stifle competition and hinder efficient resource allocation.
 - ❖ *Significant benefits can arise from increased access to seed and early-stage financing, as well as from increased efficiency in the judicial system.* Benefits also arise from reforming PMRs that inhibit competition, as well as reducing policy-induced barriers to exit (e.g. excessively strict bankruptcy codes).
 - ❖ *In framing employment protection legislation, the implications for innovation should be taken into account.*
- **Investment:** Policy coherence, transparency and regular evaluation are important characteristics of investment policies that help provide a sound framework for business investment in innovation and KBC.

Notes

1. It is also important to note that firms' initial investments in KBC will likely be shaped by their perceptions of the expected costs of implementing and commercialising new ideas and the ability to capitalise on the expected benefits or to exit at low cost (which will both depend on the ease of reallocation). In particular, firms' innovation strategies will be influenced by their perceptions regarding the extent of rigidities in the reallocation process. If the costs of reallocation are deemed to be high, entrepreneurs may focus on incremental innovations, rather than experiment with disruptive technologies, because it will be more difficult to realise the benefits of risky technologies when successful and contain losses when unsuccessful (Bartelsman, 2004; Andrews and Criscuolo, 2013).
2. See discussion and indicators of bankruptcy legislation included in the OECD's Innovation Policy Platform (<https://innovationpolicyplatform.org/content/bankruptcy-regulation>).

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