

## Chapter 2

### **Economic performance and framework conditions for innovation in the Netherlands**

*This chapter discusses the Netherlands' macroeconomic performance. It presents salient features of the Dutch economy – openness to international trade, the important role of services – and sketches out patterns of structural change in production and trade. It also looks at the current state of framework conditions as they relate to entrepreneurship and innovation. It concludes with a brief discussion of the role of innovation in the country's longer-term economic development.*

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

On many accounts, the Netherlands is among Europe’s most advanced economies. It is a founding Member of the European Union and is also part of the European Economic and Monetary Union (euro zone). The Netherlands looks back to a rich intellectual and economic history (Box 2.1).

## 2.1. Macroeconomic performance and productivity growth

Macroeconomic conditions are both a result and a determinant of innovation. On the one hand, a successful innovation system contributes to the efficient utilisation of resources, thereby raising productivity and promoting growth. More importantly, innovation can be viewed as the primary source of long-term growth in per capita income. On the other hand, a favourable environment, with strong and stable macroeconomic conditions, a healthy financial system and other positive features facilitates innovation and helps its diffusion across the economy.

### Box 2.1. Aspects of the Netherlands’ economic history

History, cultural and institutional characteristics, and geographical features have shaped the evolution of the Dutch economy, society and innovation system. A country with a population of 16.8 million (2013), which inhabits hardly more than 40 000 square kilometres, partly gained from the sea through continuous efforts, it is path-breaking in many ways. Dutch cities were early centres of European enlightenment and learning and contributed significantly to the advancement of knowledge and to economic, social and institutional innovations. Reflecting on its numerous achievements, including in finance, patenting, etc., eminent economic historians have called the Netherlands “the first modern economy” (de Vries and van der Woude, 1997).

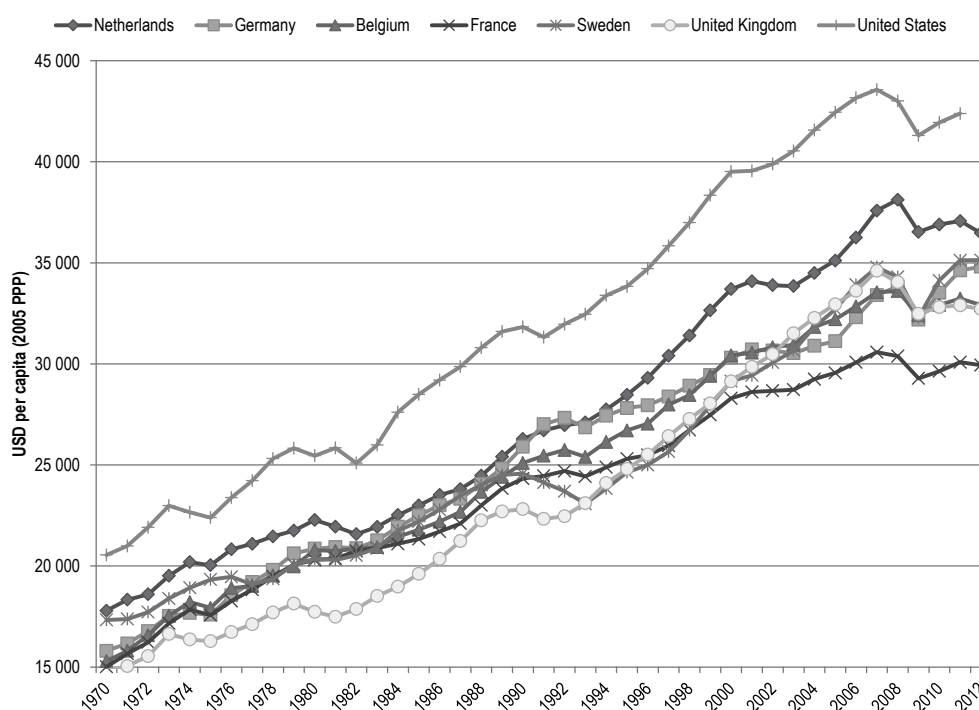
The Dutch economy has benefited greatly from globalisation, through international trade and investment, access to overseas markets, immigration, and the free exchange of knowledge. The achievements of the “golden age” of the Dutch republic of the 17<sup>th</sup> century created a strong science, technology and engineering base. For various reasons, the Netherlands dropped behind the world technological frontier around the time when England’s Industrial Revolution was taking off (Mokyr, 2000). While it was not part of the first cohort of continental European countries to embark on the Industrial Revolution, the Dutch economy modernised in the latter part of the 19<sup>th</sup> century, laying the ground for many important industrial ventures that would eventually become large multinational enterprises with important implications for the future (Van Zanden, 1998).

### *Macroeconomic developments*

In a long-term perspective, the Dutch economy has had comparatively high growth. The Netherlands’ economic development after the Second World War was characterised by a period of high growth and catch-up with US income levels that lasted until the mid-1970s. Its economic expansion has not always been smooth, however. While GDP per capita was well ahead of that of European comparator countries in 1970 (Figure 2.1), its lead narrowed over time. A mismatch between productivity and wage increases started to appear in the 1970s, the effects of which came to be referred to as the “Dutch disease” and were exacerbated by the oil crises of 1973 and 1979. The situation was due in part to the negative side effects of the successful development of the gas sector, as real wage appreciation led to an erosion of competitiveness in other tradables.

**Figure 2.1. Long-term economic performance**

GDP per capita in USD (PPP) for selected OECD countries, 1970-2012



Note: GDP per capita at constant prices, constant US PPPs.

Source: OECD (2013), *National Accounts Statistics*, [www.oecd.org/std/na/](http://www.oecd.org/std/na/), August.

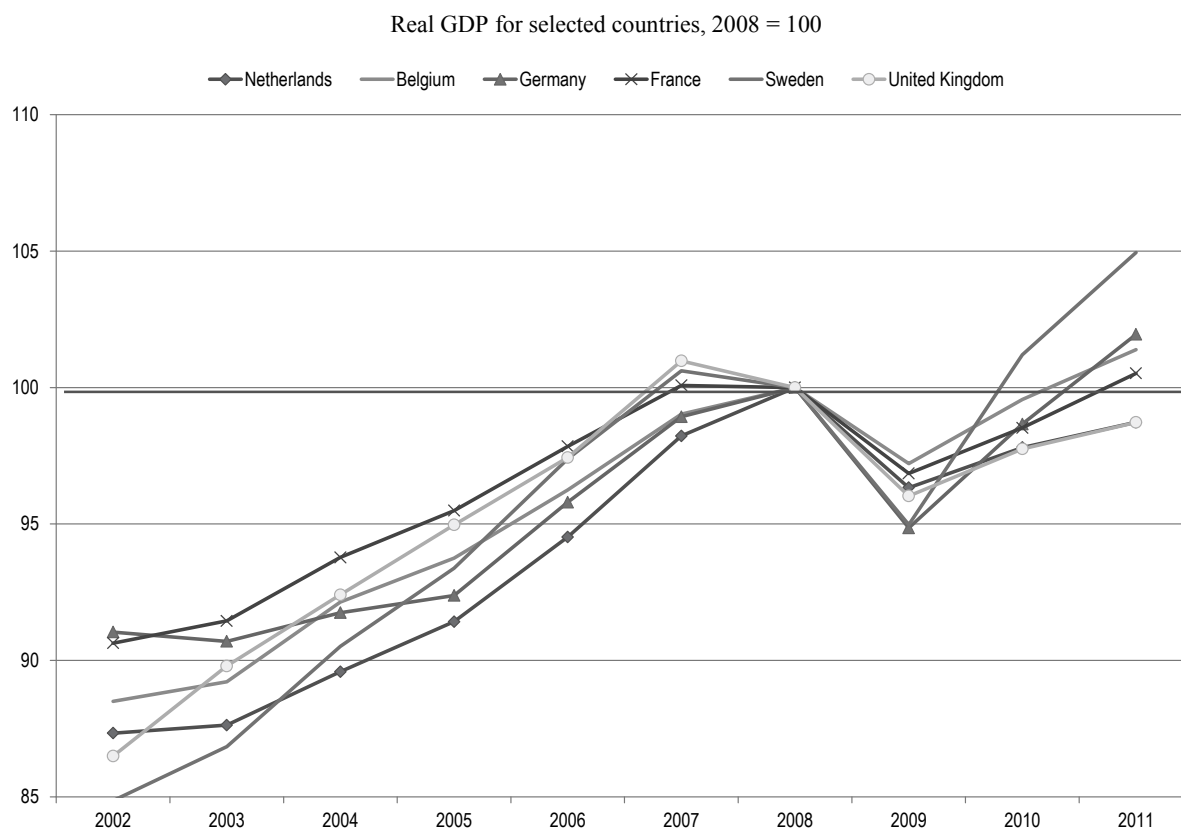
In response to this situation, the well-known Wassenaar Agreement – concluded in 1982 between business and labour unions, and later endorsed by the government – included a combination of cost cutting and institutional reforms, as well as incentives. The trade unions promised wage moderation and accepted more decentralised wage bargaining in exchange for a stronger emphasis on job creation. The government promised fiscal consolidation and lower taxes. As a result, real wages declined and increases in unit labour costs remained below the EU15 average. An increased role for the services sector (Wijnbergen, 1984; Corden and Neary, 1982) and diversification of exports also helped. The Dutch economy and productivity then rebounded and achieved rapid growth. During difficult times, the Netherlands proved to be resilient, owing to the population’s willingness to take a pragmatic and consensual approach to confronting and adapting to changes in the economic environment and to related social, technological and economic challenges. The so-called “polder model” provided the institutional framework for much of the Netherlands’ growth.

Subsequently, and although the country lost some ground, it managed once more to stay roughly on par with the United States in the 1990s, a significant achievement given the dynamism of the US economy during that period. The 1980s and 1990s were known in fact as the “Dutch miracle” (OECD, 2006). The international downturn at the beginning of the 2000s again affected the Netherlands, and in 2003 the Dutch economy was in recession. This was at least partly attributed to a deterioration in the competitive position of the Dutch economy (see the discussion of productivity and unit labour costs below).

Growth picked up again in the years preceding the 2008-09 crisis, and the Netherlands grew faster than many comparators. The crisis hit in 2009, leading to a pronounced downturn that was, however, less sharp than in other countries. Yet the Netherlands did not rebound as quickly as other countries in northern and central Europe, and the economy double-dipped in 2012 (Figure 2.2). In contrast to Austria, Germany, Sweden and Switzerland, Dutch economic activity has not reached pre-crisis levels, and real GDP is 4% below its peak in the first quarter of 2008 (OECD, 2014).

The Netherlands is now gradually emerging from a protracted recession. Growth is improving but remains weak as deleveraging continues, resulting in low consumer spending and weak lending to the corporate sector (OECD, 2014). An important impediment to a swift recovery has been the situation of banks and their diminished role in funding small-scale and risky projects. Moreover, signals about the capacity of the venture capital market to provide adequate financing to innovative businesses are mixed. These factors weigh on (short-term) growth prospects (OECD, 2014). To the extent that recent and ongoing fiscal consolidation affects resources devoted to education, research and innovation more broadly, it might also affect future innovation outcomes and weaken growth in the medium to long term.

**Figure 2.2. Dutch economic performance before and after the crisis**



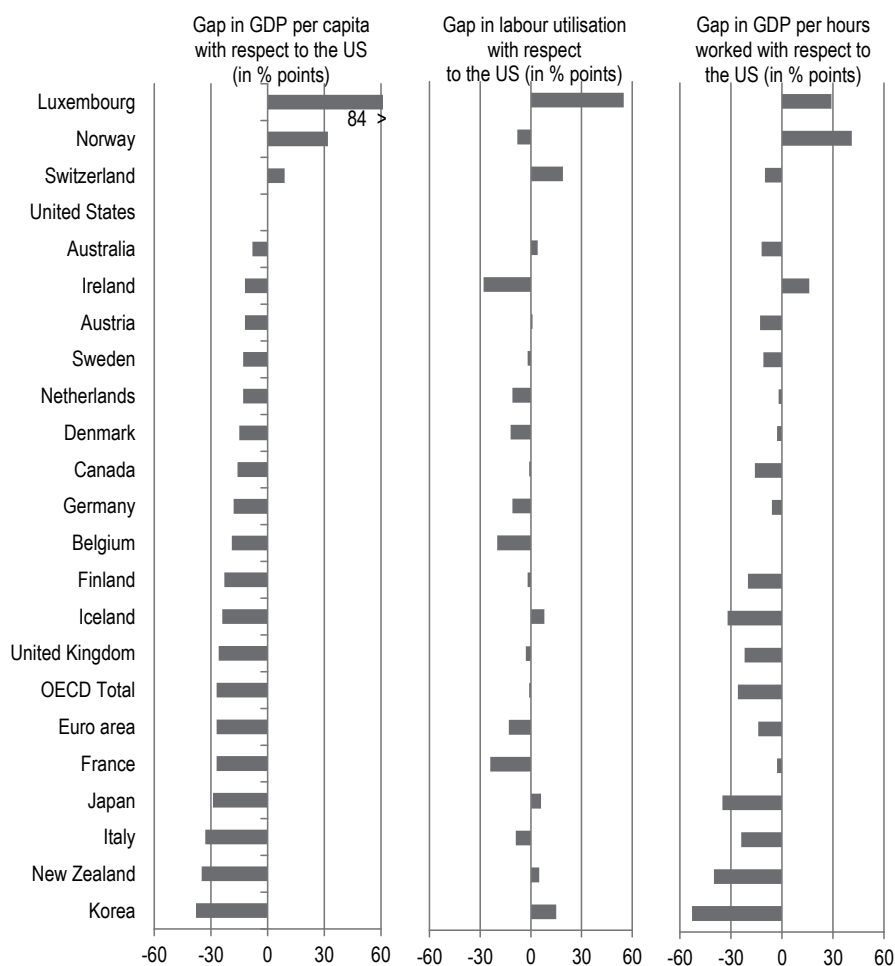
Note: Real GDP at constant prices, 2008 = 100.

Source: OECD (2013), *National Accounts Statistics*, [www.oecd.org/std/na/](http://www.oecd.org/std/na/), August.

Despite the weak rebound after the crisis, the Netherlands ranks ninth among OECD countries in terms of income per head, with a gap of 13% *vis-à-vis* the United States (Figure 2.3). Other OECD countries, notably small European ones, have similar levels of income per capita. Labour productivity – measured as GDP per hour worked – is just 2% below the level of the United States. Instead, the gap in GDP per capita is largely accounted for by labour utilisation – defined as the number of hours worked per working age population – which lags the United States by 11% despite high labour market participation (Gerritsen and Høj, 2013a and 2013b) and a relatively low, albeit rising, unemployment rate. The main contributing factors are the prevalence of part-time work, an early effective retirement age and a still high numbers of disability recipients, despite marked improvements (OECD, 2008; Sonsbeek and Gradus, 2013).

**Figure 2.3. Income per capita and productivity**

Income, labour utilisation and productivity levels relative to the United States for selected OECD countries, 2012



*Note:* Labour productivity and income levels are calculated using GDP at current prices and converted to US dollars using 2012 purchasing power parities. Labour utilisation is measured as total hours worked per capita. The euro area includes Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, the Slovak Republic, Slovenia and Spain. France includes overseas departments.

*Source:* OECD (2013), *OECD Productivity Database*, [www.oecd.org/statistics/productivity](http://www.oecd.org/statistics/productivity), August.

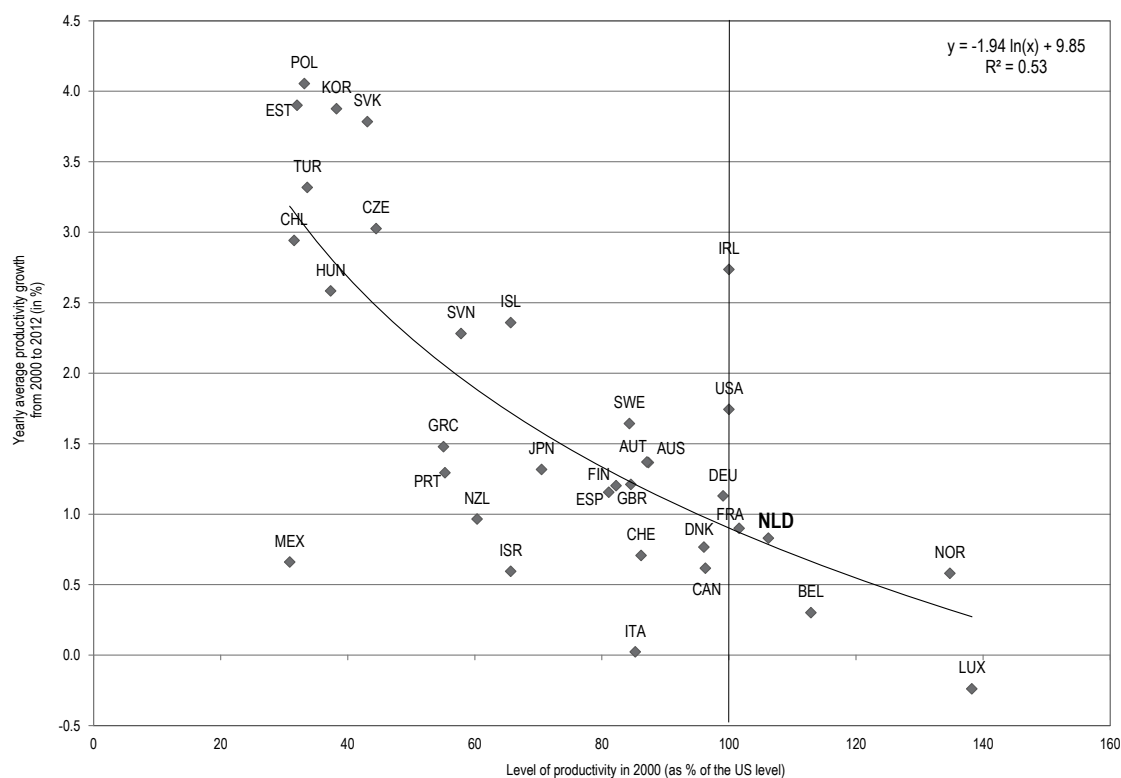
## Productivity growth

Productivity is a main driver of economic development in the long term and the major source of differences among countries in terms of GDP per capita (OECD, 2013a; Figure 2.3). As labour market participation has a natural limit, higher labour productivity is the only source of sustained economic growth. This is especially relevant for developed countries such as the Netherlands, where demographic changes are expected to constrain labour market participation in the years to come. Labour productivity, in turn, is driven by capital intensity and multifactor productivity (MFP), i.e. the joint efficiency of the production inputs, labour and capital.<sup>1</sup> The broad picture emerging from the empirical literature is that it is MFP and not capital intensity that is more important for shaping countries' differences in income (Hall and Jones, 1999; for recent empirical work, see Inklaar and Timmer, 2009, and Johansson et al., 2013).

For the most developed countries, technological advances that push the technological frontier drive productivity growth. Countries further behind the frontier can realise immediate gains by adopting or imitating existing technologies (catch-up) if they have the absorptive capacity necessary to reap the “advantages of backwardness”. Productivity growth is therefore likely to be slower for already highly efficient economies.<sup>2</sup> Through the 2000s, the Netherlands performed about as well as its high productivity level in 2000 would suggest (Figure 2.4).<sup>3</sup> Some comparator countries performed better than what would have been expected from their level of productivity.

**Figure 2.4. Productivity levels and growth**

Labour productivity levels (2000) and growth rates (2000-12) across OECD countries



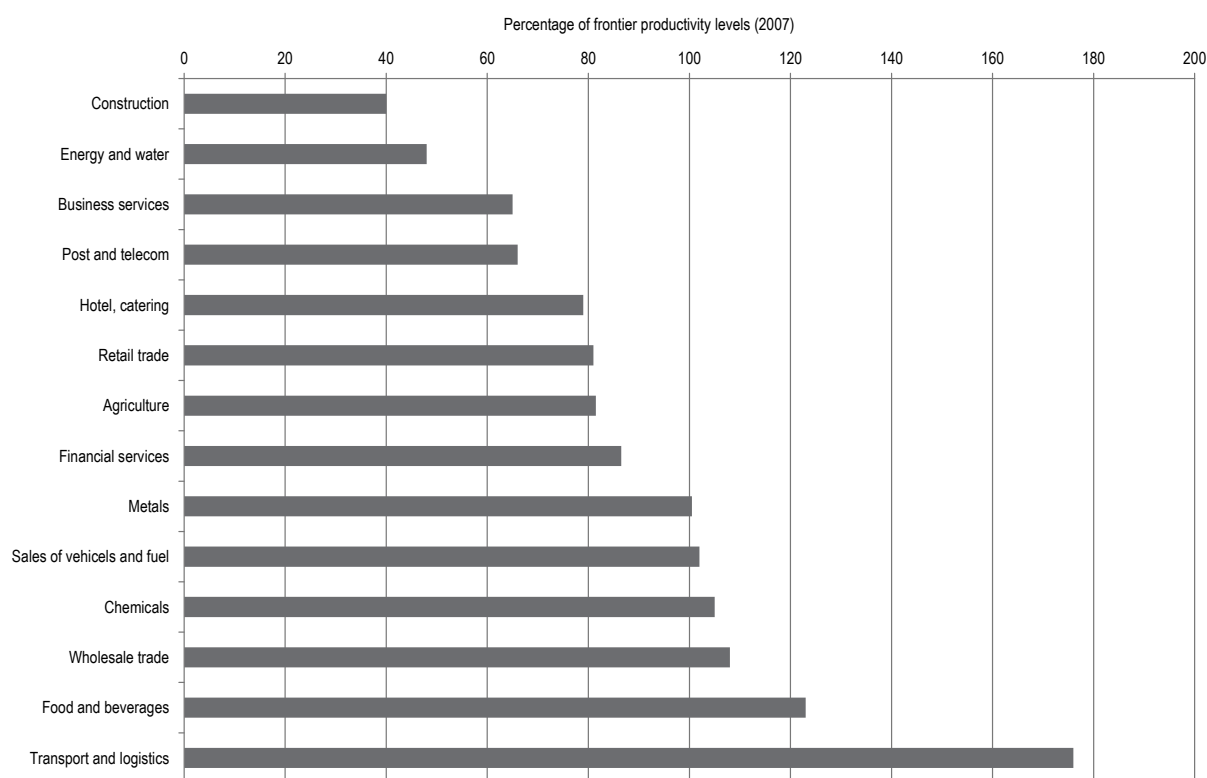
*Note:* Labour productivity is measured as GDP per hours worked, in USD, converted using PPPs.

*Source:* OECD (2013), *OECD Productivity Database*, [www.oecd.org/statistics/productivity](http://www.oecd.org/statistics/productivity).

Contributions to the Netherlands' high productivity level vary across sectors and industries.<sup>4</sup> Transport, logistics and wholesale trade in the services sector and the food, chemicals and metals industries in the manufacturing sector stand out as being close to or at the global frontier (Figure 2.5). However, construction, the energy sector and, more importantly, the relatively large business services sectors still have a way to go to reach international best practices (Van de Ven, 2013). Challenges for the medium to long run include boosting productivity growth in laggard sectors, such as business services, telecommunications and construction, and keeping the best-performing sectors (transport, logistics, wholesale, food and chemical industries) at the international frontier through continuous innovation.

**Figure 2.5. Productivity gaps across industries**

Labour productivity levels by industry expressed as a percentage of the frontier, 2007



*Note:* The global frontier is defined, separately for each industry, as the average of the three best-performing countries in 12 European countries (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Spain, Sweden, United Kingdom). Small industries representing less than 1.5% of total value added are excluded.

*Source:* OECD calculations following the methodology in Van de Ven (2013) using EU-KLEMS data (O'Mahony and Timmer, 2009) and detailed industry-level value added PPPs (Inklaar and Timmer, 2008).

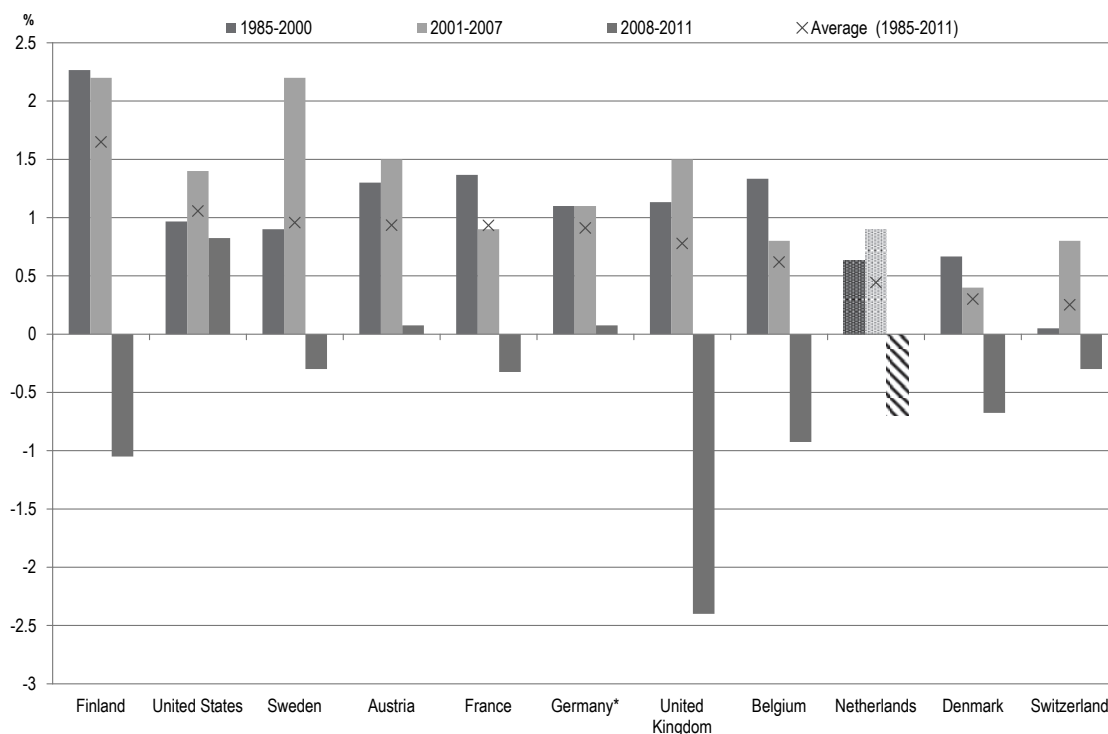
High-performing transport and distribution activities are important in their own right. By reducing transport costs and delivery times, they are also the source of spillovers to many other parts of the economy. The outstanding performance of industries participating in foreign trade and logistics is critical for maintaining the Netherlands' position as a major logistic hub in Europe and reaping the benefits of its geographical location. Cross-country studies highlight the importance of a favourable geographical position for a high

overall level of productivity. Boulhol and de Serres (2010) conclude that the benefits of a favourable location may be as high as 6% of GDP for Belgium and the Netherlands. Moreover, there is ample evidence of the importance of distance for trade and flows of foreign direct investment (FDI) (e.g. Nicoletti et al., 2003). Trade and FDI are also important channels for knowledge and technology spillovers (Eaton and Kortum, 1996; Keller, 2002).

While Dutch productivity levels are high overall, the country's MFP may raise the issue of their sustainability. MFP growth in the Netherlands has been one of the lowest among selected OECD countries in the last 25 years (Figure 2.6). The United States, Germany and Sweden have achieved higher MFP growth despite already very high levels of productivity, while Finland and Austria have caught up to the international frontier during the last decades. Only Denmark and Switzerland had lower rates of MFP growth than the Netherlands, and the MFP slowdown in the Netherlands since the beginning of the financial and economic crisis has been one of the sharpest among comparator countries.

**Figure 2.6. Multifactor productivity growth**

By country, average growth rates over selected time periods



Notes: \*For Germany, data available only from 1995.

Source: OECD (2013), *OECD Productivity Statistics* (database), [www.oecd.org/statistics/productivity](http://www.oecd.org/statistics/productivity) (October 2013).

Using a somewhat different methodology to calculate MFP growth, van Ark et al. (2013)<sup>5</sup> also find a slowdown during the 2000s. Indeed MFP has slowed down in advanced economies throughout Europe as well as in the United States (Fabina and Wright, 2013). The slowdown in most countries, including the Netherlands, is partly explained by the on-going structural shift towards services, which are usually less productive and improve more slowly. In addition, productivity growth in services has



slowed as well and was a major factor in the aggregate slowdown.<sup>6</sup> Furthermore, OECD calculations show that MFP growth in manufacturing was lower in the Netherlands than in peer countries during 1995-2000 and 2000-08 (Table 2.1) and slowed between the two periods (i.e. before the onset of the crisis). In line with the findings of van Ark et al. (2013), there has also been a slowdown in trade and hotels, which has occurred in comparator countries as well. Exceptions are construction and agriculture, relatively small sectors, as well as business services, in which the Netherlands has shown accelerating MFP growth, despite a slowdown in other countries.<sup>7</sup>

**Table 2.1. Multifactor productivity growth by sectors**

<b>2000-2008</b>	<b>Agriculture</b>	<b>Manufacturing</b>	<b>Construction</b>	<b>Trade and hotels</b>	<b>Business services</b>
Netherlands	1.7%	2.5%	0.5%	2.3%	0.7%
Average of selected OECD countries	2.2%	3.1%	-1.1%	1.8%	1.3%
<b>1995-2000</b>	<b>Agriculture</b>	<b>Manufacturing</b>	<b>Construction</b>	<b>Trade and hotels</b>	<b>Business services</b>
Netherlands	-1.0%	3.2%	-0.6%	4.5%	0.0%
Average of selected OECD countries	3.4%	4.0%	-0.1%	2.2%	2.6%

Selected OECD countries are: Austria, Belgium, Denmark, Finland, France, Germany, Norway, Sweden, United Kingdom, United States.

Source: OECD “Productivity by industry”, *OECD Productivity Statistics* (database), doi: [10.1787/data-00627-en](https://doi.org/10.1787/data-00627-en).

Slow productivity growth combined with disproportionately strong increases in labour costs raises unit labour costs (OECD, 2012). Over the two decades from 1991, unit labour costs in the Netherlands increased faster than in comparator countries such as Germany, Austria, Sweden and France. This tends to erode competitiveness and prevent better export performance. Slow productivity growth may also lead to a decline in GDP per capita in the medium to long term if productivity improvements do not compensate for a shrinking labour force that results from demographic change.<sup>8</sup>

There is an on-going debate among economists about the medium- and long-term outlook for productivity in advanced economies. Some argue that recent advances in information and communication technology (ICT) and their on-going diffusion are not enough to reverse slowing productivity (Fernald, 2012; Gordon, 2013). Others foresee tremendous increases in productivity as the use of sophisticated IT and robotic tools automate more and more tasks (e.g. big data, 3D printing). Others see emerging fields such as nanotechnology and biotechnology laying the ground for lifting productivity in services, particularly health care, as well (Bartelsman, 2013; Byrne et al., 2013; Brynjolfsson and McAfee, 2014). In any of these scenarios, the Netherlands, as a country that operates close to or at the technological frontier, will have to pay close attention to its innovation capabilities and performance.

## 2.2. Globalisation and structural change

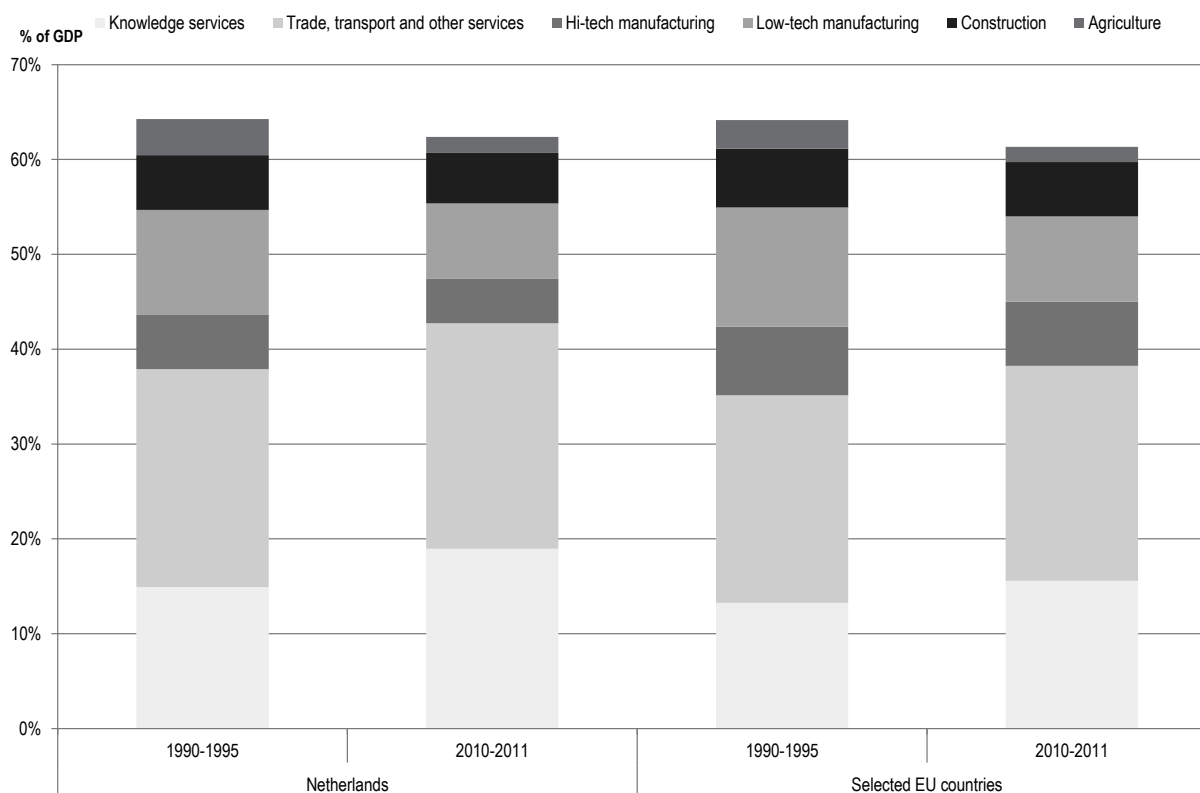
### *Structural change in production*

The Netherlands has traditional strengths in the services sector in trade, transport and logistics owing in part to its geographical position – the Meuse and the Rhine rivers, good access to Germany – as well as financial and business services. These strengths can be traced back to Dutch cities’ early specialisation in trade and finance but they have, of

course, evolved as a result of the institutional and technological changes that have underpinned globalisation, especially in transport and ICT.

Knowledge-intensive services play a strong role and have grown from 1990 to 2011 (Figure 2.7). In terms of value added, they accounted for 19% of the Dutch economy in 2011, 3% more than the average of comparator EU countries. Strengths in a number of industries notwithstanding, the manufacturing sector is relatively small and has declined over the last two decades to 13% of aggregate value added, against 16% in peers. The decline in the weight of the manufacturing sector in aggregate economic activity is a trend shared by other OECD economies, but it has been more pronounced in the Netherlands.<sup>9</sup> Moreover, both the low-technology and high-technology segments of manufacturing have shrunk, while there was almost no decline in the latter's share in comparator countries. These countries maintain a larger share of high-technology manufacturing industries. The traditionally important Dutch agricultural sector has seen its value-added share falling over time, as in other advanced EU countries. Finally, the role of the construction sector has remained roughly the same over time and is comparable to peer countries.

**Figure 2.7. The share of major business sectors' value added in total GDP**



*Note:* High-technology, low-technology and knowledge-intensity classifications are from Eurostat and based on R&D spending intensity at the 2- or 3-digit industry level. The public sector is excluded, along with some very small sectors (mining and quarrying; water and electricity) and the real estate sector. Selected EU countries include Austria, Belgium, Denmark, Finland, France, Germany, Italy, Sweden.

*Source:* OECD Structural Analysis (STAN) Database, ISIC Rev 4, [www.oecd.org/sti/stan](http://www.oecd.org/sti/stan).

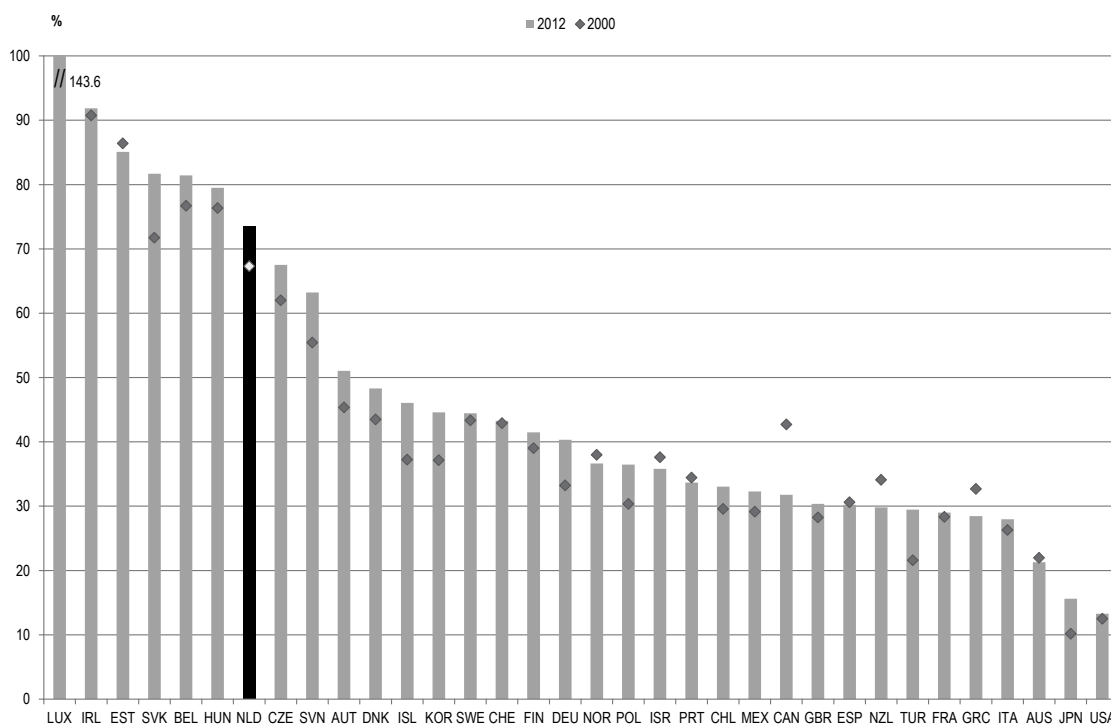
### *International openness: trade, global value chains and foreign direct investment*

In addition to general macroeconomic conditions, openness to trade and integration into capital and goods markets are essential to an innovation-friendly environment. Trade openness may lead to scale economies by providing more opportunities for growth and may encourage innovation through stronger competition, while cross-border investments may transfer knowledge abroad and contribute to the spread of innovative practices (Box, 2009). In a small open economy in particular, foreign trade and FDI flows are of critical importance for economic growth and development (Keller, 2002). Historically, the Dutch economy owes much to its international openness. The Netherlands has derived much of its wealth from gains in trade and other international transactions. Over the centuries, its economic activity has gone beyond the confines of a relatively small domestic economy to access overseas markets. The Netherlands is one of the most open OECD economies – in fact it has become even more open in the 2000s (Figure 2.8) – and is tightly integrated into the global economy through trade and foreign investment flows. It also plays a key role as a logistics hub.

Openness to international trade (measured as the average of imports and exports of goods and services over GDP) is one of the highest among OECD countries, trailing only Luxembourg, Ireland and Belgium among EU comparator countries (Figure 2.8). Moreover, its openness increased in the last decade from 67% to 73% of GDP despite a substantial dip during the first year of the financial and economic crisis (OECD, 2012).

**Figure 2.8. Openness to international trade**

The average of imports and exports over GDP



*Note:* Includes goods as well as services trade.

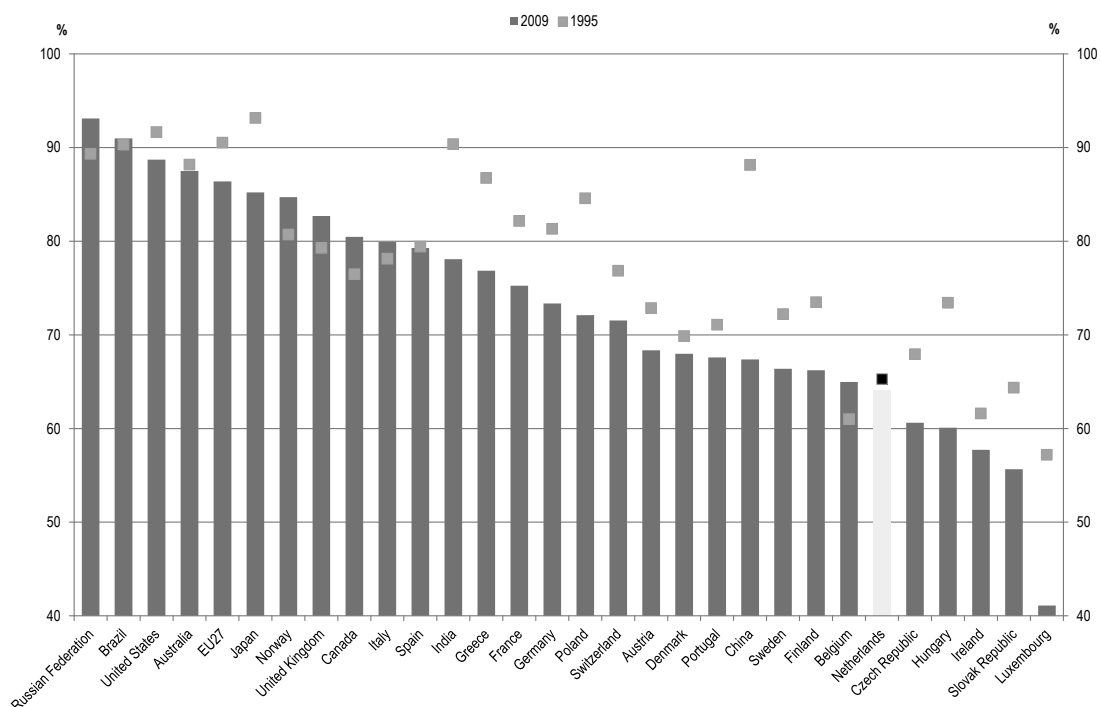
*Source:* OECD, International Trade statistics.

Dutch exports have grown rapidly in recent decades as world trade as well as intra-EU trade have expanded. The Netherlands is the second largest exporter among EU countries in gross terms, and recent data on trade in value added also indicate a very high degree of openness. Indeed, the export market performance of the Netherlands has been strong by international comparison. Unlike other OECD countries, the Netherlands has increased its export market shares over the past decades. However, this is largely due to the increasing re-exports of goods<sup>10</sup> – about 43% of total exports in 2012 (Statistics Netherlands, 2013) – with little domestic value added compared to domestically produced goods. Re-exports account for about half of exports to Germany, the Netherlands' main trade partner. Most exports are accounted for by a small number of large firms, as in other small open economies with large domestic enterprises (Statistics Netherlands, 2011).<sup>11</sup>

As in most other countries, the Netherlands' high degree of openness is primarily due to trade in goods rather than in services. Direct trade in services amounts to only 11% of GDP. Trade in services has increased along with exports of goods, and the contribution of services to domestic value added contained in exports has increased more than proportionately. When the indirect role of services as intermediaries in the production of export goods is also taken into account, their share doubles to 22% of GDP. The role of trade-facilitating services such as transport and wholesale and other knowledge-intensive services is very important and is reflected in a very high share of these services in total value added.

Integration into the global economy is taking place increasingly through global value chains (GVCs). Recent OECD work (De Backer and Yamano, 2012; OECD, 2013c) provides a basis for characterising a country's trade integration not only through the traditional industry dimension but also in terms of specialisation within GVCs. Trade in value added (TiVA) statistics indicate that the Netherlands, like Belgium, relies heavily on imported intermediaries and that the domestic value-added content of exports is relatively small. The share of domestic value added (which comprises direct and indirect exports) in gross exports is one of the lowest among OECD countries (64% according to the latest available data, for 2009) (see Figure 1.9). As a percentage of GDP, however, domestic value added embodied in foreign final demand (28%) is in the same range as in Sweden, Austria and Denmark.

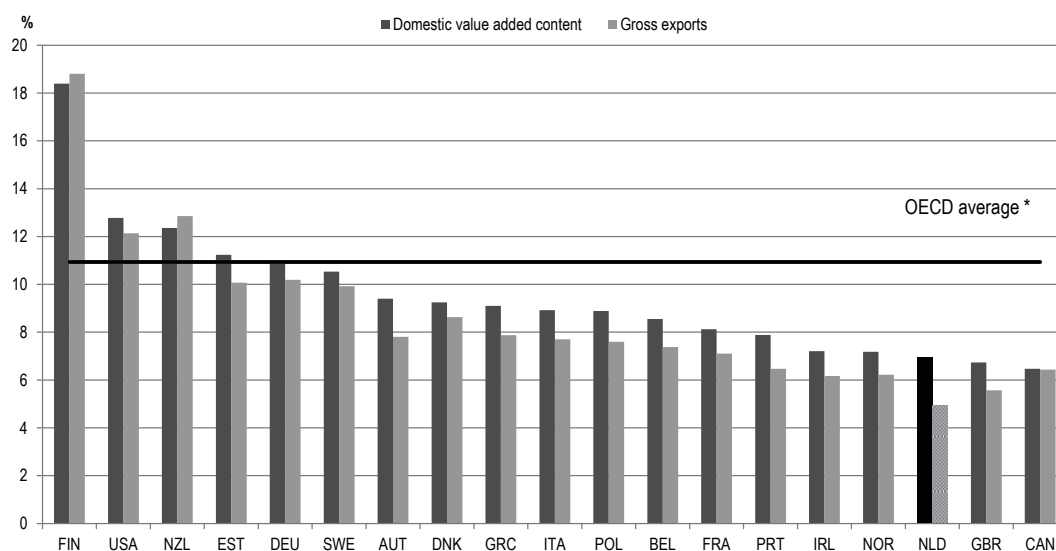
Even though international trade flows continue to expand, links with dynamic emerging markets are relatively weak (OECD, 2012). Only about 5% of gross exports go to the BRICs (Brazil, the Russian Federation, India and the People's Republic of China), whereas e.g. around 10% of Germany's or Sweden's gross exports go to these countries (Figure 1.10). In terms of domestic value added content, the Netherlands share of exports to BRICs is higher than in terms of gross exports. This reflects indirect exports from the Netherlands to emerging economies through integration in value chains (e.g. intermediate inputs supplied to German assemblers which export to BRIC countries). However, the overall pattern remains that for the Netherlands the share of exports to the BRICs is lower than for European peer countries (with the exception of the United Kingdom). As a result, it may be difficult for trade expansion to drive future growth, as the traditional Dutch export markets are likely to continue to lose weight in overall world demand (Hausmann and Hidalgo, 2013). Future success in the BRICs will depend among other on the qualitative characteristics of the Dutch bundle of exports. The increase in unit labour costs has also exerted downward pressure on international competitiveness, as it has been, over the longer term, stronger than in other OECD countries.

**Figure 2.9. Domestic value added as a % of gross exports, 2005 and 2009**

Source: OECD/WTO TiVA Database (2013), *OECD-WTO: Statistics on Trade in Value Added*, (database), doi: [10.1787/data-00648-en](https://doi.org/10.1787/data-00648-en).

**Figure 2.10. Exports to emerging markets, 2009**

Gross exports and domestic value added content of exports to the BRICs as a share of total exports

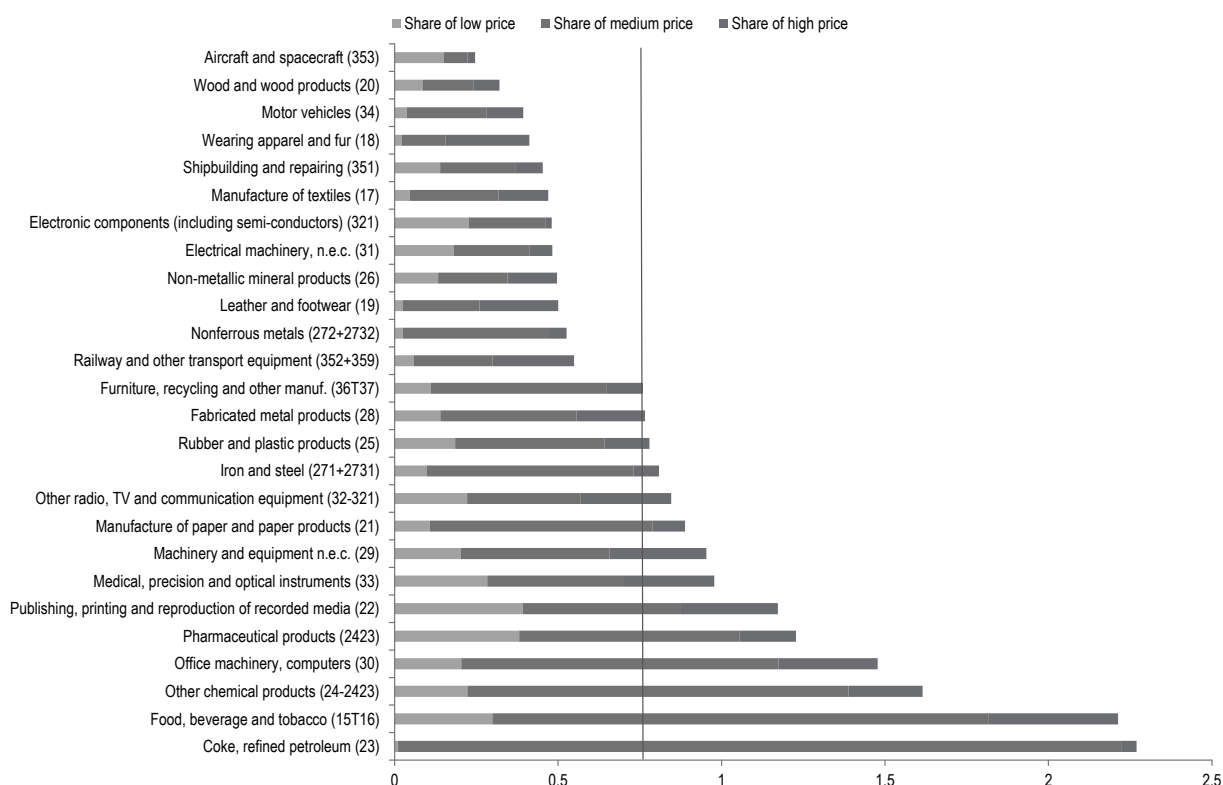


Note: Total exports of goods and services to BRICs as a percentage of total goods and services exports, in gross terms and in terms of domestic value added embodied in foreign final demand. BRICs: Brazil, Russian Federation, India and China.

Source: OECD/WTO TiVA Database (2013), *OECD-WTO: Statistics on Trade in Value Added*, (database), doi: [10.1787/data-00648-en](https://doi.org/10.1787/data-00648-en).

The most successful industries in terms of export specialisation are food and beverages, chemical products, coke and refined petroleum, and office machinery, as shown by measures of revealed comparative advantage (RCA) (Figure 1.11).<sup>12</sup> Composition by price segments can serve as an indicator of the quality of traded goods (for a definition of the low (high) price segment see the note to Figure 1.11) although re-exports limit their use as a tool to characterise the sophistication of domestic economic activities.<sup>13</sup> Coke, refined petroleum and chemical products – the export sector with the highest value of the RCA index – do not show a specialisation in the high-quality segments suggesting a predominance of low-cost processing (and re-exports). Other sectors in which the Netherlands is specialised in (including food, beverage and tobacco but also office machinery and computers, publishing, printing and reproduction as well as machinery and equipment etc. have higher shares of exports in the high-price, high quality segment.

**Figure 2.11. Revealed comparative advantage and export composition by price segments, manufacturing industries, 2010**



Note: The high (low) price segment is defined, approximately, as those export products whose unit values are above (below) the world average unit value by more than 25%. For an exact definition, see Cheptea et al. (2008).

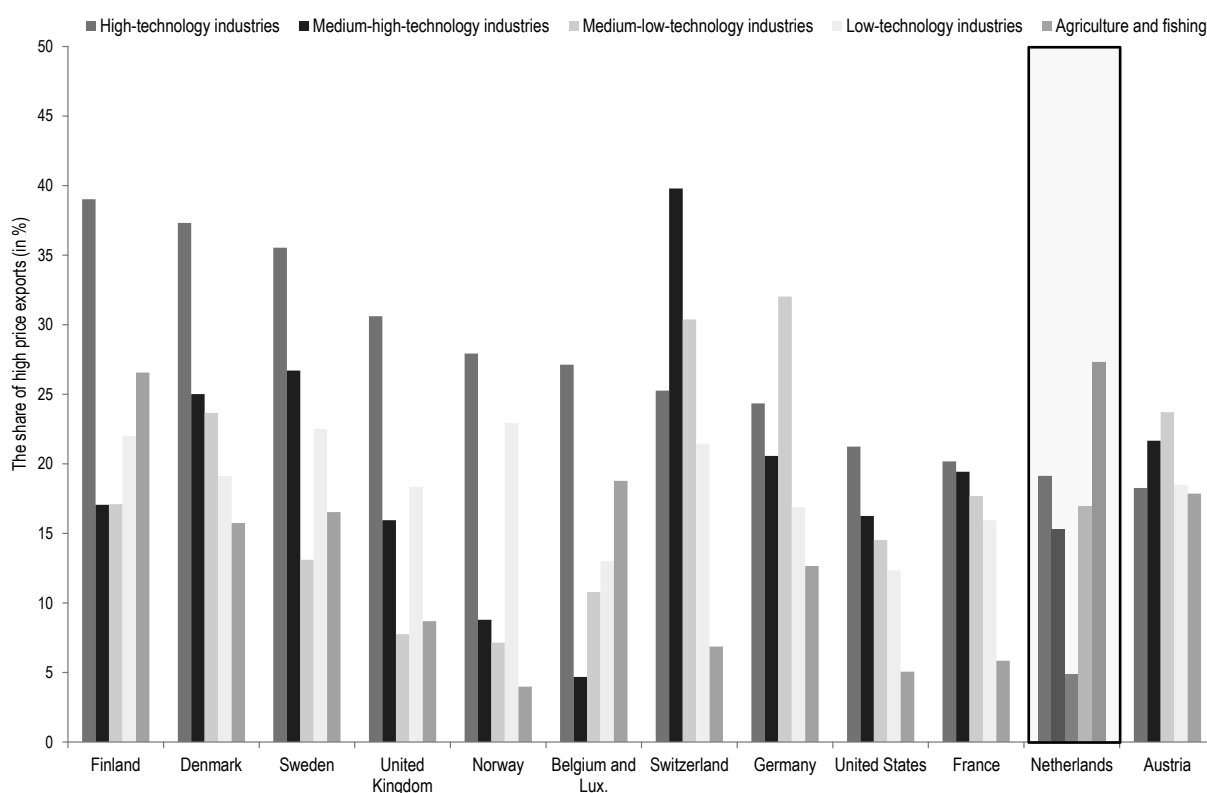
Source: OECD calculations based on the CEPII-BACI database; Gaulier and Zignano (2010).

Cross-country comparisons of indicators based on export prices (unit values) suggest that high-quality segments have a smaller share of manufacturing exports than in peer countries. Typically, the most advanced economies focus on the most valuable products, especially in high-technology manufacturing (Figure 2.12). The Netherlands, however, seems to have a relatively low share of the high-price segments in each manufacturing

subfield.<sup>14</sup> However, in the agricultural sector, more than 25% of products are in the high-price category, partly because the sector’s economic strength and innovation capability enables it to be competitive in the highest-value segments.

Hausmann and Hidalgo (2013) identify agriculture products and chemicals as the main source of comparative advantage, based on existing export patterns. At the same time, they point to the weak contribution of machinery in comparison to other highly developed economies. Combined with increased competition from emerging economies in the low value-added segments and the on-going erosion of Dutch market share in these segments (e.g. agriculture products), Hausmann and Hidalgo find that this specialisation may pose a serious risk to the country’s future export success and earnings capacity unless it moves to more sophisticated export categories. They indicate that the knowledge base needed for such a shift may already be present in the Netherlands.<sup>15</sup>

**Figure 2.12. The share of high-price exports by technological intensity, 2010**



*Note:* Technology intensity classifications are from Eurostat and based on R&D spending intensity at the 2- or 3-digit industry level.

*Source:* OECD calculations based on the CEPII-BACI database; Gaulier and Zignano (2010), “International Trade Database at the Product-Level. The 1994-2007 Version”, *CEPII Working Paper*, No. 2010-23.

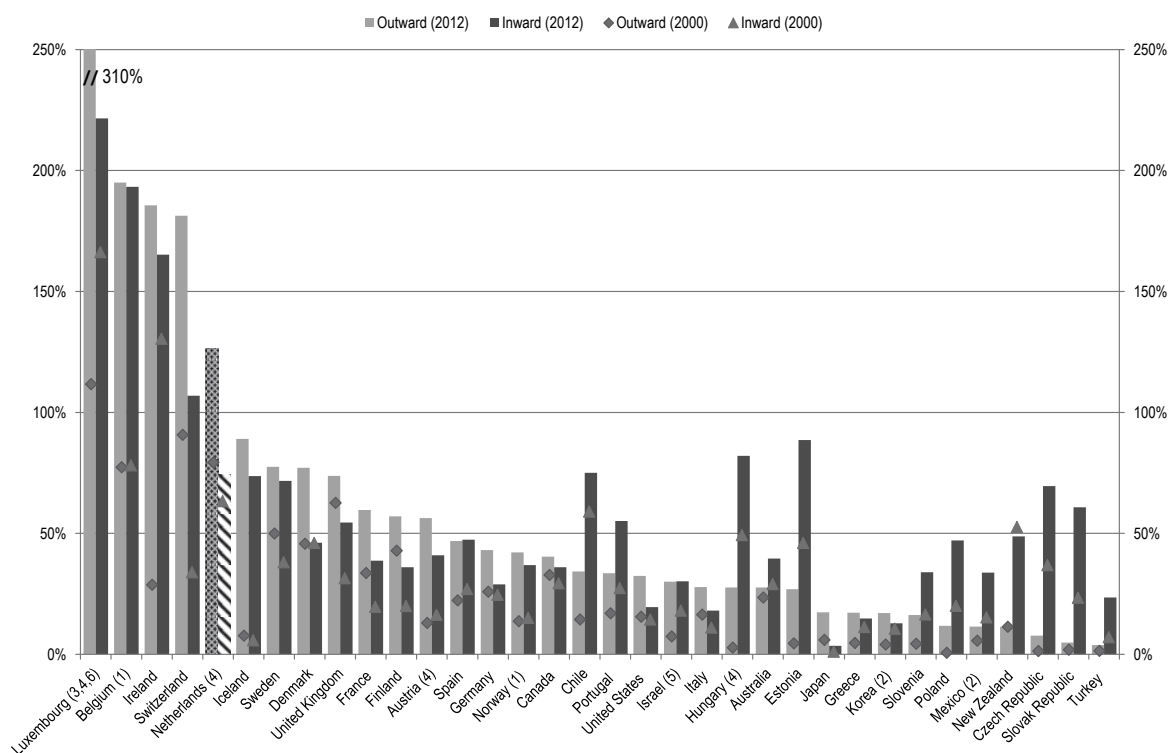
As noted above, and in line with the Netherlands’ role as a major European logistics hub, more than 40% of exports are re-exports. Moreover, “Dutch re-exports are still much more high-tech intensive than Dutch-manufactured products” (Statistics Netherlands, 2012, p. 37). Indeed, most Dutch re-exports consist mostly of high-technology products. As one may expect, while more “sophisticated”, re-exports contain a lower share of domestic value added than domestically manufactured goods. Every euro of re-export

adds only 7.5 cents to the Dutch economy, as compared to 59 cents for every euro of export of Dutch-manufactured products (Kuypers et al., 2012; Statistics Netherlands, 2012).

Foreign direct investment can affect a country's innovation performance both directly and indirectly. It can boost host countries' productivity because firms receiving FDI often gain in efficiency through the transfer of technology, better organisational and management practices, human resources, or better integration in supply chains and international markets. In addition, knowledge spillovers may lead to efficiency improvements in the wider population of domestic firms. These improvements may occur in the same sector, in upstream or downstream firms (suppliers or customers), or in regional innovation networks involving foreign-controlled firms. FDI can also stimulate innovation indirectly, e.g. via increased competition.

The great degree of openness in international trade is also reflected in the Netherlands' position in terms of international investment. The outward and inward FDI stock, as a fraction of GDP, is one of the highest among OECD member countries, after Luxembourg, Ireland, Switzerland and Belgium. However, it is important to bear in mind that these numbers are heavily influenced by the choice of location not only for production but also for headquarters and special financial institutions (OECD, 2014).

**Figure 2.13. The stock of outward and inward FDI as a % of GDP**



Notes: (1) 2011 instead of 2012; (2) 2001 instead of 2000; (3) 2002 instead of 2000; (4) data excluding special purpose entities (SPEs); (5) the statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law; (6) high FDI/GDP ratios observed in recent years are largely due to the creation of the Arcelor Mittal group.

Source: OECD International Direct Investment Database, OECD/DAF Investment Division.



## 2.3. Framework conditions for innovation and entrepreneurship

### *The role of framework conditions*

The macroeconomic and general business environment, product and labour market regulations, the intensity of competition, business finance, the level and quality of entrepreneurship, the tax system and infrastructure all influence a country's innovation performance. Good framework conditions and a healthy business environment are key prerequisites for strong performance in innovation. There are several reasons for the importance of framework conditions:

- Innovation activity requires a medium- or long-term horizon and a sufficiently stable environment in which to carry it out. This is particularly important for R&D and more fundamental types of innovation activity.
- The regulatory framework is of crucial importance for the generation of new technologies and for the speed of their diffusion. Developments in the telecommunications sector in recent decades have demonstrated this.
- When framework conditions are of insufficient quality, they are likely to reduce the effectiveness of policies designed to foster innovation.

Favourable framework conditions facilitate innovation throughout the economy. However, OECD experience shows that “dedicated” policy measures are also needed to address specific market or systemic failures that hamper R&D and innovation. Empirical OECD work has found that both framework conditions and dedicated science, technology and innovation (STI) policies affect innovation performance, separately and in combination. This work has helped to identify the policies, institutions and framework factors that support innovation effectively (Jaumotte and Pain, 2005a; 2005b; Khan and Luintel, 2006; Box, 2009; Westmore, 2013).

Overall, framework conditions for innovation and entrepreneurship in the Netherlands are supportive and have contributed to good economic performance. This section considers the broad features of entrepreneurial activity and key framework conditions that support innovation in the areas of finance, infrastructure and product market competition. In many respects, the Netherlands has an excellent business environment: it is at the top among developed economies in terms of early-stage entrepreneurial activity (Xavier et al., 2013, *Global Entrepreneurship Monitor*, *GEM*). The overall attractiveness of framework conditions is confirmed by the Expert Survey in the *GEM*). However, there seem to be some barriers to growth after the start-up phase (Criscuolo et al., 2014). An important inhibiting factor seems to be the increased scarcity of bank lending since the financial crisis, especially to small and medium-sized enterprises (SMEs) (ECB, 2014), combined with the still limited – but growing – role of venture capital in risk financing (OECD, 2013g). The government is aware of the need to address the shortfalls in the area of finance, but the financial sector's resistance to risk taking is still likely to hinder the growth of businesses.

The most recent *Global Competitiveness Report* (World Economic Forum, 2013) puts the Netherlands in eighth place, down from the previous year's fifth place owing to the deterioration of financial conditions originating in the banking sector. It also refers to labour market issues (see below): dismissal regulations are relatively rigid for a leading economy, especially when compared to Denmark, the United Kingdom and Switzerland. However, the *Global Competitiveness Report* acknowledges that the Netherlands still has an outstanding education system, high-quality infrastructure, efficient product markets and a highly sophisticated business sector. The Regional Competitiveness Index (Annoni and Dijkstra, 2013) of the European Commission puts the Netherlands in first place among EU

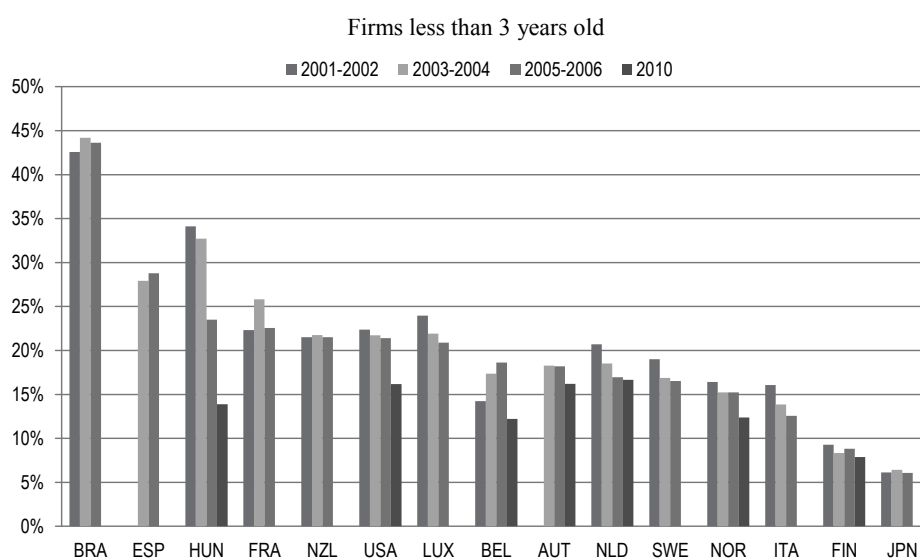
members, based on an assessment of regional indicators and the excellent performance of the Utrecht, Amsterdam and the area around Eindhoven.

### *Stylised features of entrepreneurship*

A growing body of evidence shows that entrepreneurship and the creation of young businesses play an important role in innovation (Lerner, 2010; OECD, 2013f), including the more fundamental or even “radical” innovations that are often pioneered by young, small enterprises, as older incumbents tend to make incremental innovation along established paths. A good overview and understanding of firm dynamics, especially in young enterprises, is therefore important. The OECD’s Dynamics of Employment (DynEmp) project, with the participation of national contacts with access to the most complete source of company information (business registers), has recently led an extensive micro-data collection effort. It has gathered new information on employment dynamics for 18 countries from 2001 to 2011, by firm size, age and industry (Criscuolo et al., 2014). For the Netherlands, three of the project’s results are particularly important:

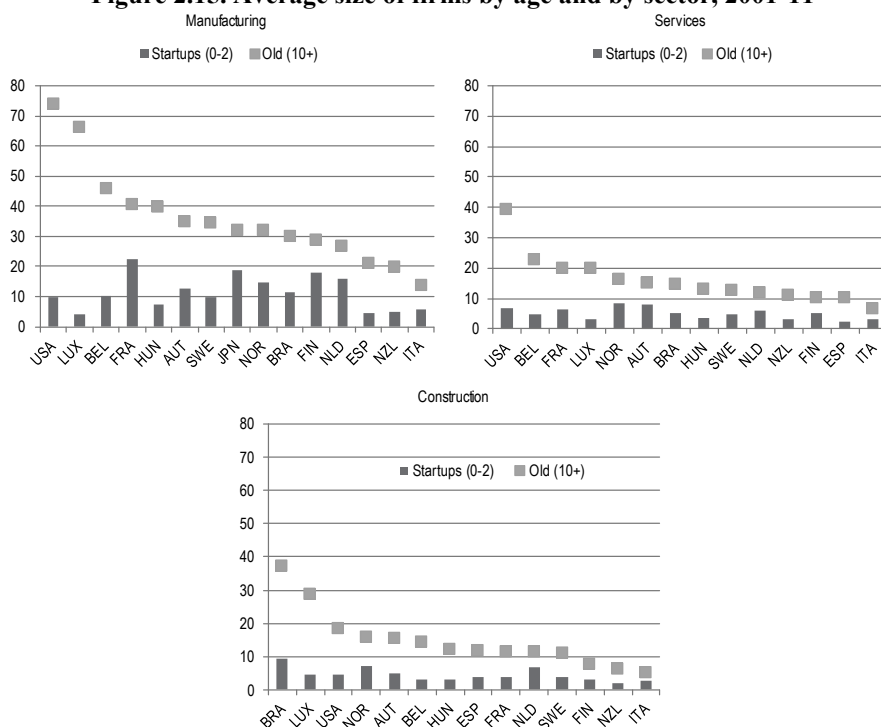
- First, the share of start-up companies (those with more than one employee) is relatively low in the Netherlands, and is declining over time, as for other countries in the sample (Figure 2.14).
- Second, Dutch companies start relatively large but do not grow very dynamically as they age (Figure 2.15), confirming a widespread concern about apparent barriers to growth.
- Third, the share of firms that never grow beyond one employee is among the highest in each main sector (manufacturing, business services and construction), and in fact leads in construction, echoing the prevailing view that there are many self-employed in these sectors (Figure 2.16).

**Figure 2.14 The share of start-ups**



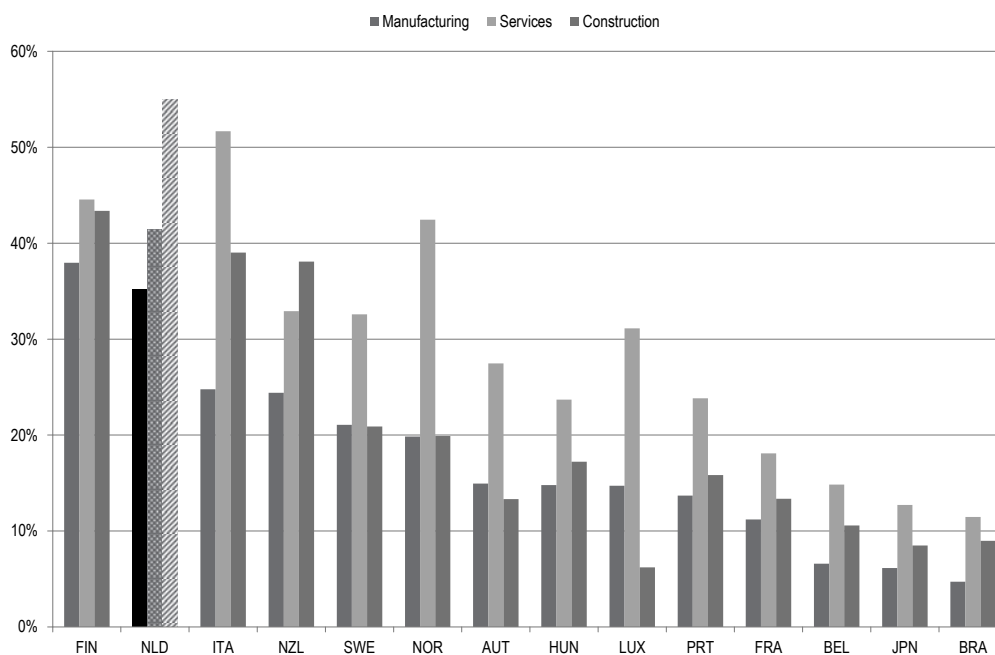
*Note:* As a percentage of all firms in the total private business sector. Start-ups are firms aged from 0 to 2 years. Data for Japan refer to establishments in the manufacturing sector. For the Netherlands years 2006-09 are excluded from the calculations owing to changes in the process of compiling the Dutch business register. Data excludes firms with always one employee and appearing one-year only.

*Source:* Preliminary results from the OECD’s DynEmp project (Criscuolo et al., 2014) based on national business registers.

**Figure 2.15. Average size of firms by age and by sector, 2001-11**

*Note:* Size is measured as the number of employees, averaged over all firms in the age categories. Differences across business registers, especially the treatment of mergers and acquisitions, and inactive firms may influence the results. Firms that appear for only one year or that never exceed one employee are excluded.

*Source:* Preliminary results from the OECD's DynEmp project (Criscuolo et al., 2014) based on national business registers.

**Figure 2.16. Share of employment in firms that do not exceed one employee**

*Note:* Differences across business registers, especially in the treatment of mergers and acquisitions, and inactive firms may influence the results.

*Source:* Preliminary results from the OECD's DynEmp project (Criscuolo et al., 2014) based on national business registers.

Veugelers (2009) and Czarnitzki and Delanote (2013) argue that EU start-ups face high barriers to growth. They cite access to finance as one of the major reasons. Bartelsman et al. (2004) and Bravo-Biosca et al. (2013) confirm empirically that barriers to growth are relatively high. The hurdles young companies face discourage innovation.

Other sources, relying on surveys of individuals' entrepreneurial aspirations, indicate a high share of people considering starting a business, but with aspirations for job growth that are relatively low (Xavier et al., 2013, *Global Entrepreneurship Monitor*). Taken together – and bearing in mind the favourable regulatory conditions for the creation of businesses and the attractive tax treatment of the self-employed – these findings suggest that while it is relatively easy to start a business, there may still be barriers to growth. With low transaction costs owing to the use of ICT and important network effects, the optimal size of many new and creative industries may be smaller than for traditional businesses. Nevertheless, the most productive and successful companies should still find it attractive to scale up. Therefore, lowering or removing barriers to expansion should remain an important focus of policy.

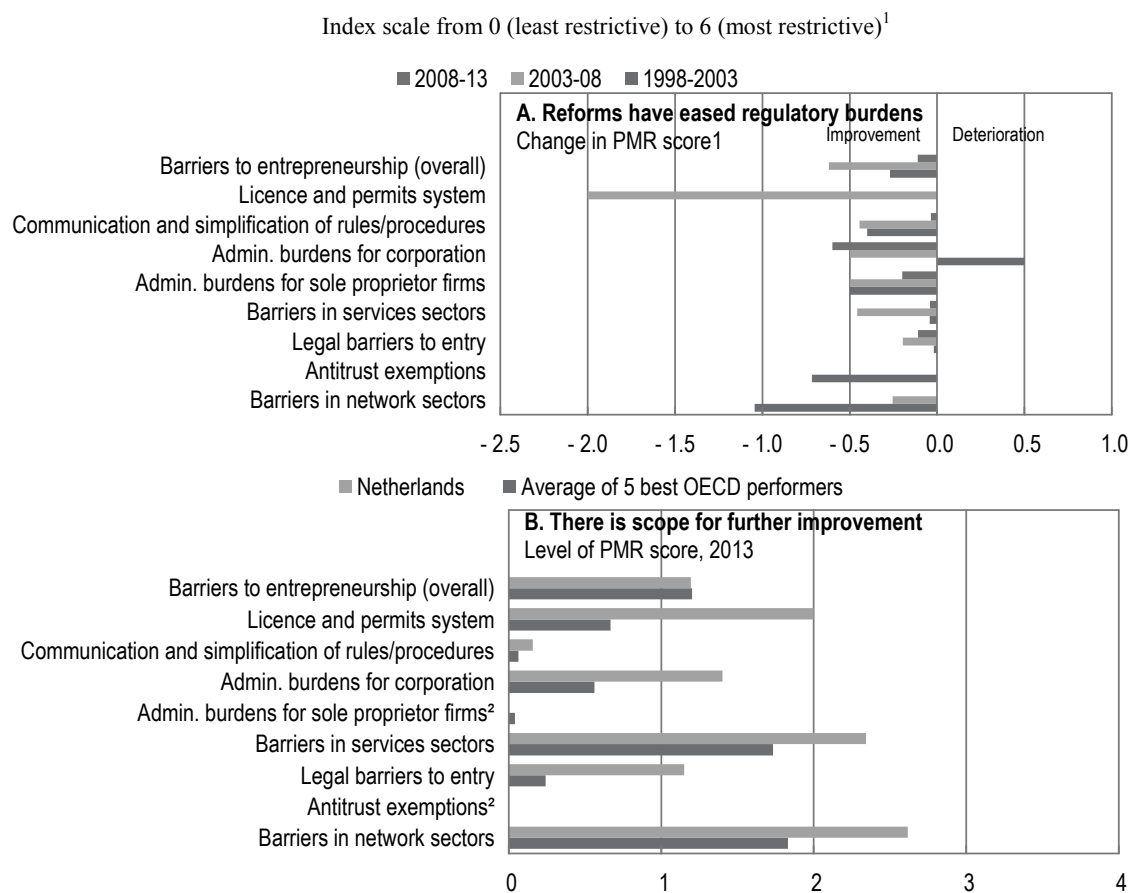
The recently set-up Ambitious Entrepreneurship programme aims at helping new business founders in realising their growth aspirations and is a welcome initiative exactly in this spirit. In addition, labour regulation can also play a key role. Easing the costs of dismissal of permanent workers should also facilitate the experimentation that is necessary for an efficient selection among start-ups and the rapid growth of successful ones. While fixed-term employment contracts and subcontracted workers offer an alternative source of flexibility, these workers usually have lower skill levels or less experience (e.g. students). Allowing a more flexible re-allocation of the more experienced group of workers could create a more dynamic labour market, where longer tenured employees have more incentives to change jobs (Gerritsen and Høj, 2013a). Indeed, the future availability of technically skilled workforce is critical for dynamic firm growth. In that respect, the recent initiative (TechniekPact) is a step in the right direction.

### ***Policy environment affecting entrepreneurship***

The Netherlands has continuously improved its business environment over time, lowering barriers to competition and making entry and exit less costly. Figure 2.17 shows successive improvements in the barriers to entrepreneurship dimension of the OECD Product Market Regulations (PMR) index and its components (OECD, 2014; Koske et al., 2014; see Box 2.2 below).

Despite significant improvements in the licensing and permit system, and in the area of administrative burdens for corporation, there is still a marked regulatory gap compared to the best OECD performers. The administrative burdens in particular may hold back firm growth and thus contribute to the symptoms described above.

In line with the favourable picture presented by the PMR indicators, other sources confirm that the time required to open and close a business is among the shortest among OECD countries. Bankruptcy laws are favourable (Andrews and Criscuolo, 2013; World Bank and IFC, 2013). The Netherlands is in sixth place in the World Bank's Doing Business ranking for the indicator on resolving insolvency: a high recovery rate, a relatively short time and a low cost to the estate.

**Figure 2.17. Product market regulations: barriers to entrepreneurship**

1. There was no change in the PMR score for the licence and permits system in 1998-2003 and 2008-13, for antitrust exemptions in 2003-08 and 2008-13, or for barriers in network sectors in 2008-13.
2. For administrative burdens for sole proprietor firms the PMR score of the Netherlands is zero (i.e. least restrictive). For antitrust exemptions the PMR scores are zero.

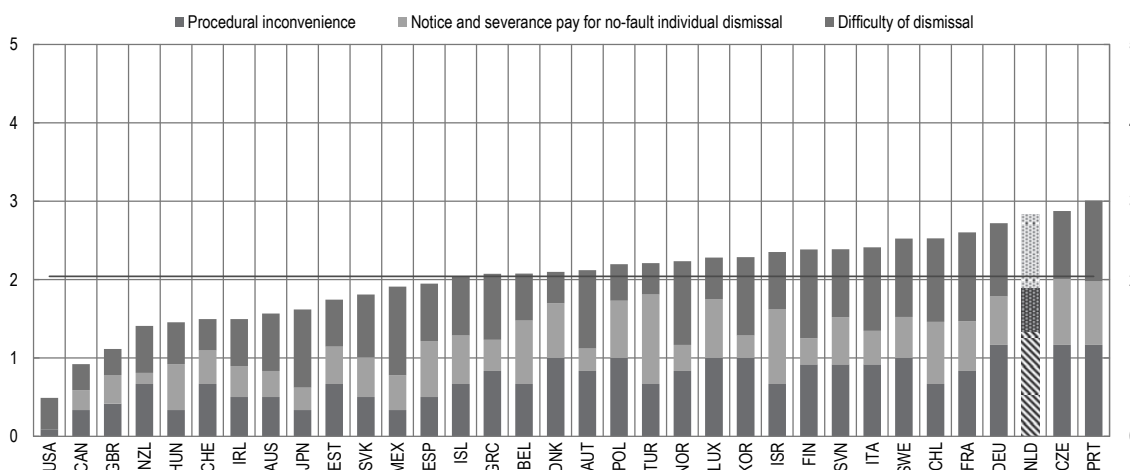
Source: Koske, I. Wanner, R. Bitetti and O. Barbiero (2014), “The 2013 Update of the OECD Product Market Regulation Indicators: Policy Insights for OECD and non-OECD Countries”, *OECD Economics Department Working Papers*, forthcoming; and OECD (2014), *Economic Survey of the Netherlands*, OECD Publishing.

According to surveys on attitudes towards entrepreneurship, many in the Netherlands see entrepreneurship as a good career option. However, there are indications of a need for better acceptance of occasional failure. The low fraction of positive answers to the statement “Entrepreneurs who failed should have a second chance” puts the Netherlands towards the bottom of the list among OECD countries (OECD, 2013c). To help improve entrepreneurial attitudes and, in particular, further promote entrepreneurship among students, the government has recently scaled up ongoing efforts, following earlier initiatives in Finland, Denmark and Norway. There are already signs of success in this area. The Netherlands is, e.g., one of the highest scoring countries in Entrepreneurship Education in the Global Entrepreneurship Monitor (Xavier et al. 2013).

Labour market regulations for permanent contracts are relatively restrictive (see above and also Figure 2.18), and figure just after the first-ranking “access to financing” – also mentioned in the *Global Competitiveness Report* (World Economic Forum, 2013) – as the most problematic factors for doing business (Figure 2.19), especially as regards

hiring and firing practices and lack of flexibility in wage setting. It is too early to know to what extent the plans put forward by the government in the first half of 2013 and expected to come into force in 2015 will ease the situation (OECD, 2014). Lowering the strictness of employment protection legislation may be particularly helpful for grass-root innovation which requires experimentation. The risk of high downsizing costs should not deter expansion (OECD, 2013f; Bartelsman et al., 2010).

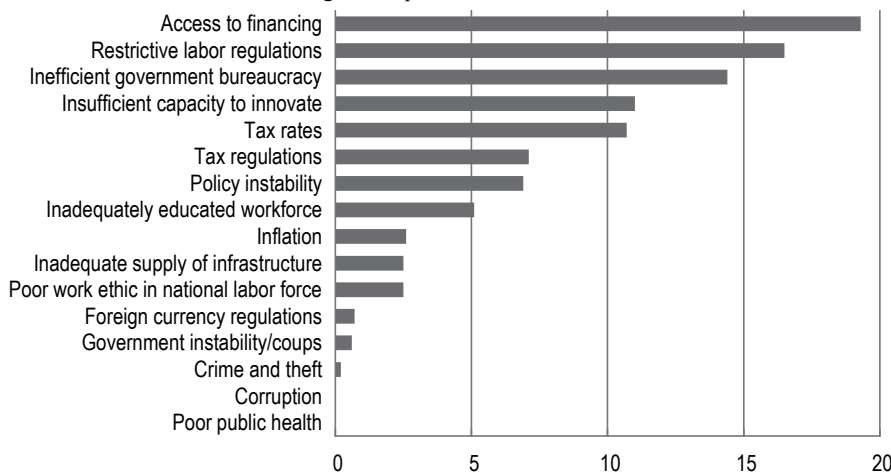
**Figure 2.18. The strictness of employment protection legislation**  
Scale from 0 (least stringent) to 6 (most restrictive), 2013



*Note:* The figure presents the contribution of different subcomponents of the indicator for employment protection for regular workers against individual dismissal (EPR). The EPR incorporates three aspects of protection: i) procedural inconveniences that employers face when starting the dismissal process, such as notification and consultation requirements; ii) notice periods and severance pay, which typically vary by tenure of the employee; and iii) difficulty of dismissal, as determined by the circumstances in which it is possible to dismiss workers, as well as the repercussions for the employer if a dismissal is found to be unfair (such as compensation and reinstatement). The height of the bar represents the value of the EPR indicator.

*Source:* OECD (2013), *OECD Employment Outlook 2013*, OECD Publishing, doi: [10.1787/empl\\_outlook-2013-en](https://doi.org/10.1787/empl_outlook-2013-en).

**Figure 2.19. The most problematic factors for doing business**  
Percentage of respondents, first half of 2013



*Note:* From the list of factors above, respondents were asked to select the five most problematic for doing business in their country and to rank them between 1 (most problematic) and 5. The bars in the figure show the responses weighted according to their rankings.

*Source:* World Economic Forum (2013), *The Global Competitiveness Report 2013-14*, Geneva.

### Box 2.2. The OECD product market indicator

A number of diagnostic tools have been developed to measure product market regulation and benchmark regulatory frameworks. One of these tools is the OECD product market indicators system. The OECD's PMR indicators assess the extent to which the regulatory environment promotes or inhibits competition in markets in which technology and market conditions make competition viable. These indicators have been used extensively over the last decade to benchmark regulatory frameworks in OECD and other countries and have proven useful in encouraging countries to implement structural reforms that enhance economic performance.

The PMR indicator system summarises a large number of formal rules and regulations with a bearing on competition. The regulatory data cover most of the important aspects of general regulatory practice as well as a range of features of industry-specific regulatory policy, particularly in the network sectors and more recently in the area of regulating the Internet economy. This regulatory information feeds into 18 low-level indicators that form the base of the PMR indicator system. These low-level indicators are then aggregated. At the top of the structure, the overall PMR indicator serves as a summary statistic on the general stance of product market regulation.

The PMR indicators have a number of characteristics that differentiate them from other indicators of the business environment. First, in principle, the low-level indicators only record “objective” information about rules and regulations, as opposed to “subjective” assessments of market participants as in the case of indicators based on opinion surveys. This isolates the indicators from context-specific assessments and makes them comparable across time and countries. Second, the PMR indicators follow a bottom-up approach, in which indicator values can be related to specific underlying policies. One of the advantages of this system is that the values of higher-level indicators can be traced with an increasing degree of detail to the values of the more disaggregated indicators and, eventually, to specific data points in the regulation database. This is not possible with indicator systems based on opinion surveys, which can identify perceived areas of policy weakness, but are less able to relate these to specific policy settings.

*Source:* Wöfl et al. (2009), “Ten Years of Product Market Reform in OECD Countries: Insights from a Revised PMR Indicator”, *OECD Economics Department Working Papers*, No. 695, OECD Publishing, doi: [10.1787/224255001640](https://doi.org/10.1787/224255001640) and Koske et al. (2014), “The 2013 Update of the OECD Product Market Regulation Indicators: Policy Insights for OECD and non-OECD Countries”, *OECD Economics Department Working Papers*, forthcoming.

The labour market is characterised by a small flexible segment (often younger workers on temporary contracts or self-employed) and a large, more rigid segment (often older and better skilled workers with strong social protection) (OECD, 2012). This divide (or “duality”) should be reduced. The flexibility of the labour market affects the agility of the innovation system by allowing a timely and smooth reallocation of workers from less successful to innovative and rising sectors and activities (OECD, 2013f).

Some policies have the highest impact at the top end of more productive firms (certain types of dedicated innovation policies), while others facilitate exit of the least productive units (e.g. bankruptcy laws) to free up resources to be used in more productive units. This reallocation of resources towards the most productive units also enhances aggregate productivity, and policies may hinder or facilitate this process. Results by Andrews and Criscuolo (2013) using a cross-country firm level database of inputs, outputs and patenting suggest that the Netherlands is less successful than the Nordic countries and the United States in attracting resources to innovative (i.e. patenting) firms.

Studies focused on the Netherlands – including Kocsis et al. (2009) and Anthony et al. (2012) – conclude that entry and exit barriers are probably not important impediments to growth, in line with the findings, presented above, that the time required in the Netherlands to open and close a business is one of the shortest. Brouwer and van der Wiel (2010) find that competition has both a direct and indirect effect – through innovation – on productivity. They emphasise that for most industries, the Netherlands is far from the

very high intensity of competition that would be detrimental to innovation via the inverted U-shape effect (Aghion et al., 2005).

### *Finance*

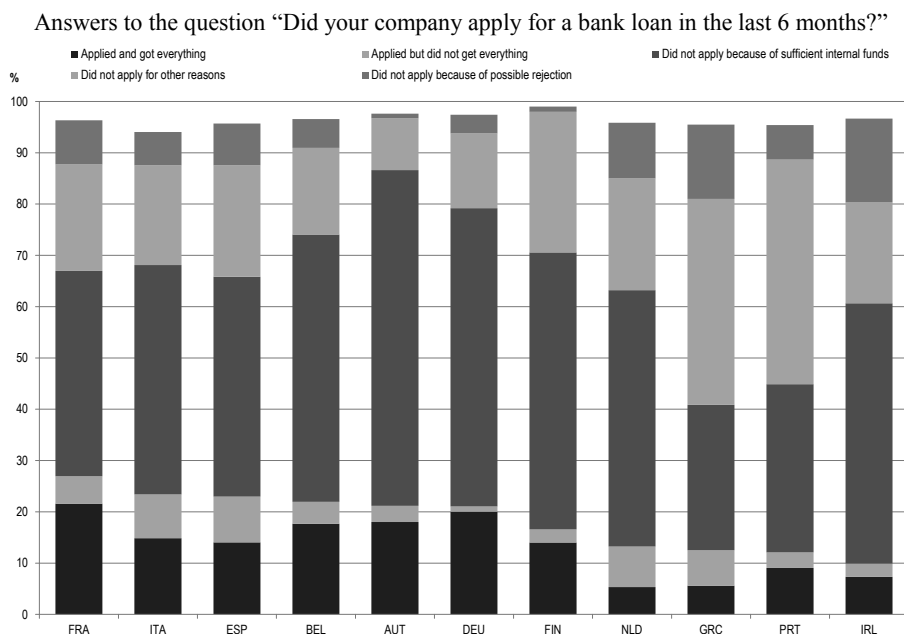
Financial conditions affect the ability of firms to obtain the resources they require. This is especially true for young and small businesses, which tend to be more constrained by a lack of available internal funding or collateral. Some of these businesses play an important role as a source of innovative business models and radical innovations (Henderson and Clark, 1990; Henderson, 1993; Andrews and Criscuolo, 2013). Once successful on a small scale, they need well-functioning financial markets to help them grow and expand the scale and scope of their innovation activities. An environment in which it is easier for successful firms to upscale also creates better opportunities to experiment with new solutions and to innovate.

#### *General financial conditions*

Several sources indicate that credit conditions have been tight for SMEs since the beginning of the financial crisis. The SME lending survey of the European Central Bank shows that Dutch SMEs, anticipating possible rejection, are less likely to apply for credit than firms in Austria, Belgium, Finland and Germany (Figure 2.20). If they do apply, they are less likely to get what they wish. Drawing on the same source, Darvas (2013) notes that despite similar levels of profitability in the Netherlands and these other euro area countries, Dutch firms seem to have difficulties rather like those faced by the more troubled southern euro zone economies. The World Economic Forum (2013) ranks the Netherlands relatively low in terms of ease of access to credit. According to a survey of the Dutch National Bank (De Nederlandsche Bank, DNB) on the evolution of bank lending conditions (Figure 2.21), credit standards for SMEs tightened again through 2013 after easing in the previous two years. Moreover, interest rate differentials between SME loans and other loans have increased substantially since the crisis and barely decreased up to 2012, possibly reflecting a still high risk premium attached to small business lending.<sup>16</sup>

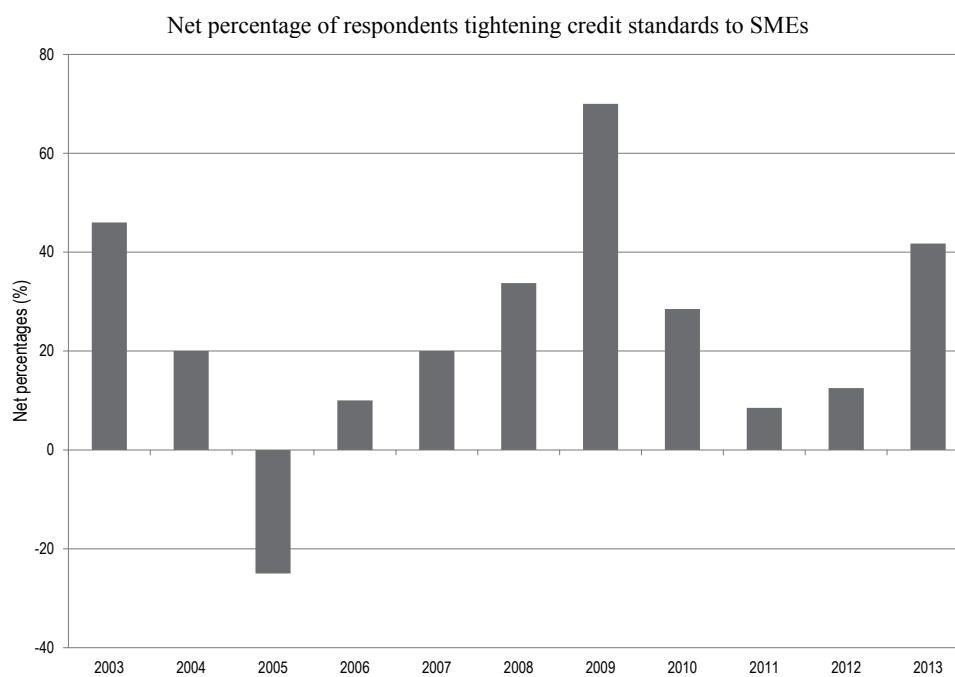
To compensate for the current weakness of the banking sector in providing funds especially to SMEs, the government has set up various schemes to help them obtain credit (Ministry of Economic Affairs, 2013a; OECD, 2013e). Microfinance by Qredits reaches companies which are unable to obtain bank credit (outstanding amount: EUR 35 million); MKB credits (Borgstelling MKB-kredieten) provide guarantees for bank loans to SMEs with little collateral (outstanding amount: EUR 2.4 billion); the GO (Garantie Ondernemingsfinanciering) provides primarily SMEs with guarantees for larger bank loans (outstanding amount: EUR 679 million); the Seed Facility supports private equity firms investing in early stage start-up companies (about EUR 135 million outstanding); and finally, the innovation credit is aimed at R&D projects (with roughly EUR 100 million outstanding). These instruments help to fill in the gap due to low levels of lending by financial institutions, but their size may still be insufficient fully to offset the negative impacts.<sup>17</sup> Restructuring bank's balance sheets is essential for expansion of their lending to SMEs in the medium term (OECD, 2014).



**Figure 2.20. Bank lending constraints for SMEs**

Note: SMEs are defined as firms with 0-249 employees.

Source: ECB (April-September 2013).

**Figure 2.21. Tightening bank lending conditions to SMEs**

Note: The net percentage shows the ratio of banks tightening their credit terms and conditions to banks easing them; the values may vary between -100% (where all banks ease their terms and conditions to a greater or lesser extent) and +100% (where all banks tighten their terms and conditions somewhat or considerably).

Source: De Nederlandsche Bank, Domestic MFI Statistics (2013), changes in credit standards and in demand for loans or credit with MFIs in the Netherlands.

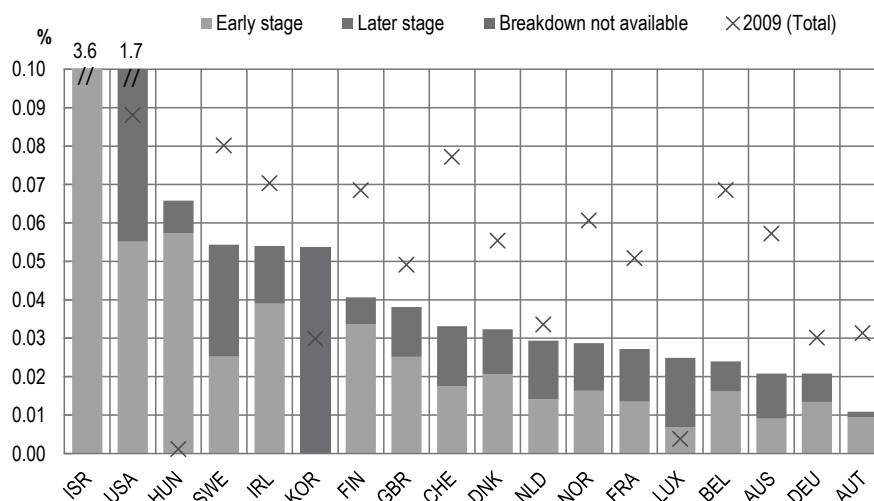
### Risk financing

Evidence of the availability of early stage risk finance in the Netherlands is mixed. In particular, a recent OECD study highlighted the presence of restrictions on banks, pension funds and insurance companies when investing in private equity funds (Silva and Wilson, 2013). This may negatively affect the pool of financial resources and may be at least partially responsible for the small size of the venture capital market, especially the seed and early stages (Veugelers, 2011).

To address this shortcoming, the government has put in place several targeted financing facilities (fund of funds, regional development agencies, the growth facility), and is planning additional ones such as the early-stage instrument and the business angels co-investment facility. The fund of funds and co-investment approaches are considered good practice owing to their reliance on private investors' expertise, incentives and resources. Involving business angels is also a welcome step, and taken together, these facilities have the potential to improve substantially the venture capital investment climate (Figure 2.22).

**Figure 2.22. Venture capital investment**

As a share of GDP, 2012



Source: OECD (2011, 2013), *Entrepreneurship at a Glance*, using data from EVCA (Europe), NVCA (USA), KVCA (Korea), PwCMoneyTree (Israel).

### ICT and transport infrastructure

The Netherlands has a highly developed technological and communications infrastructure, which dates back to the creation of the inter-university network Surfnet. It has one of the highest penetration rates among OECD countries for consumers as well as businesses (OECD, 2013b). Nearly all businesses, irrespective of size, have access to a broadband connection, either fixed line or mobile.

More recent wireless technologies are, however, less pervasive than on average in OECD countries (OECD, 2013b). Furthermore, the prices for subscriptions tend to be somewhat high, generally in the middle or in the upper ranking of OECD countries. This concerns mainly the mobile and wireless market, but also the broadband segment for bundles with high data volume and the fastest connection speeds. For instance, the monthly fee of a wireless broadband basket with 5 gigabytes of traffic was around

USD 27 (measured at PPP) compared to around USD 10 in Denmark, Finland and the United Kingdom. This may suggest that competitive pressures on the telecom and Internet service provider market are not strong enough. The potential entry of a fourth player to the mobile market may have a positive impact in this respect. The current regulatory environment is generally supportive of competition. In particular, the Netherlands, like Chile and Slovenia, requires “network neutrality” by law in order to stimulate competition among Internet service providers.<sup>18</sup>

The Netherlands owes much of its economic success to its highly developed water, rail and air transport infrastructure. Sea ports play an outstanding role, with Rotterdam as Europe’s main port and a gateway to large parts of continental Europe, including Germany and the United Kingdom (OECD, 2012). They are considered to represent “best practices” as regards port performance and efficiency, reflected in aspects such as port planning, land organisation, environmental and climate management, and port communication (Merk and Notteboom, 2013). As such, they can effectively help sustain the high levels and further growth of re-exports and transit trade activities. The country has as well very high road and rail density, which suits its relatively dispersed economic activity, with several important, medium-sized cities and their agglomerations (OECD, 2013d). Schiphol is one of the largest airports in Europe and a hub of economic activity for the surrounding region.

#### 2.4. The role of innovation in future development

Productivity can be seen as the main driver of economic development in the long term, and the major source of differences across countries in GDP per capita (OECD, 2013a; Figure 2.3). As labour market participation has a natural limit, the only source of sustained economic growth is gains in labour productivity. This is especially relevant for developed countries such as the Netherlands, where demographic changes are expected to constrain labour market participation in the years to come. Labour productivity, in turn, is driven by capital intensity and multifactor productivity, i.e. the joint efficiency of the production inputs, labour and capital. The broad picture emerging from the empirical literature is that it is MFP and not capital intensity that is the more important factor in shaping cross-country income differences (Hall and Jones, 1999; for recent empirical work, see Inklaar and Timmer, 2009, and Johansson et al., 2013).

For the most developed countries, innovation is typically the main driver behind increases in the overall efficiency of production inputs (as measured by MFP growth). An advanced country’s long-run economic performance thus relies significantly on the level and quality of its innovation activities, i.e. the ability to generate, transfer and assimilate technological, non-technological, managerial, organisational and institutional innovations. Innovation can make an important contribution to some of the issues identified in this chapter in several ways:

- It can help to increase labour productivity, which has grown more slowly in the Netherlands than in other OECD countries for some time. A boost in labour productivity helps to contain unit labour costs and therefore to strengthen the international competitiveness of Dutch businesses.
- It can also help to improve the quality of products, allow firms to move their output up the quality ladder, or introduce radically new products and services. An upgraded export bundle can also help extend the reach of Dutch exports and benefit more from globalisation and the rise of emerging economies.

The prosperity of countries such as the Netherlands, which are at or near the technological frontier, hinges on maintaining a continuing flow of innovation (Aghion and Howitt, 2005), based both on knowledge and technology absorbed from abroad and to a lesser extent – given the size of the Netherlands – developed at home. Of course, continuously adopting existing best practices and adapting them to the local environment is necessary, but to preserve a top international position, the Netherlands has to engage in new-to-the-world innovation. It is in many ways well equipped to face the challenges ahead. The country not only has a great and long-standing tradition of excellence in science and technology, its science base still excels on many counts and in many areas. It has, and needs to maintain, a high level of absorptive capacity to monitor, screen and adopt advances in science and technology achieved abroad. The innovative performance of the Netherlands is generally regarded as good, although there is scope for improvement, as discussed in this review. These will require stronger investment in R&D and innovation, notably by the business sector, but also excellent framework conditions and well-functioning innovation system that ensures high returns to these knowledge-based investments.

## Notes

1. Depending on the specification of the measures used, the role of different categories of labour (according to skill levels) and of capital (ICT and non-ICT capital) can be assessed separately (Hulten, 2001; OECD, 2001; Pilat and Schreyer, 2002).
2. One of the main determinants of productivity growth is the distance from the frontier, also known as the catch-up hypothesis (see Gerschenkron, 1962, for the original idea, and Acemoglu et al., 2006, for a more recent approach). As a country approaches the most efficient level attainable, further productivity improvements are increasingly hard to achieve.
3. A high productivity level is also captured by the measure of MFP (Johansson et al., 2013). Since measurement of MFP requires more assumptions and more detailed data than labour productivity, some of the results below are based on the latter.
4. Comparisons of productivity at the industry level raise significant measurement challenges. Industry outputs and value added should be converted to a common currency and account for the differences in local price levels, as is done through PPPs for aggregate comparisons. Constructing industry-level PPPs that are suitable for this purpose requires various assumptions and detailed price-level information (See Timmer et al., 2007; and Inklaar and Timmer, 2008).
5. Van Ark et al. (2013) analyse the evolution of MFP growth in the Netherlands and other European countries in great detail. In contrast to the methodology used by the OECD, they control for labour composition and the role of ICT capital.
6. Van Ark et al. (2013) present growth projections for the Netherlands and other EU countries. They forecast moderate MFP growth up to 2025; this compares quite well to other advanced EU countries.
7. To arrive at a better understanding of the drivers of aggregate and industry-level productivity developments, some recent studies focus on the firm level. They document great heterogeneity in productivity across businesses, even within narrowly defined industries (see Bartelsman and Doms, 2000, and Syverson, 2012, for an overview of the literature, and Andrews and Cingano, 2012, and Gal, 2013, for recent results). However, comparing firm-level outcomes across countries is made difficult by barriers to accessing national micro data. A rigorous cross-country comparison of firm-level productivity development using a *distributed micro-data approach* which avoids confidentiality problems is currently conducted at the OECD. The Netherlands participates in this project.
8. Recent OECD projections of labour market participation in the Netherlands predict a decline from the current 65% to 63% by 2030 and to 60% by 2060 (Johansson et al., 2013, Figure 6). This is a significant drop but still leaves the country with one of the highest rates among OECD countries.
9. This declining tendency in the share of total economy value added in nominal terms is due to a combination of developments in relative prices, productivity and the share of production inputs (employment and capital) used in manufacturing. Further analysis

reveals that both declining employment shares and slowing MFP (see Table 2.1) contributed to the decline.

10. Re-exports are imported goods that leave the country with little further processing.
11. Statistics Netherlands (2011) notes that “...the top 1% of Dutch traders generated almost 74% of Dutch imports and 71% of exports” in 2008.
12. The revealed comparative advantage index is an industry-level measure of trade specialisation. Industries with a larger weight in total exports in the country than the weight they have in total world trade have a value larger than one.
13. It has to be noted however that high price is not always indicative of a “quality premium” but may reflect to market imperfections and inefficiencies.
14. The low share of exports in the high-price segment within that industry may partly be due to re-exports of natural resources (e.g. in coke, refined petroleum).
15. Hausmann and Hidalgo (2013) note that there is much to be gained from such a change. Their so-called Opportunity Value Index summarises the value of the option of being able to move easily towards export categories with higher complexity. It is based on the probability of jointly exporting any pair of goods – as an indication of differences in the knowledge content of goods – and on the current export structure of countries.
16. “SME loans” are defined by the DNB and the OECD’s 2013 SME Scoreboard as loans of up to EUR 1 million.
17. According to OECD estimates, based on data from the domestic MFI statistics of De Nederlandsche Bank (2013), new SME loans from financial institutions amount to some EUR 15-20 billion a year. Support programmes such as the innovation credit, the Seed Facility, the SME loan guarantee scheme (BMKB) and Microfinance by Qredits may amount to approximately EUR 0.7-1 billion of investment support annually (Ministry of Economic Affairs of the Netherlands, 2013b; OECD, 2014).
18. Network neutrality requires Internet service providers (ISPs) to treat all users, data, content, platform, etc., equally and to avoid discrimination, i.e. preferable treatment of some services to allow for more traffic but reduce accessibility to other services, typically those that pose a competitive threat to the ISP’s existing services.

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