

2 Boosting productivity and incomes through capitalising on export opportunities

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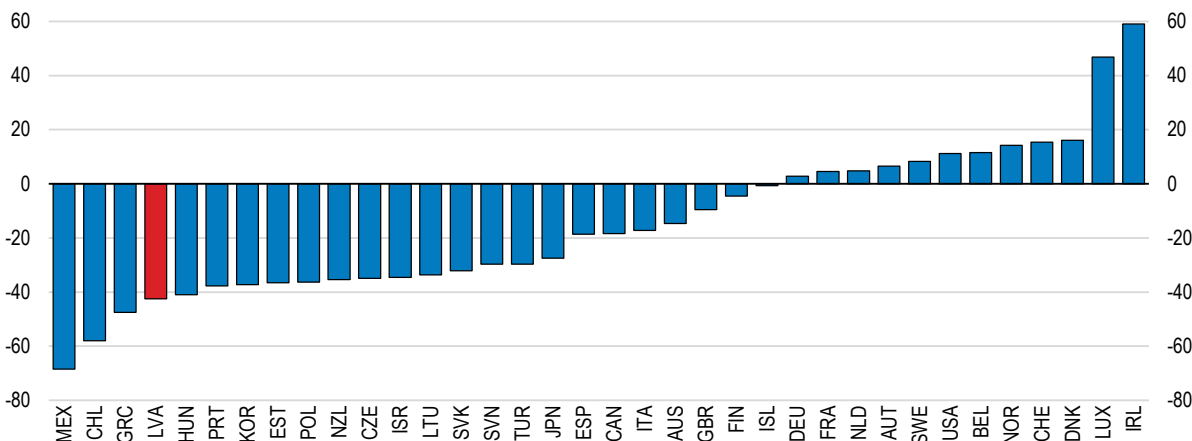
As a small economy with a shrinking population Latvia needs to rely on external markets to foster productivity and growth. Nevertheless, Latvia's export performance has been weak in the last two decades. This may be attributable to its industrial structure, which is still dominated by low- and medium-low-tech firms, so that exporters rely on low labour costs rather than innovation. Business R&D spending as a share of GDP is low and has remained static. Insufficient workforce skills, weak incentives to invest in innovation activities and poor transport infrastructure restrict the ability of Latvian firms to compete, innovate and grow. To promote export growth and diversification, Latvia should improve the business environment for all firms and the governance of state-owned enterprises, intensify managerial skills, strengthen business networks and concentrate its export support on firms entering new markets. Enhancing work-based learning would help unleash the potential of the current pool of employees and facilitate the transformation to more complicated production processes. Increasing financial aid for graduate students, giving schools more flexibility in setting wages, exposing more students to advanced curricula, targeting especially students from poor socioeconomic backgrounds and enabling more non-EU citizens to work in Latvia would all help boost the number of entrepreneurs, innovators and high-skilled workers.

Latvia could foster productivity and income growth by increasing exports

Productivity growth will continue to be the main driver of Latvia's convergence to the living standards of advanced OECD countries (OECD, 2017^[1]). Productivity growth rates have been declining since the Global Financial Crisis, and the convergence with the EU average has slowed. Nevertheless, catch-up has continued, albeit at a slower pace than in neighbouring Lithuania (Chapter 1). The hourly productivity gap with the top half of OECD countries is still about 40% (Figure 2.1).

Figure 2.1. The labour productivity gap with the best performers is still large

Gap in GDP per hour worked against 18 richest OECD countries, PPPs, population weights, %, 2019



Source: OECD (2021), *Economic Policy Reforms 2021: Going for Growth*, OECD Publishing, Paris.

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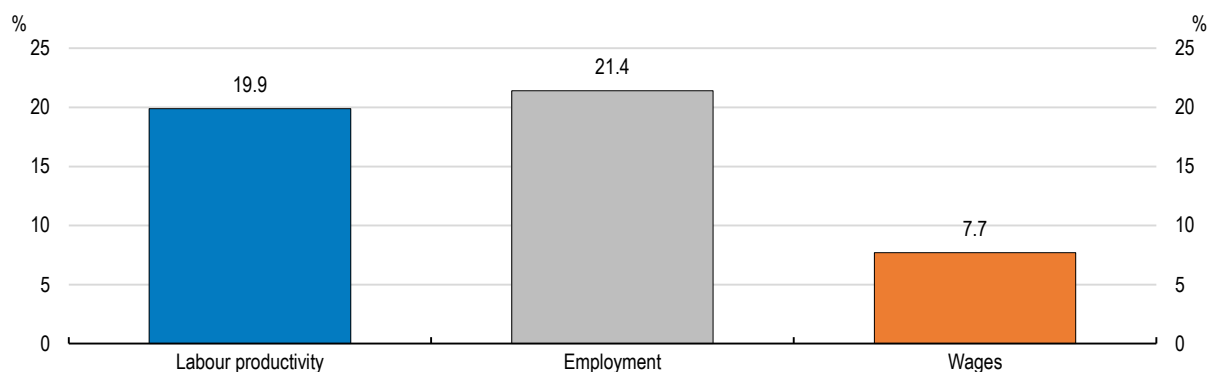
As a small economy Latvia could foster productivity growth through deeper international trade. Countries that have been able to increase their exports-to-GDP ratio over time have also simultaneously managed to improve labour productivity. This is particularly the case for catch-up economies such as the Central and Eastern European countries (OECD, 2019^[1]). Further shifting the economy's orientation to the external sector may be especially beneficial for Latvia, as rapid population ageing will continue to constrain domestic demand, besides limiting the prospects for any contribution from labour supply to output growth (Chapter 1). Likewise, it could improve opportunities for young skilled workers who often leave Latvia, looking for better jobs in other EU countries (OECD, 2019^[2]).

Even between firms with initially similar levels of productivity, size and age, those that start exporting also enjoy substantial productivity improvement at the same time compared to those that do not enter export markets (Figure 2.2) (OECD, 2017^[1]). Gains in productivity and employment are particularly large when exports are related to participation in knowledge-intensive activities, such as Information and Communication Technologies (ICT) and professional services, found in the upstream of Global Value Chains (GVCs) (Benkovskis et al., 2017^[3]). Greater exports and GVC participation generally boost productivity, as closer interactions with foreign buyers and suppliers often involve knowledge transfers, intensive use of high-quality imported inputs and specialisation in niche products. GVC integration, which typically involves attracting FDI, increases business demand for skilled workers and creates higher paying opportunities. However, participation requires upfront investment such as training employees to comply with quality standards, and this acts as an entry barrier for small and less productive firms (OECD, 2017^[1]). GVC involvement may also create or exacerbate inequalities, especially between skilled and unskilled workers as well as between regions hosting high-value exporters and those that do not. Providing a large

share of the population and the country with the opportunity to participate in the external sector is, therefore, essential for boosting economic welfare.

Figure 2.2. Beginning to export leads to gains in productivity, employment and wages

Differences in productivity, employment and wages in 2014 between exporting and non-exporting firms three years after export entry



Note: The chart describes these differences by comparing the export entrants only with the subset of non-exporting firms that are initially as productive and large as the export entrants are.

Source: Benkovskis et al. (2017), "Export and productivity in Global Value Chains: Comparative evidence from Latvia and Estonia", *OECD Economics Department Working Paper*, No. 1448, December, OECD Publishing, Paris.

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This chapter discusses the export-related challenges Latvia faces, focusing on promoting export diversification, enhancing infrastructure and the business environment, improving relevant skills and boosting R&D and innovation from their present low base. Box 2.1 illustrates the importance of these factors for the modernization of export activities, using the Czech Republic as a case study. The main findings and recommendations are summarised at the end of the chapter.

Box 2.1. The transition of the Czech Republic from limited to advanced GVC participation

Countries participate in GVCs in different ways, but there are also regularities in the type of GVC integration and the way countries upgrade their participation. Based on 1990–2015 data, the World Bank classifies countries according to their types of GVC participation: (1) commodities; (2) limited manufacturing; (3) advanced manufacturing and services; and (4) innovative activities. Due to low backward participation (see below) and innovation activities Latvia is classified as a country with limited GVC participation, while most OECD countries are classified as advanced. The basic preconditions for upgrading to advanced GVC participation are political stability, lower trade costs, advanced logistics services and a highly skilled workforce. Improvements to education and employability policies are needed due to the rising demand for technical, engineering and managerial skills. Still, as many of these skills are firm-specific, a regime that is open to foreign skilled labour and provides incentives to invest in training is also needed. At the institutional level the shift demands attention to contract enforcement and protection of intellectual property.

The Czech Republic successfully moved from limited manufacturing GVCs in the 1990s to advanced manufacturing and services GVCs in the 2000s and to innovative GVC activities after 2010. Several factors help explain these transitions. Geographical proximity to Austria and Germany and the supply of skilled, low-cost labour made the Czech Republic an attractive FDI location. In the 1990s its share of high- and medium-skilled workers was almost identical to Germany's, while its average labour costs were less than a third of German levels. Moreover, on top of being open to FDI, the pull factor for foreign

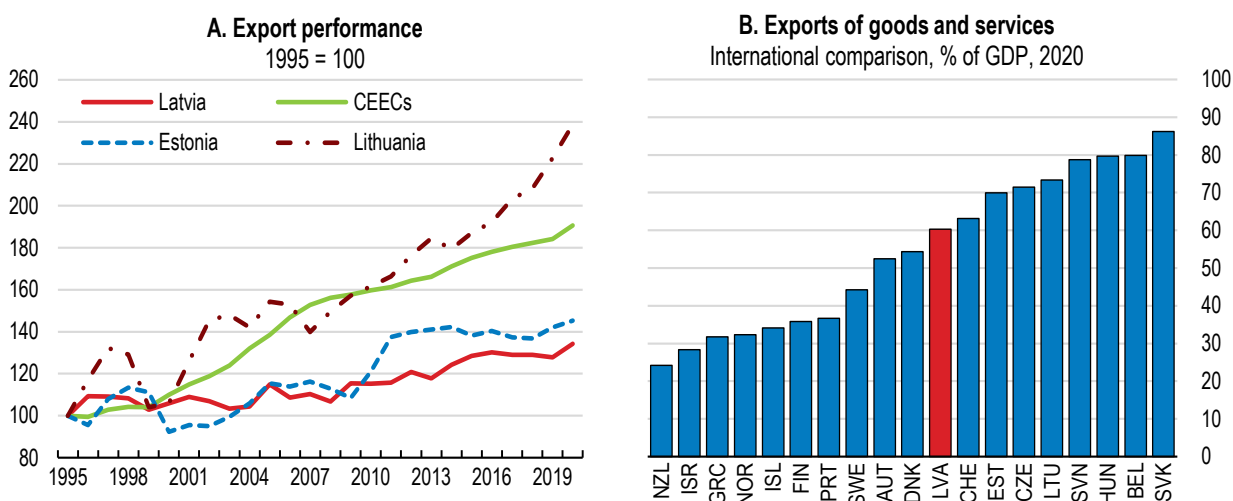
investment was enhanced by a well-developed infrastructure and increased expenditures on education relative to GDP. This led to strong FDI inflows, particularly in automotive manufacturing and business services. Although average manufacturing import tariffs were already low in the early 1990s – at around 5% – they had fallen to less than 2% by 2000. During the 2000s the country emphasised skills-upgrading and innovation. Internet use rose, the share of high-skilled workers climbed further, and R&D expenditure grew from 1.1% of GDP in 2000 to 1.9% in 2015. The largest business R&D expenditures are made by foreign-controlled enterprises. Nevertheless, government expenditures on R&D have more than doubled since 2000. The skilled workforce and the availability of high-quality suppliers are major reasons for the country’s continuing attractiveness to German and other multinationals.

Source: (World Bank, 2020^[4]), (Vičková and Antal, 2015^[5]).

Export performance has been weak, but promising trends have emerged

Latvia’s exports have progressed, but much room for expansion remains. The share of enterprises that export is higher in Latvia than in many European countries, and exports of goods and services have grown in line with GDP in the last decade. Still, Latvia’s export market share – an indication of its competitiveness – has expanded only slowly (Figure 2.3, Panel A), and its ratio of exports to GDP is below that of many comparable small OECD economies (Panel B). Even though Latvia’s participation in GVCs has advanced since the Global Financial Crisis, it is still relatively low (Figure 2.4), particularly the foreign value-added embedded in gross exports (a measure of backward participation). The large number of small and micro firms in Latvian manufacturing and their mostly low-tech orientation could explain its low and static extent of backward participation in GVCs. On the other hand, the increase in forward participation (measured by the domestic value added share of foreign final demand) could be explained by the growing importance of services in total exports (see below), as services often have important forward linkages (Ignatenko et al., 2019^[6]). More robust integration in GVCs would offer opportunities for boosting productivity through knowledge transfer and intensive use of technologically advanced inputs (OECD, 2017^[11]).

Figure 2.3. Latvia’s export performance has been weak compared to neighbouring countries



Note: Export performance is measured in volume terms as actual growth in exports relative to the growth of the country’s export market. CEECs is calculated as an unweighted average of Czech Republic, Hungary, Poland, Slovak Republic and Slovenia.

Source: OECD Economic Outlook database.


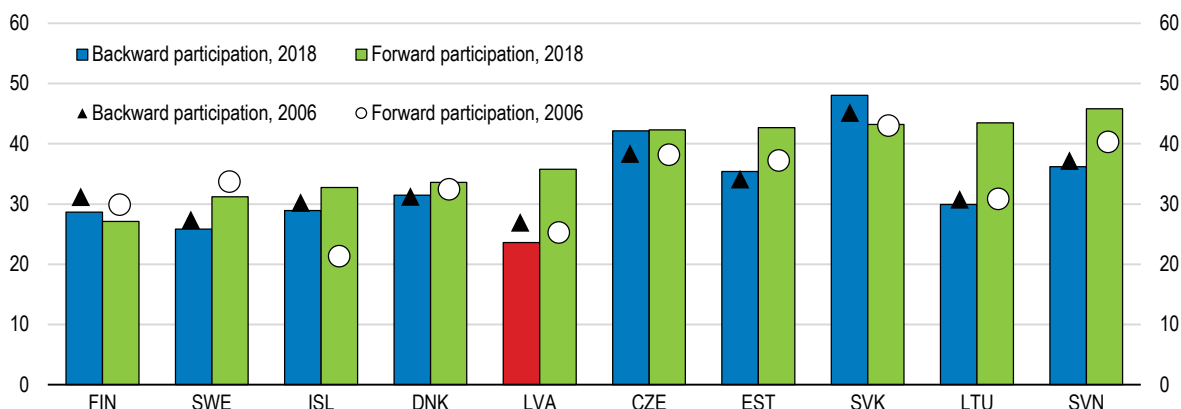
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Figure 2.4. Latvia's participation in GVCs has remained limited



Note: Backward participation is measured by the foreign value added share of gross exports. Forward participation is measured by the domestic value added share of foreign final demand.

Source: OECD Statistics on Trade in Value Added.

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This weak export performance may be attributed to two major factors. First, labour costs have increased considerably faster than labour productivity and compared to labour costs in the average EU country (Figure 2.5), leading to a deterioration in cost competitiveness, given Latvia's adoption of the euro in 2014. In the last decade, its relative unit labour costs have risen more quickly than in all other OECD countries, except Iceland. Second, in contrast to the trend in high-income OECD countries, Latvia has not moved towards producing products that have experienced the fastest expansion in world demand (such as pharmaceuticals) but often require high R&D spending. In contrast, production remains specialised in mature and relatively low-complexity products (see below). Therefore, the share of Latvia's export value in which at least one big emerging market is also specialised is high (Araujo, Chaux and Haugh, 2018^[7]).

Figure 2.5. Labour costs have increased faster than labour productivity

Annual average percentage change



Note: Labour productivity refers to real GDP per hour worked and labour compensation to average compensation per hour worked (deflated by the GDP deflator). CEECs is calculated as an unweighted average of Czech Republic, Hungary, Poland, Slovak Republic and Slovenia.

Source: OECD Productivity database.

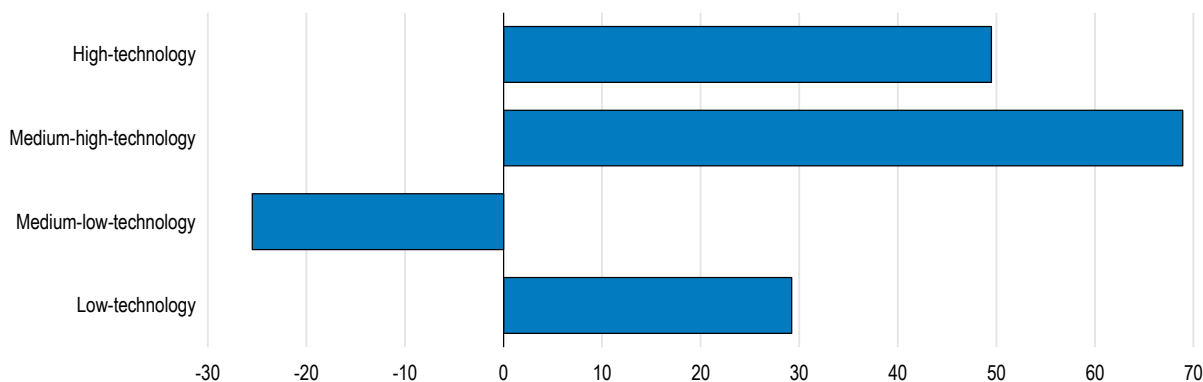
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Low-tech sectors still dominate Latvian manufacturing

Low-tech sectors still dominate Latvian manufacturing. Exports and productivity in high- and medium-high-tech sectors have been growing faster than those in lower-tech-intensive sectors (Figure 2.6). In particular, the shares of computer, electronics and optical products, motor vehicles and electrical equipment in total manufactured exports have doubled since 2010. However, the contribution of high- and medium-high-tech sectors to productivity growth remains small due to their small share in output (Figure 2.7) and employment. Reallocation of labour and capital will be crucial for future labour productivity growth, as labour productivity in high-tech industries is almost twice the manufacturing average (LV PEAK, 2020_[8]). Direct investments by multinational enterprises may allow Latvian firms to benefit from the transfer of advanced knowledge and management methods. The stock of inward foreign direct investment (FDI) in Latvia as a percentage of GDP is higher than in the OECD on average after increasing steadily from 2008. Still, manufacturing FDI is concentrated in sub-sectors with relatively low technological intensity (LV PEAK, 2020_[8]). Improving skills as well as the business environment and the quantity and quality of infrastructure (see below) will help Latvia attract FDI and increase backward participation in GVCs.

Figure 2.6. Exports in high- and medium-high-tech sectors are growing fast

Export growth rates in manufacturing by technological intensity, %, 2013-19



Source: OECD calculations based on data from the Central Statistics Bureau of Latvia.


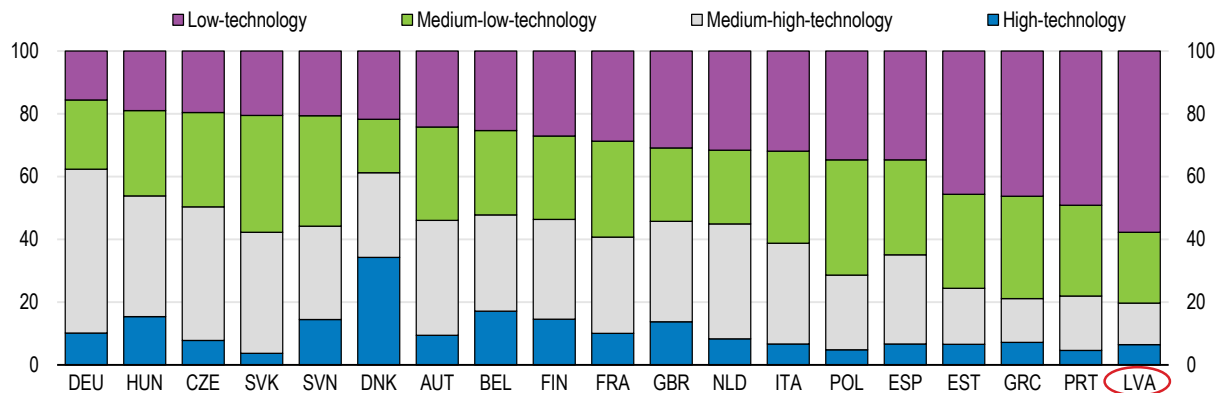
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Figure 2.7. The structure of Latvia's manufacturing is still dominated by low-tech industries

Gross value added in manufacturing by technological intensity, current prices, %, 2018



Note: Based on Eurostat aggregation of the manufacturing industry according to technological intensity, based on NACE Rev.2.

Source: Eurostat.

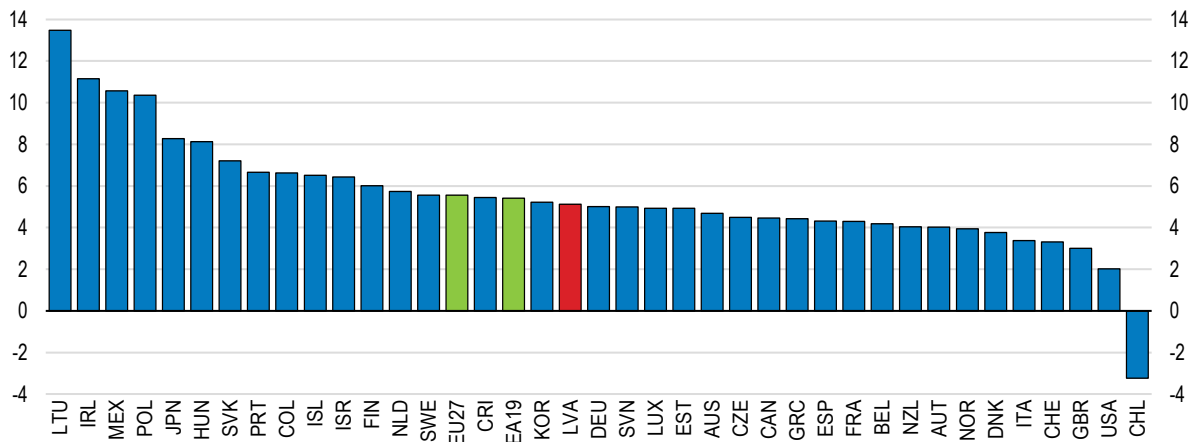
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Growth of services exports has been slow

Services export growth picked up after 2012, and the share of services in total exports increased until the pandemic interrupted tourism. Nonetheless, the increase was slow compared to neighbouring countries (Figure 2.8), and Latvia has not gained global market share in services. The share of services in economic activity has risen over time in most OECD countries, and population ageing is likely to underpin a further shift in global demand towards services (OECD, 2015^[9]).

Figure 2.8. There has been moderate growth in services exports

Exports of services, annualised growth rate, 2011-2019, %



Source: OECD National Accounts database.

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The main reasons for the relatively slow growth in services exports are a decline in transit traffic from the Commonwealth of Independent States and in the financial services of banks specialising in serving non-EU depositors, following a tightening of anti-money laundering regulations (see Chapter 1). In 2020, the value of financial services exports reached its lowest value since 2004. At the same time the transportation sector is going through structural changes and is unlikely to grow fast in the coming years (Box 2.2). In contrast, ICT services exports have grown rapidly (Figure 2.9) (see below).

Box 2.2. The poor outlook for the transportation sector

Latvia possesses a strategic location on the shore of the Baltic Sea and at the centre of the Baltic countries. This has underpinned a large transportation sector, responsible for about 40% of exports of services.

Nonetheless, the transportation sector is unlikely to grow fast in the coming years. With the volume of freight (especially coal and oil products) transported by rail and through ports declining, the sector was struggling even before the COVID-19 outbreak (Figure 2.8). The decline in cargoes is attributed to a reorientation of Russia's transit flows to its own local ports and the gradual global movement towards more sustainable resources, which implies falling demand for energy cargoes, particularly coal. Transport by rail, which is closely linked to port operation, has slowed as well. Nonetheless, it could improve after the Rail Baltica project is completed in five to ten years. Together with the construction of an intermodal freight terminal, this could solidify the role of Latvia as a regional freight transportation centre.

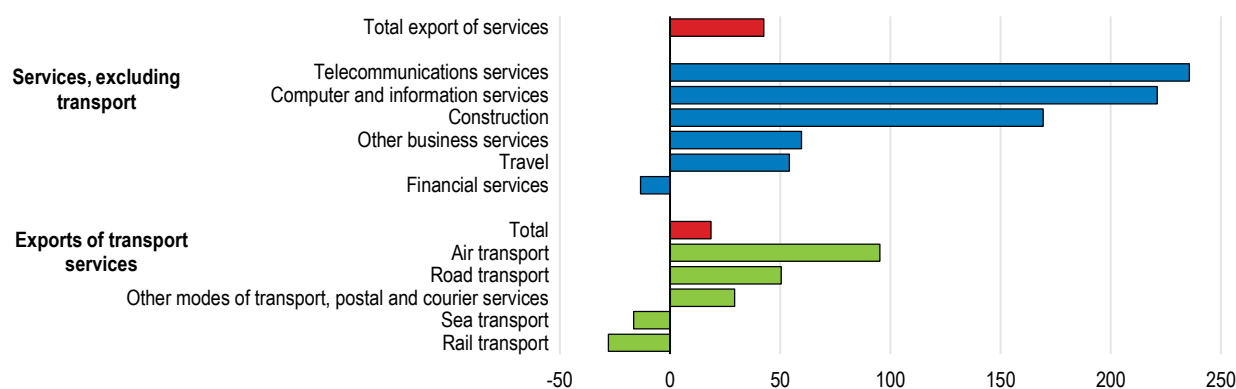
The pandemic has brought additional challenges to the sector. In 2020 the volume of cargo handled by Latvia's ports declined by 28%, led by energy cargoes. Due to physical distancing requirements and other pandemic-related mobility restrictions, demand for passenger transport by air collapsed (CBS, 2021^[10]) and is expected to recover only slowly.

A set of legal acts laying down uniform EU rules for international road transport within the Union's boundaries (the Mobility Package) is likely to reduce the competitiveness of Latvia's freight transport, mainly because it requires that vehicles return to their registration country on a regular basis (Bank of Latvia, 2020^[11]), and Latvia is far from the geographic centre of the continent. According to national calculations, the currently registered fleet of vehicles for commercial transportation could decrease by about 10% because of this new regulation.


The main priority of the Latvian transport sector is diversification to reduce dependency on traditional cargoes. Despite the fall in energy cargoes, other types (such as grain, containers, etc.) have grown. In 2019 there were already more employees in industrial production companies than in cargo-handling terminals in three main Latvian ports. Passenger traffic and the number of cruise ships entering ports were on an upward trend as well. In addition, Latvia should make sure that the modernisation of its rail infrastructure and rolling stock effectively improves safety and regional passenger mobility as well as reduces its carbon intensity and the negative environmental impact of road transport.

Figure 2.9. Exports of transport services were weak already before the COVID-19 outbreak

Exports of services, current prices, 2012-18 %, change



Source: Central Bank of Latvia.

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Exports of goods have been resilient since the COVID-19 shock

Despite the pandemic Latvia was able to expand its overall exports of goods in 2020. They were supported by both the structure of Latvia's trading partners, which experienced smaller-than-average contractions during the crisis, and its export product composition, with relatively heavy concentration on items such as wood, food and electrical equipment, which enjoyed robust demand during the pandemic. However, the trend in services exports has been different: they have seen only a slow recovery from the deep fall in activity observed in the second quarter of 2020. Nonetheless, the hit to services varied substantially. As in many other countries, exports of travel services were hurt most severely and could reach only a quarter of the 2019 level annualised in the last quarter of 2020. Meanwhile, the demand for other services, e.g. telecommunications services, has continued to increase during the pandemic. Moreover, the demand for goods and services that enable digital transformation is expected to rise further.

Promising developments in the ICT sector

The ICT sector is continuing to provide a positive contribution to Latvia's exports and GDP growth. Its shares in GDP and employment are higher than the OECD averages (Figure 2.10), and its labour productivity is almost double that of the aggregate non-financial business sector. In 2020, despite the pandemic, ICT firms' profitability improved, and the number of jobs in the sector remained almost unchanged (Krasnopjorovs, 2021^[12]). Still, there is scope for further growth, as its share in total employment is much lower than in Estonia, for example, and sectoral labour productivity is low compared to most OECD countries (Panel E).

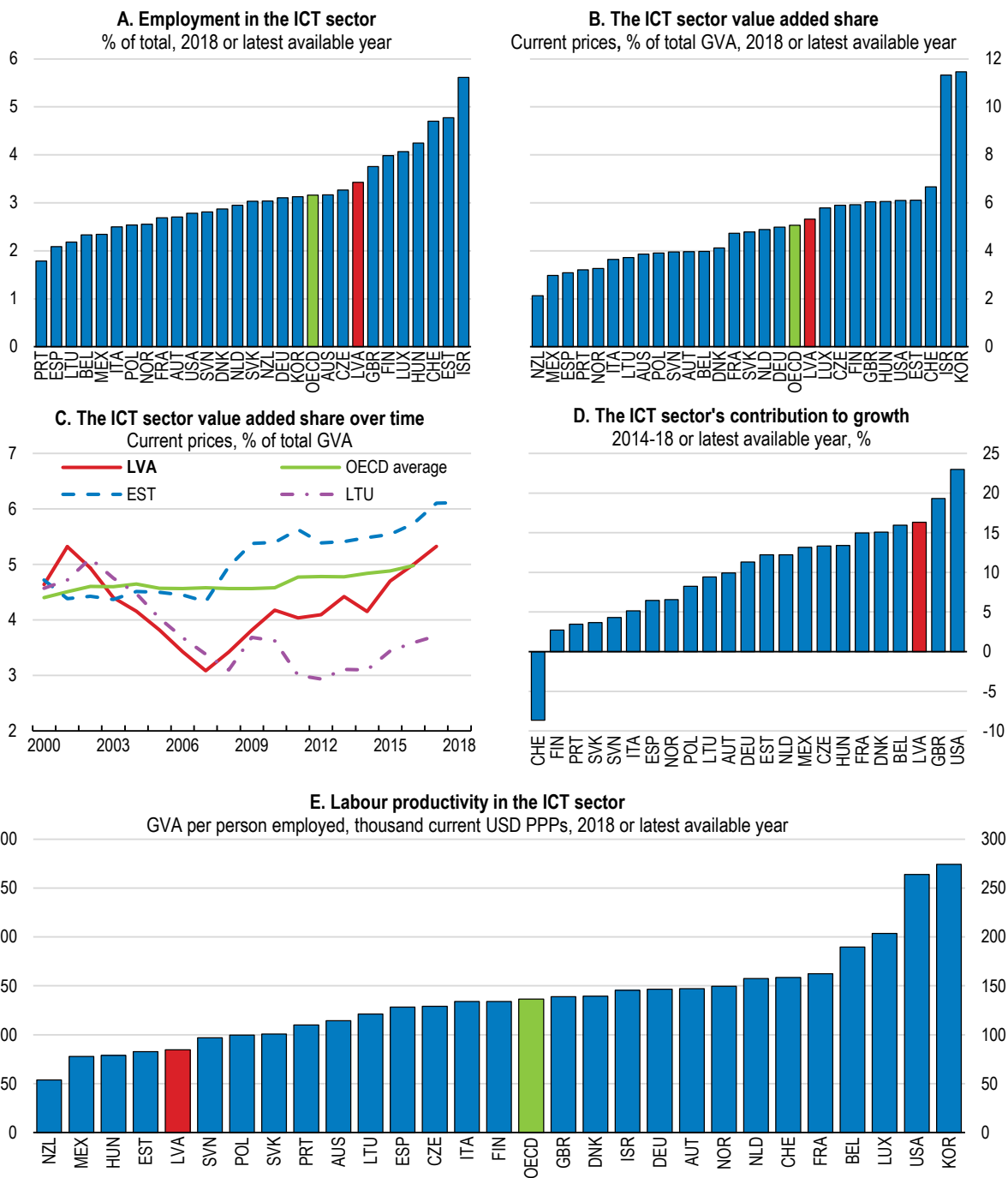
The development of a technology-oriented start-up ecosystem is promising. High entrepreneurial skills help the steadily growing start-up community, which includes more than 400 registered start-ups, mainly around Riga-based universities. The share of ICT-sector employees working for high-growth enterprises – 36% in 2018 – is significantly above the EU average (23%). Many key building blocks of a start-up ecosystem are in place. For example, 13 incubators run by the Investment and Development Agency (LIAA) offer training, mentorships and grants for start-ups for a maximum of four years. Additionally, the government helps the sector by lowering early-stage costs (see below). Still, some ecosystem elements, such as a venture capital (VC) market, are largely missing. In 2019 venture capital investments were at least 10 times smaller than in Estonia, while later-stage ventures were practically non-existent. Scaling up later-stage funding is crucial to keeping promising start-ups in Latvia and continuing to contribute to high-skilled job creation. More institutional investor involvement in funding start-ups, as in the United States, could be one way to boost funding; the government should examine approaches to make investment conditions more attractive to such investors.

Promoting export growth and diversification

Latvia's export performance could improve either if more firms begin exporting (extensive margin) or existing exporters increase current exporting or do not stop exporting (intensive margin). The 2017 *Economic Survey* (OECD, 2017^[11]) underscored the importance of the extensive margin. It showed large performance advantages of exporting firms (Figure 2.1 above) and highlighted key factors increasing a firm's probability of becoming an exporter: high labour productivity and capital intensity, access to credit, having managers or employees who previously worked for MNEs or exporting firms and higher foreign capital shares. In addition, young and larger firms are characteristically more likely to start exporting. Nonetheless, enhancing export performance by existing exporters and their survival are crucial to export growth as well. In fact, between 2011 and 2018, Latvia's growth and volatility of merchandise exports were driven mainly by the increase in exports by incumbent firms and their failure rate (Box 2.3). Three major mechanisms through which current exporters could expand are: adding new products to their export basket, entering new destination markets and increasing export duration/survival.

Figure 2.10. The ICT sector contributes greatly to GDP growth

ICT sector performance



Note: OECD is an unweighted average of available OECD countries. ICT sector includes ISIC Rev.4 divisions 26 (computer, electronic and optical products), 61 (telecommunications) and 62-63 (IT and other information services).
 Source: OECD calculations based on OECD STAN Database and OECD National Accounts Database.

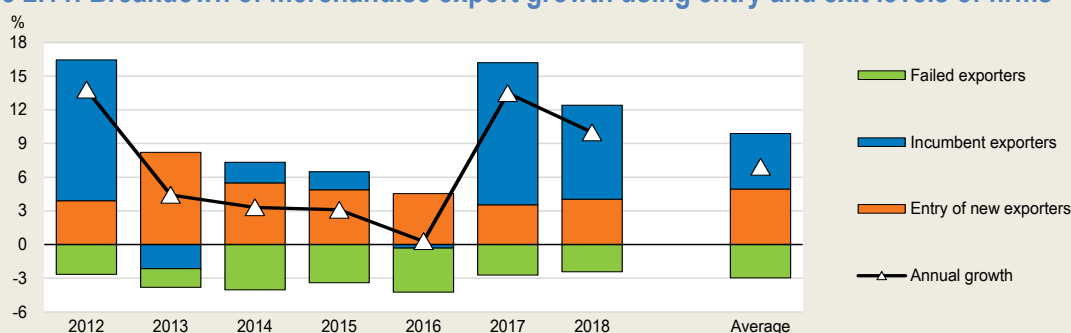
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Box 2.3. Firm-level analysis of Latvia's recent export performance

A joint research project by the Bank of Latvia and the OECD (Benkovskis et al., forthcoming^[13]) disaggregates Latvia's gross merchandise export growth into three main components using data on 4697 (in 2012) to 5690 (in 2018) exporting firms that employed about 30% of all workers in Latvia: (1) firms that established new export products and destinations (Entry), (2) firms that have maintained and expanded their trade relationships (Incumbent) less (3) firms that have stopped exporting or narrowed their trading partners (Exit/Failed).

Latvia's exports of goods increased between 2011 and 2018 by an average of 6.9% per year (Figure 2.11). The contribution of new exporting firms to export growth was large and relatively stable. Over the same period firms that started exporting contributed about 5 percentage points to the average annual growth rate and incumbent firms that increased exports contributed another 5 percentage points. The contribution of incumbent firms explains most of the volatility of export growth between years, while exit of exporting firms reduced the value of the export basket by 3 percentage points on average.

Figure 2.11. Breakdown of merchandise export growth using entry and exit levels of firms



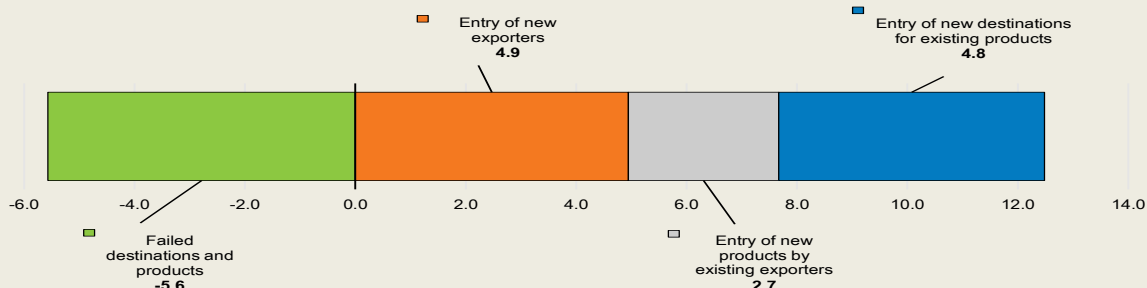
Source: K. Benkovskis, P. Jarrett, Z. Krill, O. Tkacevs and N. Yashiro (forthcoming), "Determinants of firm and product survival in external markets", *OECD Economics Department Working Papers*, OECD Publishing, Paris.

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Breaking down export growth by products and destinations (Figure 2.12) highlights the role of incumbent exporters and their survival, as firms that export a specific product can enter or exit from a foreign market. Adding new destinations and products to the existing firms' export basket contributes about 7.5 percentage points to the average annual growth rate. Exiting from destinations lowers the annual growth rate by close to 6 percentage points. Expanding exports to new markets and holding on to existing markets are, therefore, crucial for improving export performance.

Figure 2.12. Breakdown of merchandise export growth using entry and exit levels of product-destination pairs

Average annual % change, 2012-18



Source: K. Benkovskis, P. Jarrett, Z. Krill, O. Tkacevs and N. Yashiro (forthcoming), "Determinants of firm and product survival in external markets", *OECD Economics Department Working Papers*, OECD Publishing, Paris.

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Expanding export product diversity and complexity

Increasing export diversification into new products that are more complex can help raise incomes and strengthen resilience (Box 2.4). Countries that have limited productive knowledge tend to suffer longer and deeper recessions (Hausmann and Hidalgo, 2010^[14]). Also, exports of more complex products tend to last longer (see below). Sixty-five new products were added to Latvia's export basket from 2003 to 2018, contributing an estimated USD 952 in income per capita in 2018 (Atlas of Economic Complexity, 2021^[15]). Still, the corresponding contributions of new products in Lithuania (USD 1080) and Estonia (USD 1280) were larger.

Box 2.4. The Economic Complexity Index

The Harvard Growth Lab's Economic Complexity Index (ECI) is based on the concept of productive knowledge – or the tacit ability to produce a product. Countries that are home to a great deal of productive knowledge, particularly complex specialised knowledge, are able to produce a broad range of sophisticated products. Determining a country's economic complexity depends not only on the absolute number of products that it produces, but also on the ubiquity of those products (the number of countries that export the product) and the sophistication and diversity of products those other countries produce.

The complexity of a country's exports is found to accurately predict current income levels. The initial level of the ECI was found to be a significant and positive determinant of subsequent GDP per capita growth, controlling for human capital, natural resource exports and convergence effects through the initial level of GDP per capita (Araujo, Chalaux and Haugh, 2018^[7]). Therefore, growth can be driven by a process of diversifying knowhow to produce a broader and increasingly complex set of goods and services.

Latvia's position in the Economic Complexity Index has remained relatively stable over the last decade (Figure 2.13). In 2018, many of its goods exports were classified as low-complexity products, such as basic wood products, food and metal processing (Figure 2.14). Low-complexity products that experienced slow export growth from 2008 to 2018 include but are not limited to: mineral fuels, oils and waxes, and fertiliser. Conversely, electrical and industrial machinery, which are high-complexity products, experienced rapid export growth.

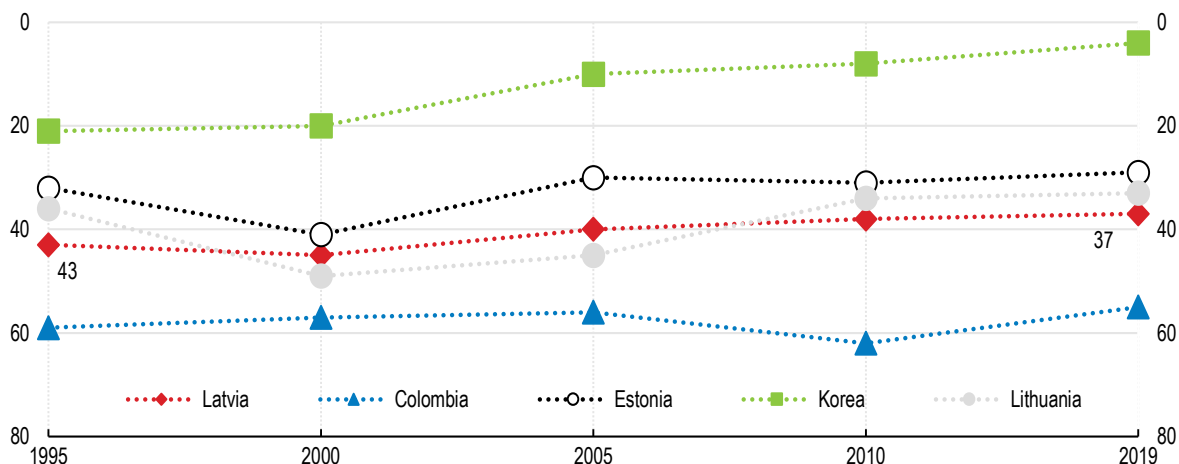
Revealed comparative advantage analysis shows that the range of products in which Latvian manufacturers specialise has broadened (Figure 2.15), and the quality of its exports (as proxied by prices relative to global averages) has improved (Figure 2.16). The increase in the number of products in which Latvia enjoys a comparative advantage is similar to developments in Lithuania, Estonia and the southern European periphery countries. However, Latvian manufacturers did not move into the fastest growing markets that bring larger gains in export performance (Araujo, Chalaux and Haugh, 2018^[7]) and still rely on low labour costs rather than on innovation.

The likelihood of firms introducing new products can be predicted through their specific characteristics. Every year about 40% of existing Latvian exporters add a new product to their export basket, a figure that has remained relatively stable over time. In two-thirds of these cases the firm introduces more than one product. Incumbent exporters tend to penetrate new markets with more complex products. Nonetheless, when incumbent exporters introduce a new product, they tend to do so with a smaller value than new exporters. Younger, larger, foreign-owned and more productive firms have a higher likelihood to introduce a new export product, as well as firms with a high share of re-exports, those already exporting towards many destinations and those with a large share of employees under 35. In contrast, participating in EU-financed programmes aiming at either increasing integration with external markets or introducing new

products and technologies has not been found to directly boost exports significantly (Benkovskis, Tkacevs and Yashiro, 2018_[16]).

Figure 2.13. Latvia's exports' complexity has remained limited

Economic Complexity Index (ECI) ranking over 133 countries, from 1 (most complex) to 133 (least complex)

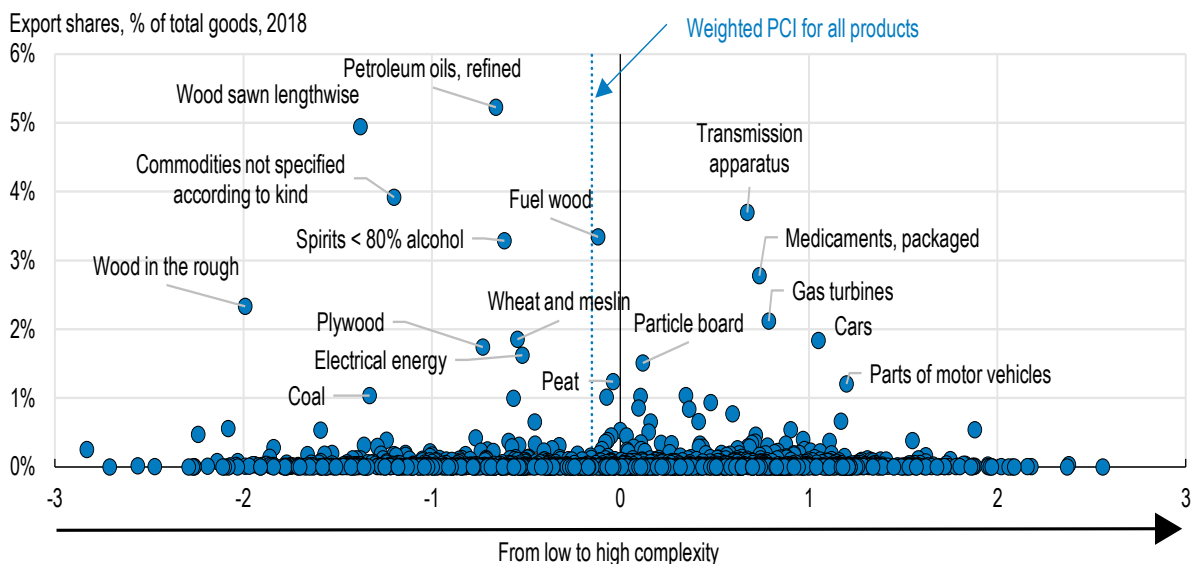


Note: The Economic Complexity Index is a ranking of countries based on the diversity and complexity of their export basket. High complexity countries are home to a range of sophisticated, specialised capabilities and are therefore able to produce a highly diversified set of complex products. The mathematical formula for calculating economic complexity can be found at <https://atlas.cid.harvard.edu/glossary>. Source: The Atlas of Economic Complexity, Harvard Growth Lab. <https://atlas.cid.harvard.edu/>

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Figure 2.14. Latvia exports many low-complexity products

Product Complexity Index (PCI)

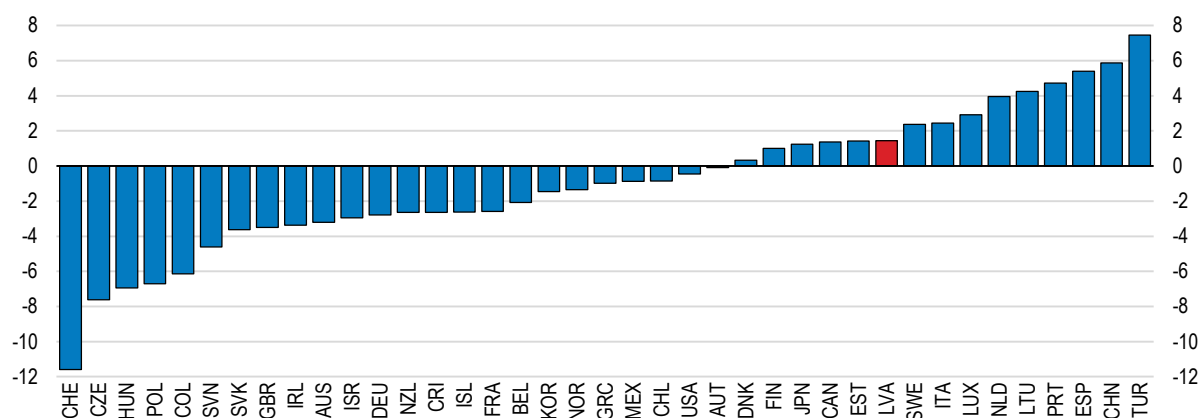


Note: PCI is calculated based on how many other countries can produce the product and the economic complexity of those countries. Source: The Atlas of Economic Complexity, Harvard Growth Lab. <https://atlas.cid.harvard.edu/>

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Figure 2.15. The number of products in which Latvia specialises has broadened

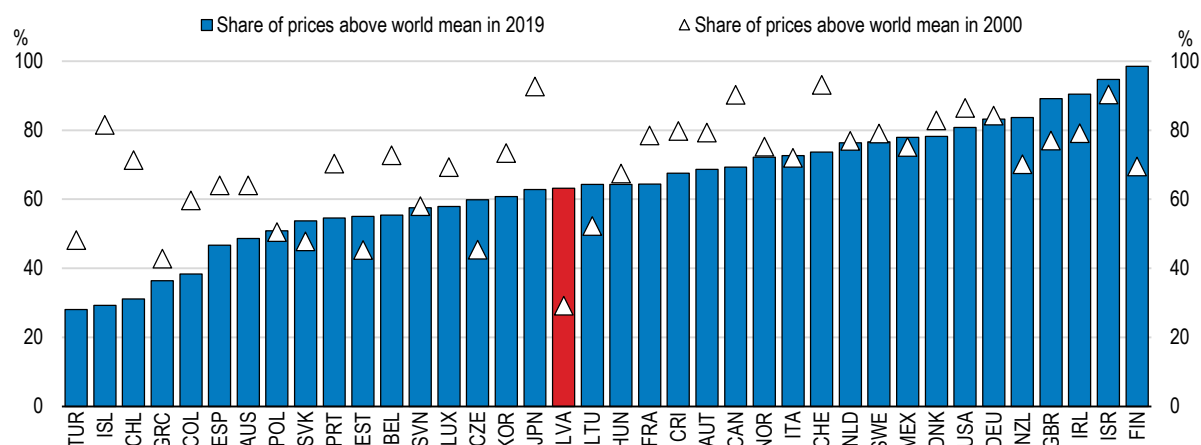
2000-2019 change in the share of products with a revealed comparative advantage greater than zero, %



Note: the share of products with a revealed comparative advantage relative to the total number of products exported by each country. A country has a revealed comparative advantage when the export share of a product in its export basket is higher than the corresponding share of this product in world exports. The figures are calculated using the six-digit Harmonised System product level that comprises 4350 different products. Source: OECD calculations as described in (Araujo, Chalaux and Haugh, 2018^[7]).

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Figure 2.16. The quality of exported products has improved substantially since 2000



Source: OECD calculations as described in (Araujo, Chalaux and Haugh, 2018^[7]).

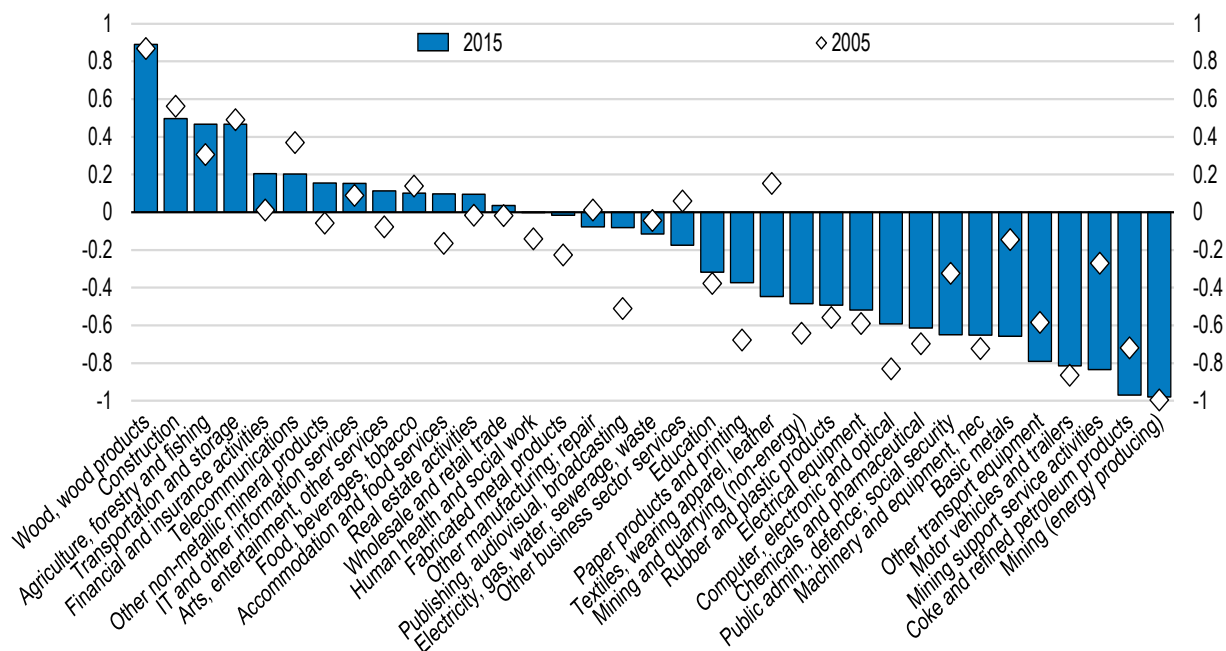
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Along with the reallocation of capital and workers, upgrading production in traditional industries where Latvia has a comparative advantage through innovation activities is needed to increase productivity growth. Latvia's position according to the Economic Complexity Index suggests that existing knowhow offers firms many opportunities to diversify into related products. For example, exports of wood and its products, which constitute about 20% of total exports, grew relatively fast until 2015, revealing a clear comparative advantage (Figure 2.17). Taken together with the absolute advantage of having vast amounts of forested land, this suggests a high potential for future growth. However, due to foreign competition and the rise in labour costs and in automation, traditional wood-product manufacturers will find it difficult to compete without moving up the value chain and producing more complex products. Signs of positive dynamics are emerging, as new technologies help transform raw materials into exportable products. For example, in recent research collaboration the Forest Sector Competence Centre, the Latvian State Institute of Wood

Chemistry and the privately owned company Latvians Finieris have developed a new process to obtain betulin on an industrial scale. Unrefined betulin is used in cosmetics, and by-products of the process to obtain betulin can be used to replace formaldehyde as a glue for wood composites or as mineral fertilisers (OECD, 2021^[17]).

Figure 2.17. In 2015 Latvia had a comparative advantage in the wood-products sector

Latvia's revealed comparative advantage



Note: Revealed comparative advantage (RCA) of exports in value added terms. The calculation in value added terms takes into account GVC linkages. In particular, exports of a given sector are considered irrespective of whether they are directly exported or embodied in the exports of downstream sectors. See (Miroudot and Cadestini, 2017^[18]) for details. The RCA in the figure is normalised to [-1;1].

Source: OECD (2021), *Going Digital in Latvia*, OECD Reviews of Digital Transformation, OECD Publishing, Paris, <https://doi.org/10.1787/8eec1828-en>.

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The transition to a greener economy is bringing new export opportunities. In 2018 the environmental economy contributed 2.5% to Latvia's GDP, which is more than in most EU countries; partially due to large and growing exports of products and services that help either protect the environment or preserve the stock of natural resources (such as renewable energy) (Eurostat, 2021^[19]). Nonetheless, labour productivity in environmentally friendly sectors is low, as in the economy as a whole. Latvia spends a relatively large amount of its government R&D budget on environment and energy-related research. Still, the weak innovation capabilities in academia and the business sector (see below) are a drag on the environmental economy.

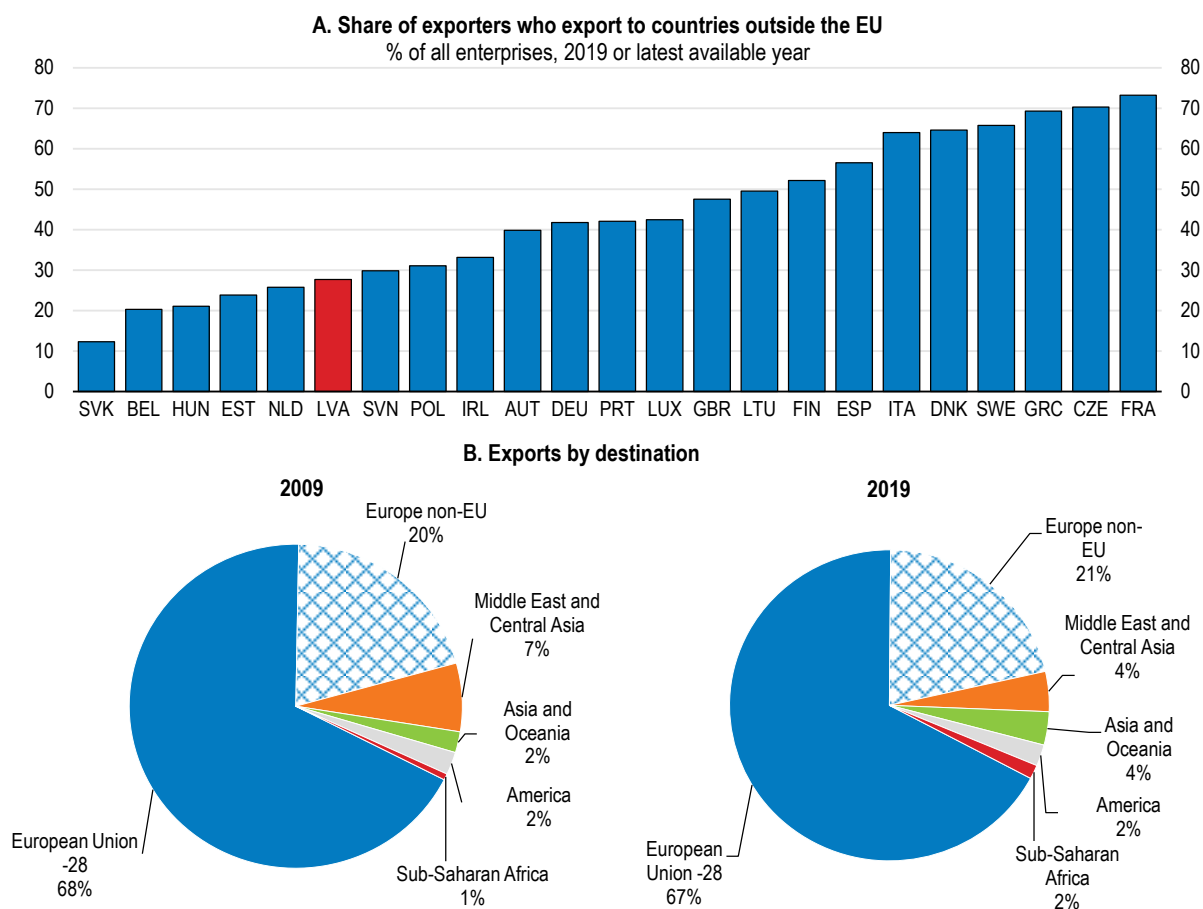
With the global economy recovering and the Covid-19 pandemic containment measures eased, the tourism sector is expected to recover gradually. Before the pandemic hit, Latvia was an emerging tourism destination thanks to its many natural resources and rich cultural heritage. Tourism exports were about 5% of total exports and 17% of service exports while providing 77100 jobs, 8.5% of total employment. The number of hotels and other accommodations grew significantly, with a large increase in the number of hostels. The majority of inbound visitors stayed in Riga. Nevertheless, the sector has experienced some challenges: the average daily spend per tourist is low compared with the EU average and Estonia, acute seasonality negatively affected business turnover, especially in the accommodation sector (the average

occupancy rate in the low season dropped to as little as 30%), and there is a need to reduce the shadow economy in the sector. Latvia has justifiably set the Meetings, Incentives, Conferences and Exhibitions (MICE) and the wellness/health tourism markets as key priorities to minimise the effects of seasonality (OECD, 2020_[20]). To improve service quality standards, a focus on improving the education and skills of service providers is another priority. Therefore, enhancing training and life-long learning (see below) could be crucial to the growth of this sector in particular.

Expanding exports to new markets

Latvia should look into expanding exports to new markets, given the weakening demand from the country’s current main export markets. Latvian firms usually start exporting to the European Union, as it is a proven gateway with fewer regulations. However, the share of exporters exporting outside Europe is small (Figure 2.18), and in general, Latvia’s export destination composition has hardly changed since 2009. For example, only about 1% of exports of goods and services are to China, much below most EU countries’ share. Latvia’s main export markets are Lithuania, Estonia, Russia, Germany, Sweden and the United Kingdom. The OECD is projecting potential GDP of these six economies to increase by only about 1.9% a year in the years 2021-2023, compared with, for example, 5.2% in China and 5.4% in India.

Figure 2.18. Exports outside Europe are small



Source: OECD Trade by Enterprise Characteristics database; IMF, DOTS database.

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Support for companies trying to enter distant markets helps spread the risk of relying too much on a few markets and can pave the way for future exporters. Firms trying to enter distant markets face unique challenges. Aside from regulatory barriers, sometimes they must tailor their products for different consumer preferences. In these cases entry barriers are larger than usual and limit opportunities to increase exports. The foreign representative offices of the Investment and Development Agency of Latvia (LIAA) help to link Latvian entrepreneurs to buyers in 18 countries including crucial GVC hubs like the United States, Japan and China. Still, more resources should be allocated to help firms enter distant markets. In addition, the public development finance agency ALTUM provides export-credit guarantees that cover commercial and political risks for up to two years, thus lowering risks for exporters. However, much of the money is used to support exports to other former Soviet Union countries like Belarus, Ukraine and Russia that traditionally imported from Latvia due to its proximity. Therefore, the benefits of these guarantees are limited. Prioritising support for firms entering distant markets in future support expansions would help to diversify Latvia's export basket and increase the return on this government assistance.

Export promotion activities could help Latvian firms take more risks when trying to penetrate foreign markets with more complex products or exporting to new destinations. In Denmark export promotion activities by a government agency facilitate entry into export markets and the continuation of export activity, especially for small firms, and the benefits have been shown to greatly outweigh the costs (Munch and Schaur, 2018^[21]). Small firms face entry barriers on foreign markets, which require an upfront investment to learn about market conditions, identify distribution channels and search for foreign partners. Hence, export promotion activities can improve the performance of smaller firms to a greater extent than their larger counterparts.

Sustaining exports through increasing product complexity

Factors that have been found to increase exports' survival are as follows: entering foreign markets with products experiencing strong world demand; high labour productivity and profitability before entering the foreign markets; introducing a product that is similar to products within the existing export basket of the firm; and exporting more complex products. However, switching to exporting more complex products can be challenging. In the case of firms that are already exporting, introducing a more complex product reduces survival rates. Exporters of food, chemicals and pharmaceuticals tend to survive longer than exporters from other industries (Benkovskis et al., forthcoming^[13]).

Upgrading the skills of exporters' employees and knowledge about export markets would help Latvia ensure the continuity of trading relationships and progress towards exporting more complex products with greater technical requirements. Latvian firms with a larger share of young employees enjoy higher survival on the external market. This could be seen as an indication of the importance of skills and knowledge, which in Latvia's case are more plentiful in younger cohorts. As the share of small firms in Latvia is large, pooling resources and building a community of managers who learn from one another (see also below) can help to sustain exports. In Switzerland, for example, a non-profit private association relying on a network of national and global partners support Swiss firms, SMEs in particular, in identifying and exploiting market opportunities abroad and helping innovative foreign companies establish themselves in Switzerland. The association (Switzerland Global Enterprise) provides information about international market developments, professional workshops and legal clarifications. In addition, it acts as a broker for business contacts and creates awareness of Swiss products and services abroad (Switzerland Global Enterprise, 2020^[22]).

Diversifying the supplier base to improve resilience

Although value chains have continued to operate during the COVID-19 crisis, disruptions have reignited the debate on the risks associated with the reliance on foreign suppliers and international production networks. Improving the robustness and resilience of value chains can be achieved by diversifying the

supplier base and using better risk-management strategies at the firm level. Multinational enterprises often develop control towers that give real-time information, which allows for efficient management of risks (Miroudot, 2020^[23]). However, for small firms, gathering and analysing the relevant information may be excessively costly. Authorities and employer associations can support firms' preparation for the next possible crisis by collecting and sharing information on potential bottlenecks, by developing stress tests and emergency planning for essential supply chains and by promoting the use of digital technologies to improve information systems for risk management (OECD, 2020^[24]) (OECD, 2021^[25]).

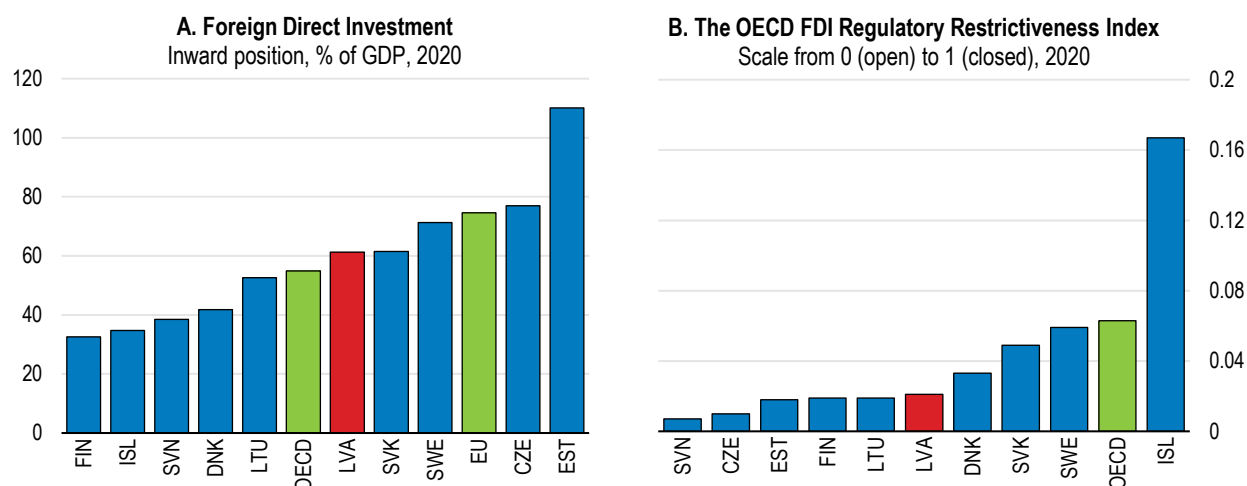
Latvia is in an excellent position to make the necessary structural changes, as considerable EU funding is available (Chapter 1). To promote export growth and diversification it should focus mainly on three policy areas: the business environment and infrastructure, skills and innovation.

Improving the business environment and infrastructure

Maintaining efforts to improve market regulations for all firms

Policies to improve product-market competition and the business environment that will attract FDI would help Latvia to increase backward GVC participation from its current low base. Inward FDI is an important determinant of backward participation in GVCs (Kowalski et al., 2015^[26]). Overall, statutory restrictions on FDI in Latvia are low (Figure 2.19), and its attractiveness is supported by an efficient customs system (European Commission, 2020^[27]) and laws and regulations that are easy to access and understand (Vitale et al., 2020^[28]). Latvia is also among the best performers in the OECD Services Trade Restrictiveness Index. Moreover, as in other Eastern European countries, corporate taxation – both the effective average tax rate and revenues as a share of GDP – is low. Still, room for improvement exists.

Figure 2.19. FDI inward position is high, while FDI Regulatory Restrictiveness is low



Note: The inward FDI stock is the value of foreign investors' equity in and net loans to enterprises resident in the reporting economy.
Source: OECD International Direct Investment Statistics database; OECD FDI Regulatory Restrictiveness Index database.

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Latvia's score in Transparency International's Corruption Perceptions Index has gradually increased in recent years but still lags behind most OECD countries (Chapter 1). The establishment of the new Economic Court in 2021 will help improve legal procedures, reduce the time spent in court and change perceptions regarding corruption. To improve the knowledge of judges regarding economic issues and financial crimes, the dedicated training for staff working in economic courts should continue. Establishing a state training centre, as planned, will help ensure the uniformity of training. Additionally, as mentioned in the 2019 *Economic Survey*, a strong engagement with the diaspora can alert emigrants to opportunities to invest, do business and help promote Latvia as a destination for foreign investment (OECD, 2019^[2]). In 2021 the government approved a strategic plan for strengthening the relations with the diaspora, which includes concrete actions to foster relations with entrepreneurs and researchers.

In order to level the playing field, Latvia should maintain efforts to reduce the bureaucratic costs of doing business and improve market regulations for all firms. In 2021 it introduced a fast-track Green Corridor for investment in priority industries that are part of the Smart Specialisation Plan (ICT, bio-economics, smart materials, photonics, biomedicine and smart energy), as well as in Global Business Services centres and in strategic projects that are carried out by other sectors. Almost all administrative procedures related to opening and running a business are being simplified for the chosen projects – including receiving construction permits, getting work permits for foreign workers, renting or acquiring state-owned real estate and benefiting from state-supported training programmes. This fast-track is open to both local and foreign companies. Reducing administrative barriers is welcome; however, policy should aim to optimise regulation regardless of industry.

Latvia has undertaken several important reforms to improve its insolvency framework (OECD, 2019^[2]) (IMF, 2021^[29]). Still, the debt recovery rate is low, which makes loans to businesses issued in Latvia riskier than in most euro area countries. Based on data from four Eastern European countries, including Latvia, the IMF found that an increase in the recovery rate by 10 percentage points is associated with an increase of annual total factor productivity growth by 0.4 percentage point (IMF, 2019^[30]). Economies where reorganisation is the most common insolvency proceeding also have the highest recovery rates. The purpose of reorganisation is to allow the debtor to overcome its financial difficulties and resume business operations. However, currently the Legal Protection Proceedings, the main instrument of formal insolvency-related procedures for reorganisation, do not seem to fulfil that function. The number of cases where a plan for reorganisation is concluded is limited, suggesting that in many cases the procedure is used just as a delaying tactic against creditor action. Promoting creditor participation and rights could increase the share of reorganisation among insolvency procedures. For example, Latvia could change the framework that allows a creditor to file for insolvency of the debtor, but only for the purposes of liquidation (World Bank, 2021^[31]); although this possibility risks creating a favourable environment for bad-faith creditors. In addition, Latvia should continue implementing the EU restructuring directive and simplify debt reorganisation through out-of-court and hybrid reorganisation procedures (IMF, 2021^[29]). Having a well-functioning legal framework can act as a catalyst for contract-based restructuring, which is important, given the large share of out-of-court procedures and their low costs (EBRD and PwC Latvia, 2020^[32]).

Competition has recently moved up the policy agenda. The Competition Council gained 64% in added resources in 2021 (including a rise in the number of posts from 50 to 56) and more salary flexibility to improve its hiring and reduce staff turnover. It is expected to be made financially independent from the Ministry of Economics. Its enforcement powers are being enhanced by implementing the European Union's recent ECN+ Directive, including competitive neutrality (preventing distortions caused by public administrative bodies and disallowing competition restrictions in public procurements), in force since 2020.

While the micro-enterprise tax regime is rightly being restricted, the development of a technology-oriented start-up ecosystem in Latvia has been promising since the relevant legislation was implemented in 2017 (and amended in 2020). The administrative requirements imposed on new firms are among the lowest in the OECD (Vitale et al., 2020^[28]), and start-ups are allowed a special advantageous regime for social insurance contributions, zero personal taxes, wage subsidies for highly qualified employees and taxation of stock options only at realisation (and then only at a rate of 23%). However, the value of the state aid involved cannot exceed EUR 200000 per case in any three-year period according to EU *de minimis* rules. From 2017 to 2021 75 applications have been approved for a total amount of EUR 350 million within the framework of state aid for start-ups, with an increase in the number of applications in 2021 (50 new companies have applied). A systematic review of the main barriers is needed as well as improving communication regarding all support measures available for start-ups.

Strengthening SOEs governance to improve their effectiveness

The scope of state-owned enterprises (SOEs) in Latvia is among the largest in the OECD. They account for 13% of total enterprise assets, about 6% of turnover and 5% of employment. SOEs tend to dominate the energy and transport sectors but also feature heavily in other sectors, such as construction. Some SOEs have diverse and often strategic collaborations with selected research and higher education institutions. Nonetheless, SOEs' R&D spending is low (Cross-Sectoral Coordination Centre, 2020^[33]), similar to private firms (see below). In line with OECD best practice, Latvia regularly assesses the rationale for state ownership, and by implication whether individual SOEs should be privatised. Selling SOEs to private investors should occur when the rationale for state ownership is no longer fulfilled. However, the privatisation of wholly owned SOEs has almost come to a halt (OECD, 2019^[34]), and no further full privatisation of any of the 67 SOEs is planned, despite the high costs involved with having such a broad scope for their coverage (Masuch et al., 2018^[35]), as indicated by the OECD Product Market Regulation indicators for 2018. Likewise, the use of capital markets to attract investors is limited.

Currently, 11 ministries, one public institution and one SOE (Public Asset Manager Possessor) manage SOEs, with a coordination function housed in the Prime Minister Office's Cross-Sectoral Coordination Centre (CSCC). The Cabinet of Ministers sets strategic objectives, while the capital-shareholding ministries and supervisory boards set annual financial and non-financial objectives (OECD, 2018^[36]). Nonetheless, room for improvement exists in terms of target setting and monitoring SOEs' performance. For example, there is no unified standard in terms of transparency and accountability regarding the performance of SOEs, and targets are often set below past performance levels (KPMG Baltics, 2019^[37]). Centralisation of all SOEs into a single holding entity – in line with the 2015 OECD Guidelines on Corporate Governance of State-Owned Enterprises (OECD, 2015^[38]) – could help clarify their objectives and lead them to have a more active role regarding innovation activities (Gasparin et al., 2021^[39]), for instance by investing in risky and innovative projects related to the green transition and digital transformation. Additionally, it could help monitor performance and ensure the ownership of SOEs is entirely separated from the state's other roles as regulator and policy maker. This entity could be either a specialised ownership company or a designated government ministry. In Finland, for example, the Ownership Steering Department in the Prime Minister's Office is responsible for state ownership policy (OECD, 2018^[36]). In Korea the institute responsible for exercising the ownership function rewards SOE employees and CEOs according to the enterprise's innovation performance (OECD-Asia Network on Corporate Governance of SOEs, 2020^[40]). Introducing classification of SOEs into groups according to their objectives could be a stepping stone towards a centralised ownership model (KPMG Baltics, 2019^[37]).

The government acknowledges the role of state-owned enterprises in boosting business R&D and innovation (see below). Accordingly, a new initiative is planned – a Shareholder’s Expectation Letter – to clearly communicate the direction of state-owned enterprises towards investment in R&D and innovation.

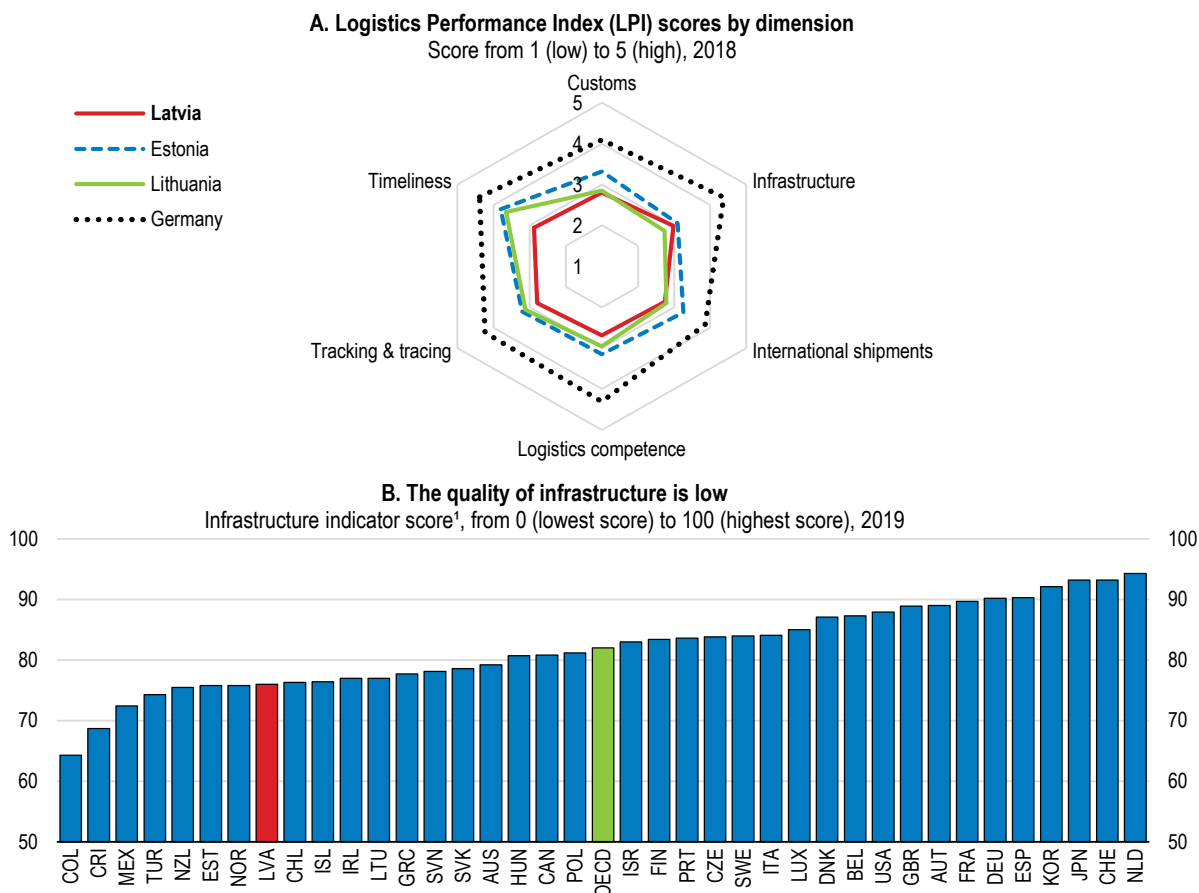
Improving connectivity through better public transport

Efficient domestic markets for services are needed to underpin participation in GVCs and attract FDI. Global production networks rely on well-functioning transport, logistics, communication and other business services to move goods and coordinate production (OECD, 2015^[9]). However, according to the practical experience of logistics professionals, Latvia’s logistics performance lags behind its peers (Figure 2.20, Panel A). The quality of logistics services, the ability to track and trace consignments and the frequency with which shipments reach consignees on schedule are poor (World Bank, 2018^[41]). On the other hand, Latvia is performing well in deploying high-speed broadband networks, although differences in connectivity persist between urban and rural areas. There are also concerns about competition in the fixed broadband market, where the incumbent’s share is about 55%, compared with 40% in the European Union on average (OECD, 2021^[17]).

The quality of overall infrastructure, as perceived by Latvian business leaders, has much room for improvement (Figure 2.20, Panel B). The Rail Baltica project will upgrade the public transport system and integrate the Baltic States with the European rail network. On the other hand, electrification of the current train lines is low (OECD, 2019^[2]), contributing to avoidable emissions. Nonetheless, due to the fall in freight traffic, the national railway company cancelled at the beginning of 2020 its previously planned projects to electrify the country’s railway network. New discussions are underway to consider implementing electrification using EU funds.

Despite recent progress, the quality of road infrastructure in the country is well below the EU average (European Commission, 2020^[42]). Most roads are single lane. Road mortality is among the highest in the OECD (OECD, 2019^[43]). The extensive length of the Latvian road network relative to its small population makes it difficult to maintain road quality (LV PEAK, 2020^[8]). Therefore, the selection of new infrastructure projects should be conducted carefully, prioritising roads with high traffic intensity. As mentioned in the 2019 *Economic Survey*, multiple-lane roads connecting the largest regional cities to Riga and capitals of neighbouring countries would help promote tourism, trade and safety (OECD, 2019^[2]). The national road development strategy for the years 2020-2040 aims to make Riga more accessible by creating a main road network that would allow reaching the outskirts of Riga from all other major cities within two hours. In this plan about 1000 kilometres of main roads are earmarked for an upgrade (currently, the total length of main roads is about 1700 km). Although most of the construction works will take place after 2035, reconstruction of roads is planned already in the period 2020-2030 within available limited financial resources. The large amount of planned investments highlights the need for efficient project selection. Applying the same evaluation procedures to guide the selection of transport projects funded by the state budget as used for EU-funded projects would help ensure high-quality investments in the road network (OECD, 2017^[1]).

Figure 2.20. The quality of infrastructure is low, and logistics performance lags behind peers



1. The Infrastructure indicator of the Global Competitiveness Index 4.0 assesses the quality and extension of transport infrastructure (road, rail, water and air) and utility infrastructure (electricity and water).

Source: World Economic Forum, *The Global Competitiveness Report 2019*, http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf; World Bank, *The Logistics Performance Index 2018*, <https://lpi.worldbank.org/>.

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Improving connectivity with Riga, particularly by public transport, should remain a key priority. In 2019 more than half of employed people in Latvia travelled more than 30 minutes from home to work, which is the highest share in the European Union. The trend towards low-density development in the suburbs and the concentration of high-wage jobs in Riga city help to explain this outcome (OECD, 2017^[1]). Long commuting times and low residential mobility (Chapter 1) contribute to skills mismatch by making it more difficult for Latvian firms to find skilled workers who themselves struggle to reach better jobs. Reducing skills mismatches could significantly improve productivity (McGowan and Andrews, 2015^[44]) and export performance in Latvia, given the fast recovery in job vacancies and the shrinking population. As more than 60% of job vacancies are in the Riga region, reducing commuting time to Riga is crucial.

Although lower than in other European cities, congestion around Riga is noticeable – especially on the bypass roads (A4 and A5) – resulting in unpredictable traffic flow and an increase in pollution. Setting up transport hubs in Pieriga, with the possibility of leaving one's private vehicle in a car park and changing to public transport, would promote the use of railways, improve connectivity with Riga city and probably reduce overall emissions in the transport sector. To conduct such projects effectively coordination between Riga and municipalities in Pieriga region has to be improved. Establishing a metropolitan transit authority,

as in Paris, Barcelona and Rotterdam could help to prioritise investments, facilitate decision-making regarding regional linkages and promote common pricing systems, which make public transport more attractive. A metropolitan transit authority would also help redesign the transport system in line with sustainability principles. Authorities plan to introduce a single ticket for public transport and a real-time passenger information system by the end of 2023. Moreover, using RRF funds, they plan to upgrade five out of the 13 multimodal transport corridors in the Riga metropolitan area by 2026. A congestion-pricing mechanism should be considered as an additional lever to minimise the use of private cars and improve public transport infrastructures. For example, Latvia could create more dedicated bus lanes (DBL) and allow private cars to use them if they pay a toll. Revenues can be allocated to public transport investments. This approach may enable some of the benefits of a pricing mechanism in travel demand to be attained without vocal public and political opposition (Cohen-Blankshtain, Bar-Gera and Shiftan, 2020^[45]).

Improving skills to enhance export performance

Much is being done to overcome the shortcomings of the education system

A vital condition for boosting exports is a sufficiently large pool of workers with a high level of education and skills. Nonetheless, the most frequently cited long-term barrier for investment in Latvia is the availability of skilled staff. In 2020 88% of Latvian firms considered the availability of skilled staff as a major obstacle, compared with 73% in the European Union overall (EIB Group, 2020^[46]). Skills development begins with the education system. In early-childhood education Latvia performs admirably, with a mix of private and municipal pre-schools, enrolment of around 90% of three year-old children and a long-term objective to pay teachers the same hourly rate as those in primary and secondary schools, which should ensure that quality is high. Curricula at all levels of compulsory education are being reformed starting in 2019-20, with increased focus on transversal skills, digital and ICT skills, as well as competence in key subject areas, such as STEM and foreign languages. For the primary and secondary education system, greater school autonomy is being offered, an additional interdisciplinary standardised matriculation exam is being implemented for lower-secondary graduates, and upper-secondary schools are being consolidated, while the number of subjects is being cut to 13. Overall, Latvian 15 year-olds did quite well in PISA 2018 in mathematics but remain below average in sciences and reading and notably well behind their Estonian neighbours.

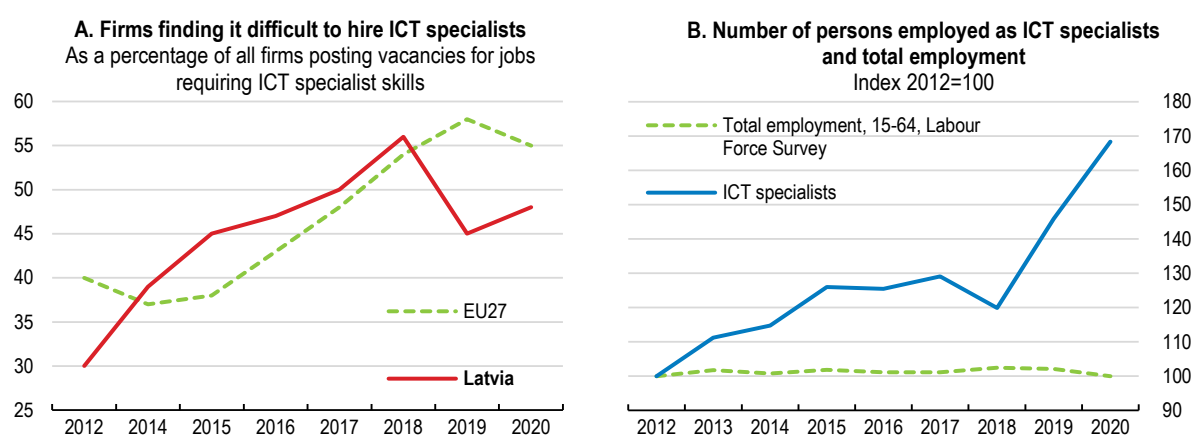
Teachers are benefiting from substantial salary increases so long as quality is maintained: starting in 2022, their target salary will be 900 euros per month based on an assumed 30-hour week. International comparisons show fewer annual hours of compulsory instruction time for Latvian children than in almost all other OECD countries at primary and lower-secondary levels: the shortfall from the average in 2019 was over 25% in primary education and about 14% for lower-secondary pupils. Funding will become more decentralised. In contrast with the current state, henceforth funding for teachers' payments will be transferred to local municipalities and then redistributed to individual schools in accordance with quality targets. For the moment there is no significant scarcity of teachers, but a problem of shortages in the sciences is predicted for around 2030 (see below).

The Recovery and Resilience Fund and other EU structural funds will provide increased funding and promote structural changes in the higher education system, including mergers of higher education institutions. A new funding model is being implemented along with new governing boards. Individual universities are to develop their own strategies and areas of specialisation, and the academic career model is being reformed. Judging by the ample labour-market returns to tertiary education the system has been performing well in providing graduates with relevant skills – graduate tracking has been underway for a couple of cohorts and shows that recent graduates begin their careers with incomes already substantially above average levels (about 23% above in the first year and 37% in the second) – although high returns also signify a lack of supply of graduates relative to demand.

A shortage in ICT and STEM skills has become an increasingly important constraint

Tackling ICT and STEM skills shortages remains a major challenge. Highly qualified employees are crucial for the continuing development of the ICT sector and for increasing business R&D and the future supply of researchers (see below). The share of ICT specialists in employment (3.1% in 2019) is low (about half of that in Estonia, for example), while the share of firms encountering difficulties in filling ICT vacancies increased at a slower pace than in the EU average (Figure 2.21, Panel A). Nevertheless, the number of ICT vacancies is high, the number of ICT specialists is rising much faster than total employment (Panel B), and digitalisation of non-ICT firms is boosting demand for ICT specialists. According to the Ministry of Economics' medium- and long-term labour-market forecasts, the shortage of highly qualified specialists in STEM disciplines may increase to 14000 by 2027, which is five times the current annual number of graduates with the relevant qualifications.

Figure 2.21. The number of ICT specialists is rising



Source: Eurostat.

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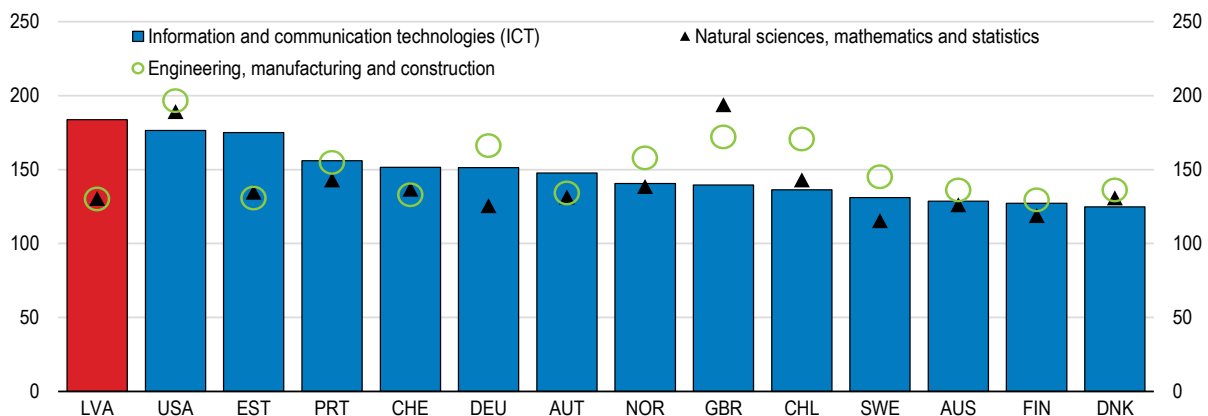
The most severe shortage seems to be for tertiary-educated ICT graduates (such as in computer science). ICT graduates enjoy a high wage premium (Figure 2.22), indicating a substantial demand for their skills, but there is a limited supply. The share of young adults with ICT (and STEM) degrees is below the OECD average, as well as those in Estonia and Lithuania. Latvia has introduced policies to increase the number of STEM students; in particular, the government shifted state-funded higher education places from the social sciences to STEM subjects. Therefore, about 80% of STEM students do not pay tuition fees, unlike in social sciences, where about 85% of students do so. These efforts appear to be bearing fruit. The share of ICT graduates in the total increased from 3% in 2013 to 4.6% in 2018, although it is still lagging leading countries such as Estonia (6.1%) and Finland (7%) (OECD, 2020^[47]). This increase did not come at the expense of other STEM fields.

Nonetheless, the absolute number of STEM graduates has decreased, in part as a consequence of a shrinking youth population (Chapter 1) but mainly due to high dropout rates. While the number of new entrants (at all levels of tertiary education) in natural sciences, mathematics and information technologies increased by 18% from 2013 to 2020, the number of graduates decreased by 26%. In Latvia high dropout rates exist across all fields of study (OECD, 2019^[48]) but are most severe in ICT. In 2020 the ratio of graduates to new bachelors students in natural sciences, mathematics and information technologies was only 26%, compared with 35% in engineering and 46% in total. Many students drop out in their first year and even within the first semester of their studies (Paura and Arhipova, 2016^[49]), suggesting that poor teaching, mentoring and matching between students and their field of study play a significant role, along with an inadequate preparation of secondary students for tertiary ICT courses. Encouraging higher

education institutions to work towards decreasing dropout rates by providing financial incentives to the institutions – while ensuring this measure does not lead to stricter admission requirements – could help to boost the number of graduates. In Israel, for example, funding of higher education institutions depends on the number of graduates. To tackle shortages of ICT graduates in Israel, financial incentives for higher education institutions to accept extra ICT students were enhanced in recent years, and the number of ICT students and graduates increased as a result. This approach leaves the decision regarding the optimal measures to implement to the institutions. For example, some could invest more in student support measures such as preparatory courses or student tutoring, while others could invest more in improving pedagogy. Additionally, Latvia should raise awareness of the importance of careers guidance among university management teams, as was recommended in the OECD Skills Strategy report (OECD, 2019^[50]), and better align education guidance provided in secondary schools and careers guidance offered in higher education. Careers guidance for students would help Latvia to decrease dropouts and reduce the relatively large skills mismatch (OECD, 2019^[2]).

Figure 2.22. ICT graduates enjoy a very high wage premium in Latvia's labour market

Relative earnings of STEM graduates, Education graduates = 100, 2017



Notes: Data refer to the field of study at the bachelor's level. For Latvia, the calculation is based on net income.

Source: OECD (2019), *Education at a Glance 2019: OECD Indicators*, <https://doi.org/10.1787/f8d7880d-en>

StatLink  <https://stat.link/8pfncz>

Another way to tackle this shortage is to provide students from related fields with information on labour market opportunities, should they add ICT courses to their studies. For example, relying on data from four US states, an OECD study showed that for certain ICT occupations, employers consider tertiary graduates with certain ICT skills from the fields of engineering, business management, marketing and related support services as adequate substitutes to an ICT degree (Brüning and Mangeol, 2020^[51]). Graduates from these fields may thus wish to acquire the relevant skills through additional courses, including online courses, during their studies or after graduation.

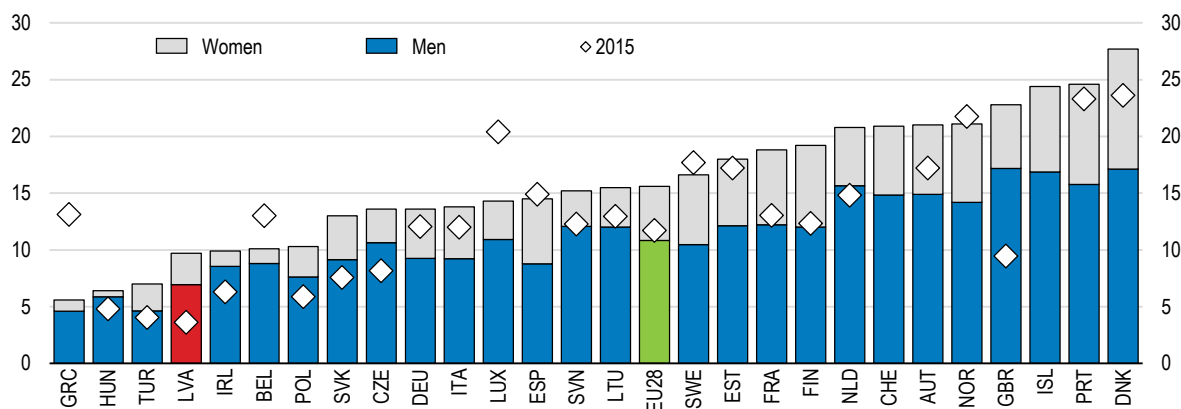
While women account for a large portion of the student population, they choose less often to study STEM subjects. Already in 2018 64% of higher education graduates in Latvia were women, the largest share in the OECD. Differences in preferences start at an early age. At 15 years of age only 0.5% of girls in Latvia wish to become ICT professionals, compared with 9.3% of boys. Making female role models more visible, fighting gender stereotypes in careers guidance and providing girls with mentoring and opportunities to interact with technology at earlier stages could help change gender-specific perceptions about ICT careers (OECD, 2019^[52]). In 2016 Riga Tech Girls was founded to encourage girls and women to develop digital skills and to establish a professional network of women in the ICT sector. Such initiatives should continue and focus on programmes for young girls. For example, a one-hour intervention in French secondary

schools by female scientists has increased girls' enrolment in the most selective and math-intensive STEM fields of study at university (such as computer science) by 20 to 30% (Breda et al., 2021^[53]). As ICT occupations often offer greater flexibility in working hours and many opportunities to telework, the gender pay gap among these occupations is generally relatively small (Goldin, 2014^[54]). Therefore, a change in gender-specific perceptions could also help reduce the total gender pay gap, which is wide in Latvia (Chapter 1).

The share of young adults who can programme is low, even though it has progressed significantly since 2015 (Figure 2.23). Latvia is currently reforming its national curriculum to give computational thinking higher priority. The new curriculum aims to develop digital literacy as a transversal skill across all study areas, with the basics of coding taught from primary school. However, given the strong demand for ICT skills in the labour market, attracting and maintaining ICT specialists as teachers may prove difficult. Latvia should allow schools to pay teachers of coding and computing an additional allowance to overcome the expected shortages and supply adequate training for teachers to ensure successful adoption of the new curriculum (OECD, 2021^[17]) (Box 2.5). In addition, Latvia should favour digital solutions that enable the best teachers to reach more students and create partnerships with ICT employers to allow ICT professionals to teach part-time. The latter will help to ensure curricula are labour-market oriented. In the Netherlands a programme of the Dutch National STEM platform (PTvT) increases STEM uptake in secondary education through one-on-one partnerships between more than 100 leading ICT firms and 40% of all Dutch secondary schools, with the objective of providing context to the curriculum (EU STEM Coalition, 2020^[55]). Moreover, to select suitable candidates for teaching and build a pool of skilled teachers, authorities should fully implement an entrance selection criteria and final assessment requirements in teachers education programmes, as recommended by the OECD Skills Strategy report (OECD, 2019^[46]).

Figure 2.23. Few young adults are able to programme

Share of 16-24 year-old individuals who can programme, %, 2019



Source: OECD Going Digital Toolkit. <https://goingdigital.oecd.org/en/indicator/54/>

StatLink  <https://stat.link/dmu56h>

Box 2.5. Policies for the development of teachers' ICT skills

Countries across the OECD have been tackling the need for teacher ICT training through a range of policies, from introducing compulsory training to national accreditation standards or certification for teachers. Denmark, for instance, has developed a voluntary Pedagogical ICT Licence that combines pedagogical knowledge of ICTs and basic ICT skills training. After initial implementation for in-service training, this license was expanded to initial teacher education and general upper-secondary education. While not mandatory, the licence is integrated into the curriculum of teachers who graduate from education colleges (OECD, 2019^[56]).

Teachers' training can take the form of traditional face-to-face or on-line courses. In Spain, France, Slovenia, Sweden and the United Kingdom, courses on digital education tend to progressively develop into on-line training. In France, most of the digital skills training courses are provided on-line, and, since 2014, 362000 teachers have been trained via digital platforms. Self-assessment tools may help teachers evaluate effectiveness and detect areas for improvement. In Finland, teachers can measure and analyse their use of ICT in teaching through an online self-assessment tool. It provides teachers, school and municipalities' representatives information on how their ICT usage compares to others (European Commission, 2019^[57]).

Integrating digital technologies into national testing could encourage teachers (and students) to enhance their ICT skills. In Finland, the national final test for upper secondary education has been gradually digitalised, becoming fully digital in 2019 (European Commission, 2019^[57]). Additionally, Finland created 2500 temporary mentoring positions to assist teachers in using new technologies and to promote using digital environments (European Commission, 2018^[58]).

Source: (OECD, 2019^[56]); (European Commission, 2019^[57]); (European Commission, 2018^[58]) in (OECD, 2020^[59]).

Facilitating the immigration of skilled workers

Encouraging Latvian nationals with an academic degree to return to Latvia would help it to reduce its labour shortages. Since 2018 consultants in regional municipalities have provided Latvians who wish to repatriate with information regarding employment opportunities, housing and education. Enhancing the use of online distance learning could help prepare expatriate children to study in Latvia. A greater potential exists in attracting students who study outside Latvia to return after graduation. Among Latvians who study abroad, about 30% declare that they may return to Latvia under certain circumstances, 15% that they will return for sure and about 55% that they do not intend to return (Kaša, 2019^[60]). Creating a database of Latvian students studying abroad and hosting information meetings in the main destinations, as is done with scientists, could help to reach students contemplating returning. Latvia should consider forgiving student debts or providing grants to international graduates who acquired qualifications for professions with high demand in the labour market.

Attracting talented workers from outside the European Union by loosening restrictions on work-based immigration would be another way to increase the supply of skilled workers and to help alleviate demographic headwinds that are shrinking the working-age population (Chapter 1). It could also boost innovation (Bloom, Van Reenen and Williams, 2019^[61]) and entrepreneurship and aid business and technology exchanges with immigrants' home countries. From a political economy point of view restrictions on work-based immigration reflect relatively negative attitudes towards immigration in general (European Commission, 2018^[62]). However, economically, Latvia would probably benefit from loosening its restrictions, especially for highly qualified workers. Currently, Latvia is among the least attractive OECD countries for talented migrants due primarily to its low income level (Tuccio, 2019^[63]). Still, Latvia's income level is higher than in most non-EU countries, so its attractiveness for workers from such sources is not negligible.

Latvia could be more open to skilled non-EU workers who show interest in immigrating. In 2019 the government approved a simplified procedure for obtaining a work permit on the basis of a long-term visa. In addition, the labour market test, which requires employers to post a job vacancy in order to prove that the position could not be filled domestically, was shortened to 10 working days. Moreover, foreign recruits for highly qualified positions may receive a work permit (EU Blue Card) at a lower salary threshold: 1.2 times the average wage, rather than the previous multiple of 1.5. This is an important step because, relative to other EU countries, the salary threshold made it difficult to qualify for a Blue Card in Latvia. The number of work permits issued to non-EU citizens rose from 4800 in 2015 to more than 12000 in 2020. However, only about 10% of these permits were for jobs with significant labour shortages. To attract highly qualified employees Latvia could engage in more active outreach to potential skilled migrants, such as through migrant centres or jobs fairs abroad, in order to match them with quality jobs in Latvia (OECD, 2019^[50]). Targeted outreach by Latvian employers may help to identify recruits who would not otherwise consider coming to Latvia. One possibility is to participate in EU-subsidised Skills Mobility Programmes. These low-risk programmes have helped Lithuania, for example, establish links with Nigerian firms and training institutions for recruitment of qualified workers for the ICT sector.

Exports of construction services have grown rapidly in the last decade, along with a rapid increase in productivity (LV PEAK, 2020^[8]). However, a shortage of qualified employees risks limiting the ability of the sector to grow further. Firms that export construction services will have to compete with firms operating in the local market for a limited number of qualified workers, while demand for construction services will no doubt increase in both Latvia and other Central and Eastern European countries due to the EU Recovery and Resilience Plan and other EU structural funds. Even before the crisis, a lack of qualified workers was observable (European Commission, 2020^[42]). The Ministry of Economics has introduced preferential conditions to attract highly qualified specialists, such as construction technicians and civil engineers from outside the European Union. The authorities should expand the list of favoured occupations to support public investments and export growth. In addition, they should support adoption of digital technologies that raise labour productivity.

Latvia should also make further efforts to attract foreign students, even if they are already fairly numerous. The US experience suggests that immigrants who first entered on a student visa have a large advantage over natives in wages, patenting and commercialising or licensing patents (Hunt, 2009^[64]). They are also more likely to start companies than natives with similar education. Latvia is making efforts to attract foreign students by improving the English-language skills of the current higher education teaching staff, developing new study programmes in English and attracting foreign teaching staff. However, labour market restrictions limit the effectiveness of these actions, as the State Language Law requires knowledge of Latvian for all occupations “if it is in the public interest” or if the worker must interact with clients directly. In 2019, the government cancelled the labour market test (defined above) for non-EU graduates who have already been employed during their studies, and continuing to work with the same employer. Latvia should relax State Language Law requirements and exempt all university graduates from the labour market test (OECD, 2019^[50]). In recent years access to the national labour market for international graduates was liberalised in the Czech Republic, Estonia, Ireland, Lithuania, Luxembourg, the Slovak Republic and Sweden. In Lithuania requirements regarding work experience and labour market tests were lifted, and in Estonia the (minimum) salary threshold was abolished for international graduates, and they were exempted from the immigration quota, even if they left the country and returned at a later date (European Commission, 2019^[65]).

Improving digital and management skills to increase uptake of digital technologies

The development of high-tech manufacturing requires sophisticated digital technologies, such as cloud computing, big data and artificial intelligence. Adoption of digital technologies can help SMEs integrate in global markets, as it reduces the costs associated with transport and border operations (OECD, 2021^[66]). Latvia’s digital infrastructures are well developed. Nevertheless, it lags behind most advanced OECD

countries in the adoption of sophisticated digital technologies as well as other ICT technologies, especially by SMEs (OECD, 2019_[2]) (OECD, 2021_[17]). Latvia has adopted a range of policy instruments to promote ICT usage by businesses (OECD, 2020_[67]); for example, the competence centres (see below) increase awareness of digital technologies and provide relevant training. In addition, many firms have gained experience with digital working methods during the pandemic and adapted their work organisation to digital technologies. Still, insufficient digital skills and complementary competences such as advanced management limit the capacity of Latvian firms to make the best use of available technologies.

The level of basic or above basic digital skills held by the public is well below the EU average. Only 43% of the population has at least basic digital skills – a measure based on activities performed by individuals on the Internet as well as using computers and other digital devices – compared with 58% in the average EU country. The government is tackling the need to improve digital skills by increasing support for adult training and updating school curricula. It has set targets to increase adult participation in education from 7.4% in 2019 to 12% in 2027 (see also below) and to improve the population share with basic digital skills to 70%. To ensure proper management of digital training programmes standardised data collection is required. Latvia should measure digital competency, instead of relying solely on a narrow definition of ICT usage. Latvia's participation in the next round of the OECD survey of adult skills (PIAAC) is a useful step.

High managerial skills are required to improve business processes and are associated with faster digital adoption and productivity gains (Bloom et al., 2019_[68]) (Sorbe et al., 2019_[69]). However, in Latvia relatively few firms are run by professional managers (rather than by family members), which can hinder the adoption of modern managerial approaches (OECD, 2021_[17]). Additionally, low-skilled managers might not have the most up-to-date information regarding trends in global demand, a factor that is associated with greater export duration (Benkovskis et al., forthcoming_[13]). Targeted learning programmes at managers in SMEs and SOEs would help to ensure that they are aware of digital technologies' potential and hence support worker training. Likewise, training managers would help improve digital security and privacy. In general, in micro-firms digital uptake relies more heavily on business owner or manager skills, awareness and perception of potential risks and benefits (Al-Awlaqi, Aamer and Habtoor, 2021_[70]). Therefore, training could leverage their digital uptake. Latvia could learn from the United Kingdom's Small Business Leadership Programme, which provides management training to small business leaders and aims to assist firms in strengthening local networks of business leaders, getting them signed up to mentoring programmes and promoting knowledge-transfer partnerships with academia (OECD, 2021_[66]).

Digital technologies create new opportunities to update and develop new skills throughout life, for instance, via distance and modular learning. Online courses allow flexibility for workers and savings to firms, especially in small companies where lack of time and funding are important barriers. Nonetheless, in 2019 Latvia had the second-lowest participation rate in online courses in the OECD (Figure 2.24). However, the pandemic caused a sudden acceleration of online learning, with effects that are likely to persist. For example, training through the digital platform Coursera was provided free to both the employed and the unemployed. This initiative has proved successful, and the unemployed have shown keen interest in digital and business courses. The government should accelerate its collaboration with education and training providers, employers, job-search agencies and digital-learning platforms to expand the use of distance and modular learning on the job and to define standards that better signal the quality of online courses.

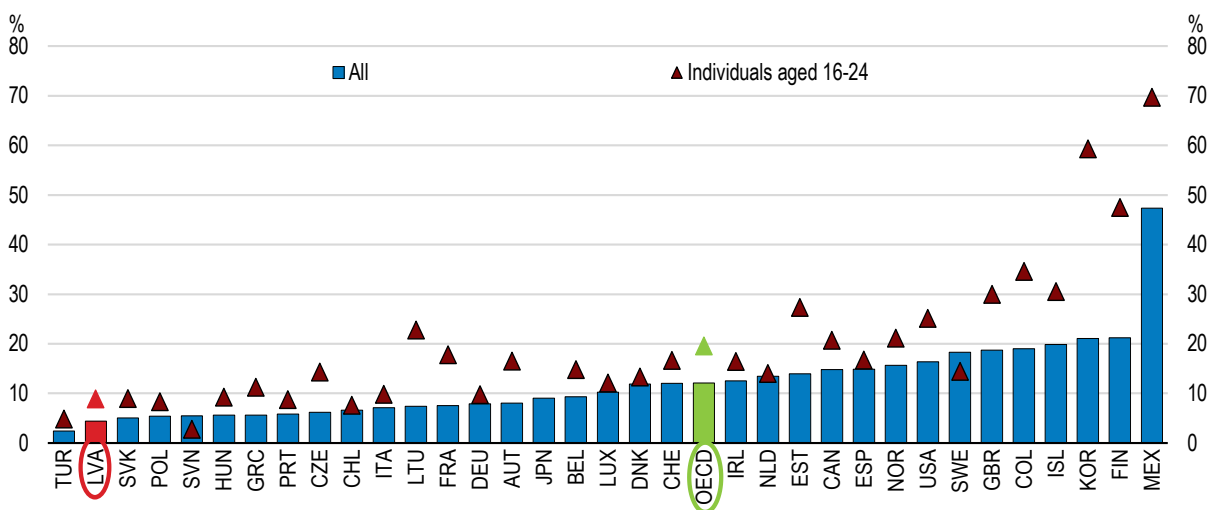
Enhancing adult education by establishing a training fund

Adult education could match skills supply to employer demands and improve employability and working conditions of older workers. According to the OECD Priorities for Adult Learning indicators, Latvia is ranked fourth in terms of urgency of getting the adult learning system ready for the future (OECD, 2021_[71]). There is room for improving foreign language skills, as English proficiency is still below that in most European countries (EF EPI, 2020_[72]). In addition, due to population ageing and structural changes in the economy, specific skills rapidly become obsolete, and firms report a lack of employees with high skills as a significant

barrier to investing (see above). Nonetheless, the EU Labour Force Survey shows that in 2020 only 6.6% of Latvian adults had participated in adult education on a monthly basis, compared with 9.2% in the EU average, both down from pre-pandemic outcomes. However, other surveys show more positive results, especially regarding non-formal adult education.

Figure 2.24. Participation in online courses is low

Percentage of individuals participating in online courses, in 2019 or latest available year



Note: Data refer to 2018 for Canada, Colombia, Japan and Mexico, 2017 for United States.

Source: OECD ICT Access and Usage by Individuals Database.

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Removing financial barriers to participation and motivating employers to offer quality training are important challenges in developing adult learning. A substantial share of adult learning happens within firms, but employers in Latvia are lagging in the provision of training. Enterprise investment in continuous vocational training as a percentage of total labour cost in Latvia (0.8%) is the lowest in the European Union (Eurostat, 2021^[73]). The cost of training is a significant hurdle: 46% of Latvian enterprises mention that cost is an important barrier to further expanding their training provision, compared with 35% on average in the European Union. Micro and small-sized enterprises, which employ approximately 57% of the Latvian labour force, are most affected, as they have less capacity to provide employee training than their larger counterparts and because training costs per employee decline with the number of participants. Introducing training levies, as suggested in previous reports on this issue (Maslo, 2017^[74]) (OECD, 2019^[50]), would help to tackle these challenges. Levy schemes are designed to pool resources from employers to pay for training and help to overcome employer concerns that other employers will poach staff in whom they have invested training.

Typical levy schemes are levy-grant schemes, levy-exemption schemes and cost reimbursement schemes (Box 2.6). OECD countries differ in the magnitude of levies and whether they depend on employer size and sector. In most cases levy schemes are set up within sectoral agreements, so strong tripartite relationships are an essential feature of successful systems (OECD, 2019^[50]). As recommended in the 2019 *Survey*, promoting the provision of joint training involving several firms would help micro and small firms to offer high-quality work-based training. When Korea implemented training levies in the mid-1990s, it suffered from a lack of SMEs' engagement. To address SME barriers to participation the Korean government grouped SMEs from similar sectors into training consortia. These were run by training specialists who conducted skills and training needs assessments for each SME, planned training programmes and then conducted evaluation studies upon an SME's completion of a training programme.

The programme had a significant positive impact on SME participation, and the proportion of SMEs using training funds increased from 11% to 55% in one year. Consequently, the programme was rolled out on a national level (OECD, 2020^[75]).

The advantages of levy schemes are that they do not require public funds and raise both awareness and commitment to providing training. They secure a stable source of funding, regardless of the business cycle and the availability of EU funds. However, a levy will increase the tax wedge –already high in Latvia – especially on low incomes, which risks damaging efforts to shrink the informal economy (Chapter 1). Therefore, as a complementary measure, the government should reduce employer social security contributions and rely more on property, corporate and excise taxes (Chapter 1). It may be easier to start the levy scheme in a particular sector or geographical area. This will improve the quality of training and allow better matching with skills shortages. Additionally, Latvia should strengthen the legislative framework for training policies, which is currently incomplete. The OECD and the Directorate-General for Structural Reform Support of the European Commission are co-operating to help Latvia design a new regulatory framework, which will support and incentivise employers to up-skill and re-skill their employees (OECD, 2021^[76]).

Box 2.6. Typical types of training levy

	Levy-grant schemes	Levy-exemption schemes	Cost-reimbursement schemes
Description	Payroll contributions are collected from employers and distributed as grants.	Employers are required to dedicate at least a certain percentage (e.g. 1%) of payroll towards training, or submit the equivalent to government.	Firms pay a compulsory levy, but can claim expenses back for any training costs incurred during the year.
Advantages	Higher grants can be given to firms with higher training expenses and made conditional on training specific skills relevant for labour market.	Marginal cost of training for employer is close to zero up to the amount of tax liability. Also, employers have freedom in planning training.	Low administrative burden. Employers have freedom in planning training.
Disadvantages	Require many case-by-case decisions, higher administrative costs. Grant application can be more burdensome for small firms.	Employers may opt out of training as it is easier to pay the levy than provide training.	In order to get money back employers may spend money on any type of training, regardless of quality.
Country examples	Italy, Poland, Korea, France, Netherlands, United States (Arizona Job Training Tax).	Hungary, Greece, Australia.	Denmark, Belgium.

Note: Countries often have hybrid schemes with funds raised through levies and distributed through grants and direct subsidies.

Source: OECD (2020), *OECD Skills Strategy Implementation Guidance for Latvia: Developing Latvia's Education Development Guidelines 2021-2027*, OECD Skills Studies, OECD Publishing, Paris, <https://doi.org/10.1787/23078731>; OECD (2019), *Getting Skills Right: Future-Ready Adult Learning Systems*, OECD Skills Studies, OECD Publishing, Paris, <https://doi.org/10.1787/9789264311756-en>.

Increasing access to higher education

Despite high tuition fees, student loans are not a common practice in Latvia. The higher education attainment rate among young adults (25-34 year-olds) has increased from 32% in 2009 to 44% in 2019 and is now only slightly below the OECD average (45%). Nevertheless, Latvia has some of the highest tuition fees among European countries, although they vary widely across institutions. The majority of tertiary students enrol in public institutions where only one in three students pay fees for bachelor's programmes (OECD, 2019^[48]). Tuition fees are usually lower in regional higher education institutions than in Riga. Despite relatively high fees, fewer than 5% of students in Latvia took advantage of loans guaranteed by the government between 2017 and 2019, and in 2019 the average borrowing was around USD 2900 a year (converted using PPPs), compared with USD 5100 in Korea and USD 8300 in New Zealand, two countries with relatively similar tuition fees (OECD, 2020^[47]) (OECD, 2021^[77]). In 2020, Latvia introduced a new scheme aiming to facilitate access to loans by simplifying issuing procedures, by

providing no need for a second guarantor other than the state and increasing the cap for loan amounts. In addition, both full- and part-time students can now apply for the loans. These efforts increased the demand for the loans substantially, and the share of students who use them among those who pay tuition fees doubled. However, the amount foreseen in the medium-term budget for this new lending model might not be sufficient.

Opportunities to study at universities could be improved by increasing state funding dedicated to student loans. Student loans transfer the payment for education from when beneficiaries have little to no income to when they generally have greater income after graduation and may help reduce high dropout rates. In a few OECD countries (such as Norway) the government offers a combination of loans and grants, and academic performance is one of the criteria it uses to determine eligibility (OECD, 2020^[47]). Latvia should maintain the increase in the generosity of its student loans. In addition, it should consider expanding and prioritising grants to decrease the high dropout rates and ensure that access to higher education is not impaired due to the reduction of income resulting from the rise in youth unemployment (Chapter 1).

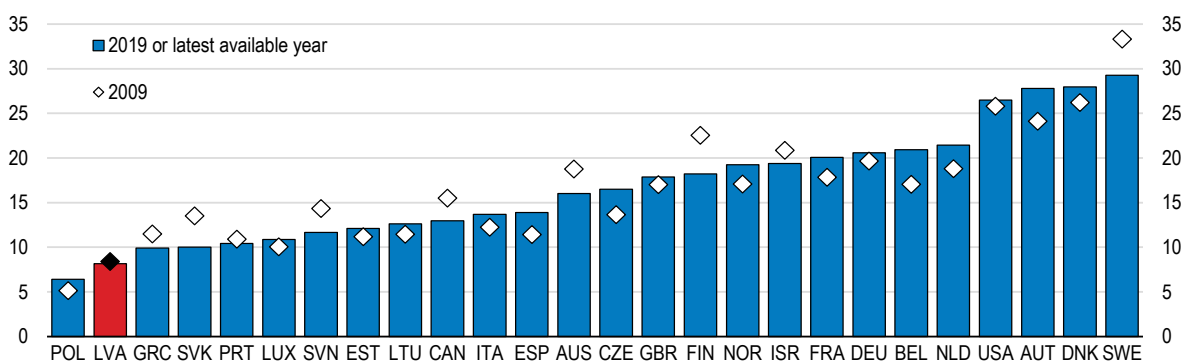
Increasing R&D and innovation from its low base

Latvia's innovation performance is poor


As a country moves toward high-income status, innovation becomes the main determinant of its GVC participation and productivity outcomes (see Box 2.1 above). Such status is normally delivered either entirely through services or in GVCs that are highly services-intensive (World Bank, 2020^[4]). The fact that Latvia's manufacturing exports are in the mature phase of their life cycle compared to many other OECD countries (Araujo, Chalaux and Haugh, 2018^[7]) also highlights the importance of innovation to sustain the future export performance of the economy. Nevertheless, its competitive advantage is still based on low labour costs, while innovation plays a relatively minor role, especially in the business sector. The ratio of technological equipment and intellectual property to GDP has increased marginally since its pre-2008 crisis level and remains one of the lowest among European peers (Figure 2.25). Patent applications per million inhabitants (17.4 in 2018) are among the lowest as well, perhaps also because SMEs lack knowledge on the registration process and its benefits.

Figure 2.25. Technology and intellectual property fixed assets remain low

ICT equipment and intellectual property fixed assets, % of GDP

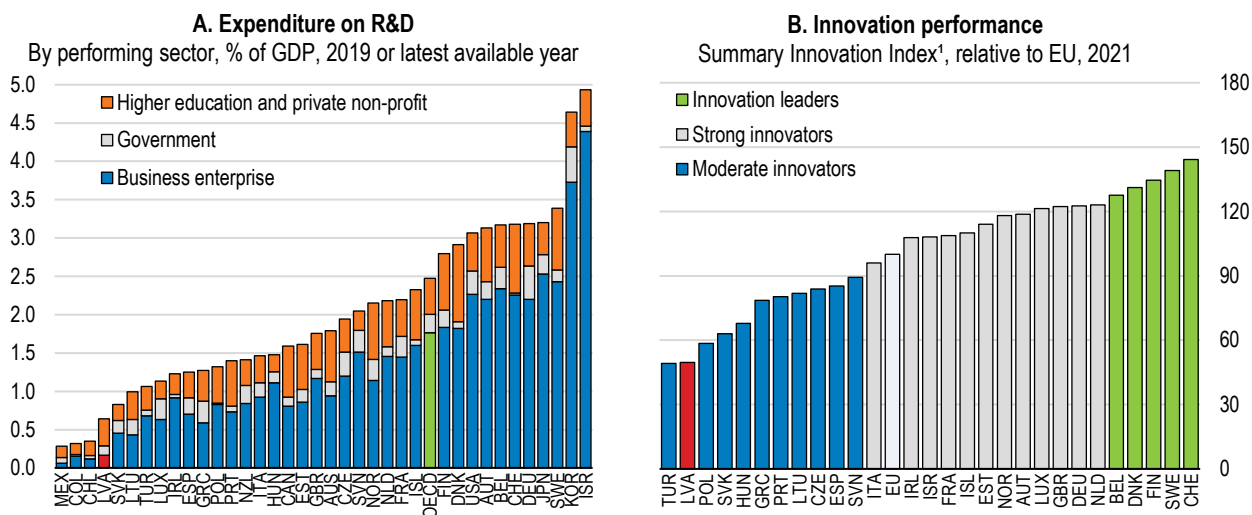


Source: OECD National Accounts database.

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Gross Research and Development (R&D) spending as a share of GDP, at around 0.7%, is only about a quarter of the EU average (Figure 2.26). It has remained relatively stable over the last decade, despite significant policy effort to increase it. The official target was to raise total R&D expenditures to 1.5% of GDP by 2020, and now it is set as the target for 2027. The share performed by the higher education sector has risen in recent years. At the same time, the business component – about a quarter of the total, compared to around half on average in the European Union – is still low, despite the implementation of several support programmes, including the competence centres (Box 2.7), innovation vouchers worth up to 25000 euros, innovation motivation programmes and various financial instruments. Measurement errors may explain low spending by private companies because there is a weak incentive for firms to accurately separate R&D from other expenses due to the way the tax system treats R&D expenditures. Tax incentives for R&D weakened significantly during the last decade (see below). Latvia has introduced a requirement for large and medium-sized companies to report R&D costs in detail in their annual financial statements to improve data accuracy and availability, starting with their annual reports for 2021. The large share of micro and small firms and the sectoral structure of the economy are other potential explanations for low business R&D spending. However, other small countries with many small firms (such as Finland) have succeeded in fostering innovation and R&D investment. Furthermore, Latvia’s R&D spending was low in all economic sectors in 2015 (latest data), without exceptions (Figure 2.27); the closest result to the OECD average being in the field of electrical equipment, where Latvia has specialised in photonics. Weak incentives to invest in R&D, the underfunded higher education system and the minimal supply of researchers and STEM graduates seem to play bigger roles in explaining low R&D spending.

Figure 2.26. Innovation is weak



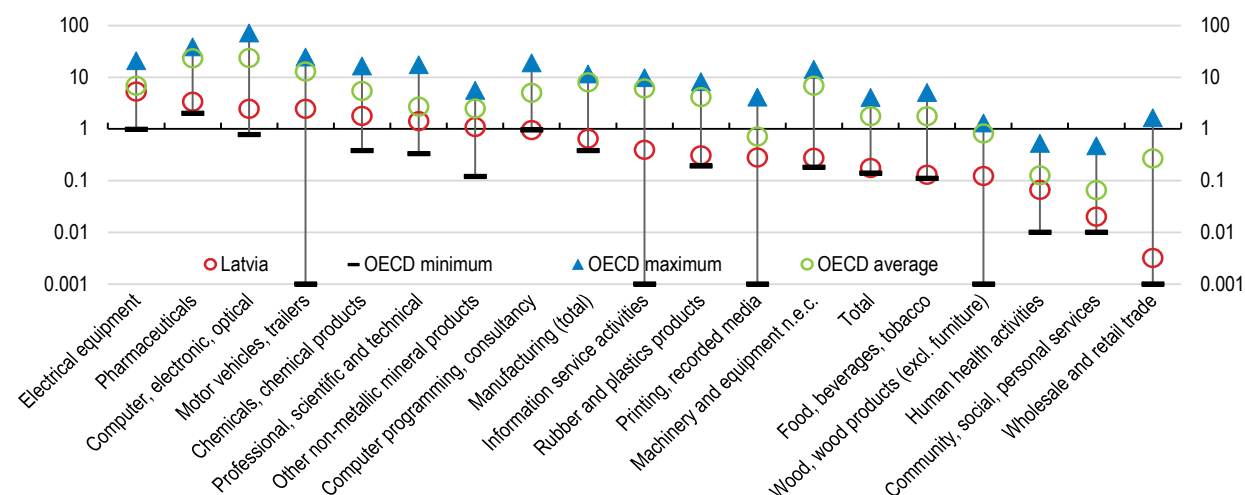
1. The colours show normalised performance in 2021 relative to that of the EU27 in 2021: green above 125%; grey: between 95% and 125%; blue: between 50% and 95%. Innovation performance is measured using a composite indicator, which summarises the performance of 27 different sub-indicators.

Source: OECD Main Science and Technology Indicators database; European Commission, *European Innovation Scoreboard 2021*.

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Figure 2.27. Latvia's R&D spending is low in all economic sectors

As a percentage of each industry's value added, 2015



Note: Logarithmic scale. Averages are weighted using value added in purchasing power parities (GDP). Data for Chile, Estonia, Hungary, Japan, Lithuania, Portugal and the United States are for 2014. Data for France are for 2016.

Source: OECD (2021), *Going Digital in Latvia*, OECD Reviews of Digital Transformation, OECD Publishing, Paris, <https://doi.org/10.1787/8eec1828-en>.

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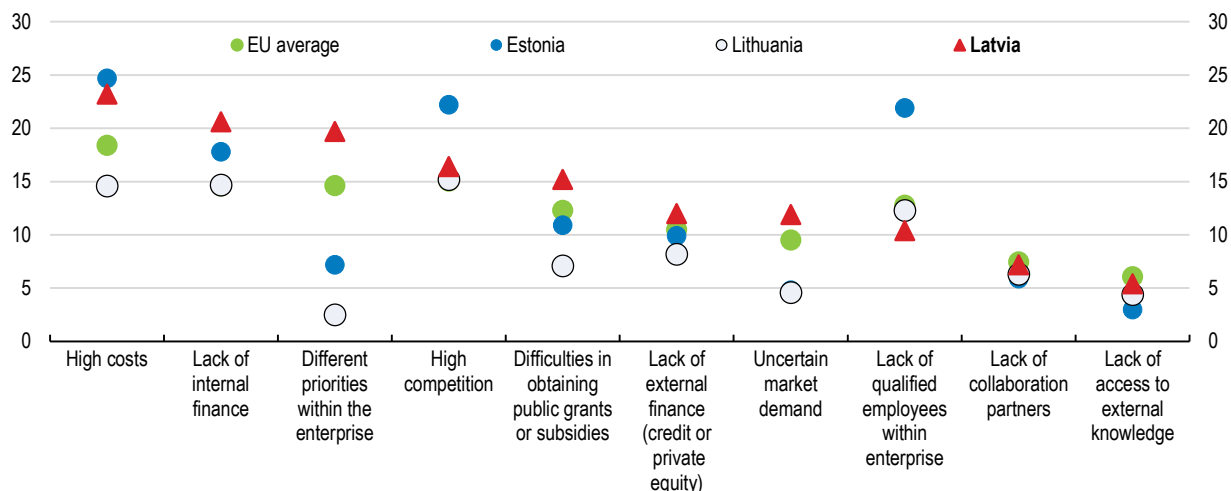
Box 2.7. The Competence Centres Programme

In 2010, Latvia launched the Competence Centre Programme, managed by the Ministry of Economics. These centres aim to promote applied research and frontier innovation in sectors aligned with the Smart Specialisation Strategy (bio-economy, bio-medicine, smart energy, smart materials and ICT) and help develop new products and technologies by fostering co-operation between the research sector and industry. Although the competence centres receive funding from the European Regional Development Fund, they are majority owned by the private sector. At least a quarter of their funding must be earmarked for experimental development. By the end of 2018, support was given to almost 150 firms to create or improve 174 products, with 175 masters and doctoral students involved in research and over 200 academic articles published. From 2022, the Competence Centres will be consolidated with the cluster programme – which supports the capacity of SMEs to engage in national and international markets – to facilitate collaboration between merchants and research, education and dissemination organisations at the local and international level.

As in many other OECD countries the lack of internal funding and the high perceived costs of innovating are two major factors most frequently cited by individual firms as hampering their innovation efforts (Figure 2.28). In 2018 33% of Latvian firms with at least 10 employees engaged in some kind of innovation activity, eight percentage points higher than in 2008. Still, the share remains among the lowest in the European Union and much lower than in Lithuania and Estonia. In Latvia high costs of innovation-related activities are perceived as an important limiting factor, especially among manufacturers, less so among firms within the services sector. In addition, difficulties in obtaining public grants and uncertain market demand seem to be more important in Latvia than for its peers. Difficulties in financing innovation projects are also a result of relatively high interest rates and unfavourable terms and conditions on bank loans (Chapter 1).

Figure 2.28. Lack of internal funding and high costs hinder innovation activities

The share of enterprises that state the factor has high level of importance in hampering innovation activities, %



Source: Eurostat Community Innovation Survey 2018, OECD calculations.

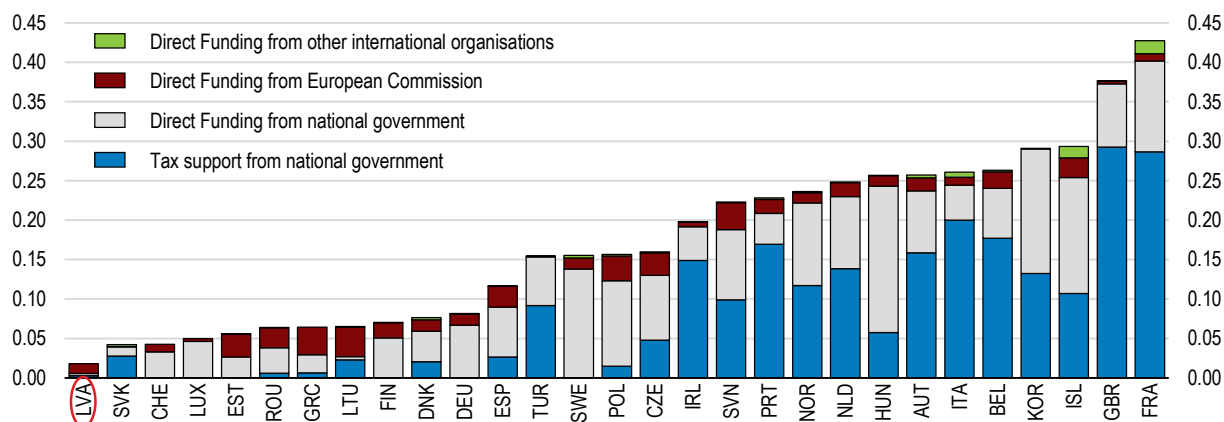
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Increasing the level of public support to business R&D

99. The financial benefit from R&D investment for the individual firm is lower than the benefit for the economy as a whole because of positive externalities. If one firm innovates, the resulting knowledge may spill over to other firms that either copy or learn from the original research without having to pay the full costs. Appropriate property rights ensure that innovating firms benefit from the R&D that they carry out. Still, difficulties in fully internalising the returns to innovation activities imply that private innovation efforts are likely to remain inefficiently low without subsidies. Likewise, the returns to financing R&D projects are subject to a high degree of uncertainty. Start-ups typically have little capital following their creation. It is hard for lenders to gather reliable information on the future profitability of these projects, and, as innovation is intangible unless embodied in capital equipment, firms have no collateral to pledge to banks in return for debt funding. The latter is a major obstacle in Latvia. In 2018 only 4% of Latvia's innovative firms obtained external debt to fund their innovation activities, and only 0.9% got equity, compared with 6.5% and 3.2%, respectively, in the European Union on average (Eurostat, 2018^[78]). Consequently, OECD countries often use financial-support instruments to increase R&D spending. Nevertheless, in Latvia, government support for business R&D is extremely low (Figure 2.29).

Figure 2.29. Low government support for business R&D

Direct funding and government tax support for business R&D, % of GDP, 2018 or latest available year



Source: OECD R&D Tax Incentives database.

StatLink  <https://stat.link/zl6b5m>

Latvia is among a minority of OECD countries that has not offered R&D tax incentives since the tax incentive for deductibility of R&D costs was abolished in 2018 (only three years after it was introduced). This is in contrast with the general trend among OECD countries. Over the last decade a majority have moved progressively towards tax-based support measures to incentivise business R&D (OECD, 2020^[79]), and across the OECD 55% of all R&D government support is provided through R&D tax incentives (OECD, 2020^[80]). Latvia's abolition of its R&D tax incentives was part of its 2018 Corporate Income Tax reform that (as in Estonia) taxes corporate profits only when they are distributed and not when profits are retained. Therefore, Latvia's tax code treats business R&D expenditures identically to tangible capital investment, even though R&D expenditures are much smaller than in most OECD countries and externalities from R&D investments are usually larger due to knowledge spill overs.

Enhancing the generosity of support for R&D spending while keeping it as broad-based as possible would help Latvia increase innovation activities and participation in GVCs. Internationally, a 10% fall in the price of R&D results in at least a 10% increase in R&D, while other outcomes such as patenting and labour productivity also increase following a reduction in taxes on R&D activities (Bloom, Van Reenen and Williams, 2019^[61]). The introduction of an R&D tax credit in Norway in 2002 stimulated not only R&D investments but also imports of intermediates, which are crucial to GVC participation, as firm-level R&D investments and imports are complementary activities (Bøler, Moxnes and Ulltveit-Moe, 2015^[81]). However, because in Latvia the corporate income tax is applied only to distributed profits, an already generous tax approach, the effect of tax incentives for R&D may be smaller. Still, the insufficient level of business R&D, lower direct funding than elsewhere (Figure 2.29 above) and high total gross fixed capital formation relative to GDP suggest that more should be done to make R&D attractive. At least, the 2018 tax reform needs to be evaluated to see if the identical treatment of R&D investment and other tangible forms is justified.

Currently, the majority of support for business R&D in Latvia takes the form of direct funding and tax incentives for hiring R&D staff in start-ups. For example, since 2017 innovation vouchers have been aimed towards micro, small and medium-sized businesses that develop new products or technologies. These upfront subsidies are attractive for riskier research, which is usually conducted by young and small firms that are more likely to be operating at a loss or financially constrained. Small firms indeed appear internationally to respond more positively than their larger counterparts to business support policies (Crisciolo et al., 2019^[82]). Nevertheless, the share of innovative firms and R&D expenditures in Latvia is

low both for small and larger firms (those with more than 50 employees). Therefore, Latvia should consider increasing the current level of support, along with steps to enhance the supply of researchers, and to rely more on indirect funding. Indirect funding is less dependent on the discretionary decisions of government officials and favours firms already performing R&D. Support could be given in the form of refundable tax credits. This kind of support seems appropriate to Latvia because of its unique corporate income tax system. However, Pillar II requirements in the global minimum tax reform might argue for more government grants instead. Significant support for R&D can also be made with public funding, including from European Structural Funds and the Recovery and Resilience Facility.

Additionally, Latvia could incentivise R&D spending by anchoring innovation criteria more firmly in public procurement. Latvia changed its Public Procurement Law in 2017 to increase the impact of public procurement on innovation development and make more efforts to raise awareness for innovative procurement in the public sector. Still, the integration of strategic objectives in the public procurement process is relatively new, and the inclusion of environmental and innovation selection criteria is not highly developed. The World Economic Forum's Global Competitiveness Report 2017-2018 (the latest covering this matter) stated that Latvia's government procurement of advanced technology products takes 119th place among 144 countries, although reporting errors in filling in the questionnaire might have contributed to this poor result. Nevertheless, given the importance of government procurement – about 11.5% of GDP prior to the pandemic (OECD, 2019^[83]) – Latvia should maintain efforts to anchor innovative thinking at management level. In Germany innovation-oriented public procurement has resulted in higher sales of innovative products by companies receiving contracts (Czarnitzki, Hünernund and Moshgbar, 2020^[84]).

Working in partnership with LIAA, the OECD's Observatory of Public Sector Innovation (OPSI) is developing approaches to stimulate anticipatory innovation (Tönurist and Hanson, 2020^[85]) in Latvia by testing ways to enable businesses, research institutions, civil society and government to collaboratively develop innovation strategies and coordinated action in response to anticipated opportunities and risks. This project is ongoing throughout 2021 and 2022 and will build up knowledge on the roles of government bodies in innovation ecosystem management.

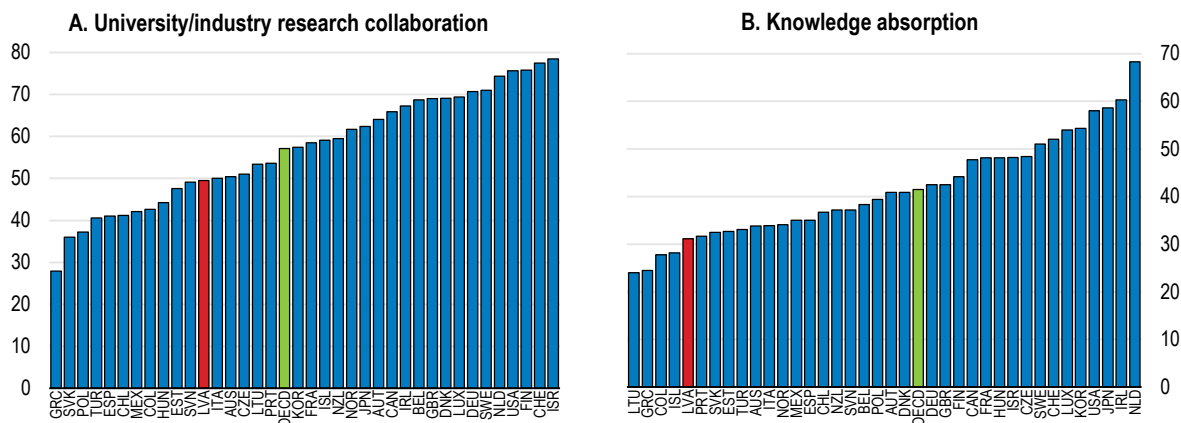
Fostering knowledge transfer through stronger incentives

The transfer of knowledge and technology from research institutes to firms remains limited, with little mobility between the two sectors and weak knowledge absorption by firms (Figure 2.30). The likelihood of national R&D leading to commercial opportunities in Latvia is perceived by experts as low (Bosma et al., 2020^[86]).

Financial benefits for academic researchers play a crucial role in promoting intellectual property creation and academic entrepreneurship. Academic faculty respond to royalties both in the form of cash and research support (Lach and Schankerman, 2008^[87]). After Norway moved towards a model where the university holds majority rights of patents, both entrepreneurship and patenting rates by individual researchers halved (Hvide and Jones, 2018^[88]). Still, as taxpayers finance universities and provide the infrastructures and staff needed to innovate, a fair share of revenues should belong to these public institutions. In addition, there are potential complementarities between institution-level and researcher-level investments, including through the motivation of the institutions to establish technology-transfer offices. Thus, it is essential to find the right balance of rights between scientists and higher education institutions. In 16 out of 33 OECD countries for which information is available, universities themselves set the rules in revenue-sharing schemes. Where national guidelines exist, the share for researchers is often set between 33% and 50%. Latvia is a notable outlier, as all revenue accrues to the universities, dampening incentives (OECD, 2019^[89]).

Figure 2.30. The transfer of knowledge and technology from research institutes to firms is limited

Global Innovation Index 2020, scores from 0 to 100



Note: Panel A: Results show the average answer to the survey question: 'In your country, to what extent do people collaborate and share ideas between companies and universities/research institutions?' Panel B: The knowledge absorption index is a composite indicator that measures how good economies are at absorbing and diffusing knowledge. It is based on the following indicators: intellectual property payments as a percentage of total trade; high-tech net imports as a percentage of total imports; imports of communication, computer and information services as a percentage of total trade; net inflows of foreign direct investment relative to GDP; and the share of research workers.

Source: Global Innovation Index 2020, <https://globalinnovationindex.org>

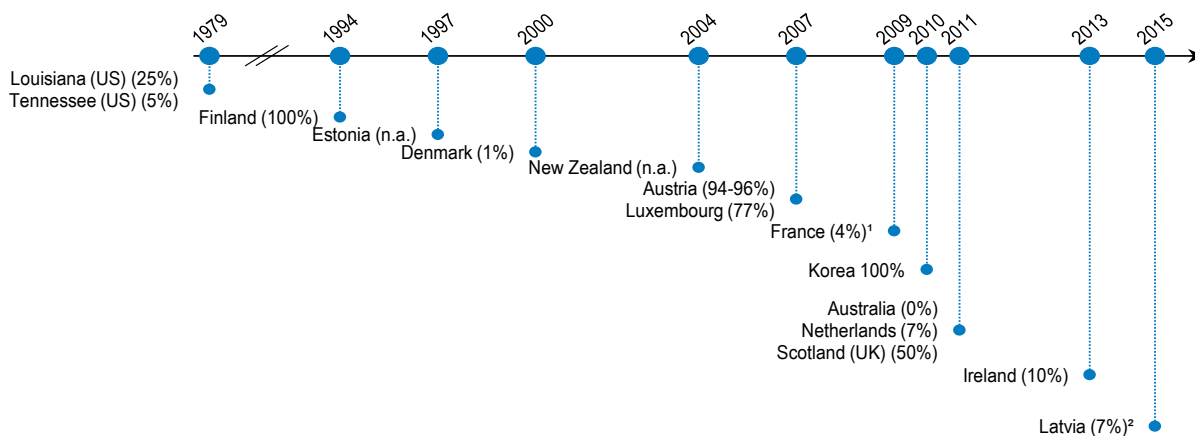
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A major challenge to university-business cooperation is the low level of funding. Both academics and higher education institution representatives place lack of funding as the top barrier to greater cooperation with firms, even though several support programmes are available (see below) as well as government support for applied research. This concern is significantly greater than the EU average (Ejubovic et al., 2019^[90]). Total and R&D expenditures per full-time student are low compared with Lithuania and Estonia and did not increase from 2012 to 2017 (latest available data), despite declining student numbers (OECD, 2020^[47]). Performance-based funding, introduced in 2015, rewards universities engaging in research with businesses. Nevertheless, stronger incentives to collaborate with industry would be welcome. The share of higher education institutions' funding subject to reaching performance targets is only 7%, where as in Austria the share is 95% and in Finland and Korea 100% (Figure 2.31) (OECD, 2019^[89]).

To manage the limited resources better there is room for further consolidation of higher education institutions. The consolidations that occurred after 2014 were mostly effected at the administrative level without reallocating any researchers (OECD, 2019^[2]). Latvia still has considerably more higher education institutions than Estonia and Lithuania. In addition, the quality of research – measured by the share of publications in the top 10% of most cited documents and international collaboration – is low compared with most other EU countries (OECD, 2021^[17]). Concentrating research funding in a smaller number of institutions would allow the formation of institutions with a deeper pool of expertise (OECD, 2021^[17]), improve research quality and facilitate knowledge transfer. The pooling of resources in the agreed smart specialisation areas may provide a base for gradual change in this direction.

Figure 2.31. Financial incentives to collaborate with industry could be stronger

Year of introduction of performance contracts and shares of universities' institutional block funding involved



1. In France the share involves 4% of operating costs of French Higher Education Institutions (HEIs), excluding payroll. France introduced contracts between the State and higher education institutions already in 1989. In 2007 they established compulsory multi-year performance contracts with the objective of fostering a strategic dialogue between the State and HEIs, taking into account their newly gained autonomy. In 2009, the first multi-year performance contracts were concluded.

2. In Latvia performance-based funding was introduced in 2015 (so-called 2nd-pillar funding for HEIs). It is a separate envelope of the State budget for which HEIs compete. The allocation of this funding depends on their annual performance compared to that of other HEIs.

Source: OECD (2019), *University-Industry Collaboration: New Evidence and Policy Options*, OECD Publishing, Paris. <https://doi.org/10.1787/e9c1e648-en>

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Latvia could also foster knowledge transfer through changes in the governance of its higher education institutions. In most OECD countries university governance structures include a board as the main decision-making body with private-sector participation in 25 OECD countries, but not in Latvia. Participation in boards enhances the propensity of institutions to cooperate with industry and support knowledge transfer. In most cases business representatives are from large firms, but some countries such as Iceland and Ireland also include SME representatives (OECD, 2019_[89]).

Monitoring and evaluating knowledge-transfer activities would help to improve performance over time. Dedicated agencies are increasingly important for systematic evaluation and monitoring of university performance, and in 2019 19 OECD countries (excluding Latvia) had such dedicated agencies (OECD, 2019_[89]). Dedicated agencies have also proven successful in supporting academic staff in identifying industry challenges and marketing their solutions to them. The new graduate tracking system, which uses administrative data, could help assess the transfer of knowledge activities, especially by publishing PhD and STEM graduates' outcomes in the labour market.

Latvian academics are convinced of the importance of collaborating with businesses on research and training. However, in 2017 (latest data available) they considered their knowledge about business needs, their networks and the support to undertake university-business collaboration as lacking (Ejubovic et al., 2019_[90]). Latvia has set up a Single Technology Transfer Centre to foster industry-science cooperation that uses technology scouts who promote collaboration between researchers and entrepreneurs on a daily basis. These centres also offer grants for research that result in commercialisation (maximum of EUR 300 000 per project). Likewise, innovation vouchers provide funding for private companies to acquire services from scientific institutes. However, the mobility of researchers and PhD students from academia to the private sector remains low. For example, since the introduction of innovation vouchers in 2017, only five companies out of 92 recipients have implemented projects that include the attraction of researchers. As in France and Ireland, mobility schemes for advanced students and researchers could increase collaboration. Short placements may increase company awareness of

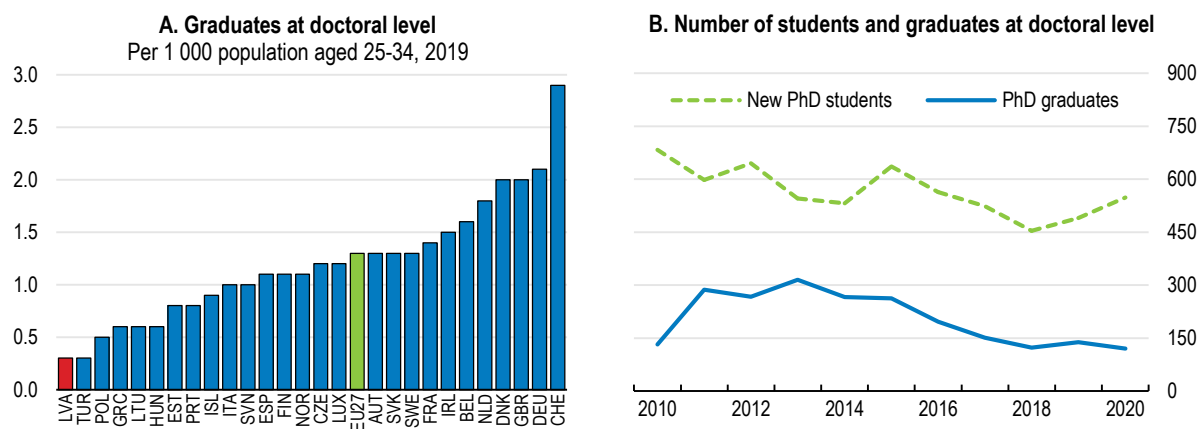
technology-transfer possibilities and build networks, while longer placements may lead to permanent employment of researchers in private firms (European Commission, 2020^[91]). Similarly, more work-based learning opportunities in advanced programmes – e.g. writing a final dissertation in a company – would create a greater exchange of knowledge between academics and industry representatives.

To promote cooperation between industry and research institutes, LIAA introduced several new measures. For example, the Latvia Technology Business Centre aims to support SMEs in creating an innovative business by offering free training and funding product prototypes. To improve the implementation of these initiatives, the state institutions responsible for support measures should have more freedom to determine remuneration policy for their employees. For example, they could be given a status other than that of a state institution, which limits remuneration possibilities.

Attracting and retaining PhD students

Latvia lags the OECD average in terms of numbers of researchers, PhD students and STEM graduates (see above). Without actions to increase the supply of high-quality researchers, it will be extremely difficult to boost R&D spending substantially. Therefore, the government aims to raise the number of full-time equivalent researchers from 6000 to 8000 by 2027. The starting point is dire: the number of PhD students and graduates is the lowest in the European Union (Figure 2.32, Panel A), and there are over 1000 scientists currently older than 65 who are likely to retire within the next decade (European Commission, 2020^[91]). After researchers' salaries were increased substantially in recent years, the government, justifiably, aims to introduce a tenure-track system and to abolish the distinction between academic (mainly teaching) and research positions in higher education institutions. These improvements in working conditions should help to attract more PhD students.

Figure 2.32. The number of PhD graduates is low and decreasing



Source: Eurostat database.

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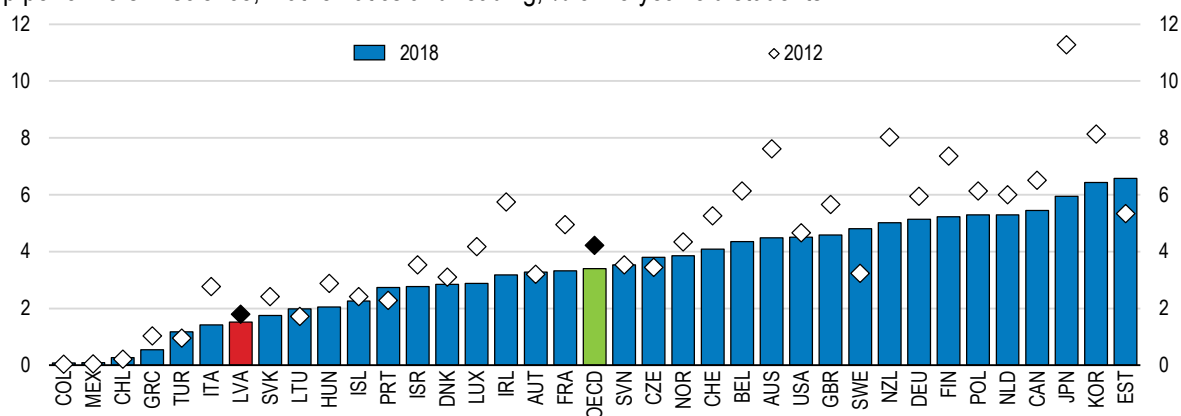
Nonetheless, further efforts to improve scholarships are needed, especially for attracting and retaining PhD students in STEM fields. The number of PhD graduates in Latvia has been declining in recent years, and doctoral student dropout rates are high (Figure 2.32, Panel B). The ratio of graduates to new PhD students is less than one third, implying a high dropout rate. Due to inadequate scholarship grants, most PhD students take up full-time jobs with no direct connection to their studies and, as a result, do not have sufficient time to work on their dissertations (European Commission, 2020^[91]). These financial challenges are particularly present in specific fields of study with high alternative wages such as ICT. Consequently, the share of STEM doctoral students among the small total number of PhD students in Latvia is lower than in either Estonia or Lithuania (Eurostat, 2020^[92]).

To boost the number of researchers and research quality, Latvian research institutions would have to attract foreign and Latvian scientists currently working abroad. Only 2% of higher academic staff working in Latvia have foreign citizenship, compared with 6% in Estonia, and about 15% of Latvian researchers are currently working abroad. The negligible share of foreign academic staff hurts the ability to improve the quality of research by increasing international collaboration (OECD, 2017^[11]). For example, in computer science, the share of scientific publications resulting from international collaboration is the OECD's lowest and less than a third of the share in Estonia (OECD, 2021^[17]). Any improvement in working conditions would help to attract more scientists from abroad. Raising transparency and openness during the selection process and reducing language barriers are needed as complementary measures. Currently, advertising of most vacancies is only in Latvian, and many have Latvian language requirements (European Commission, 2020^[91]). To attract top Latvian researchers working abroad Latvia should consider a more proactive approach. In Israel a dedicated centre aims to absorb immigrant scientists and returning residents by financing part of their wages for two years. Besides, the centre provides special scholarships for doctoral and post-doctoral studies as well as consulting and accompaniment services for Israeli scientists returning from abroad. Nonetheless, such efforts should keep in mind the positive effect from Latvian scholars working abroad due to their role as links between Latvian and non-Latvian researchers and firms.

Nurturing top performing high school students could help create a larger supply of PhD candidates and inventors in the future. Even though Latvian 15 year-olds' PISA scores are similar to the OECD average, the share of top performers is low (Figure 2.33). Programmes that expose more students to more advanced curricula, targeting in particular underprivileged regions, students and minorities, may help to boost the number of top performers (Van Reenen, 2020^[93]). For example, in Boston public schools students who do well on third-grade test scores are placed in a programme that provides them with a dedicated classroom with high-achieving peers, advanced literacy curricula and accelerated math in later grades. Rigorous research found that this programme boosts education outcomes, with gains primarily for minority students (Cohodes, 2020^[94]). Another set of policies is around mentorship, which could have high potential if targeted at young people who are normally less exposed to high innovation environments (e.g. the aforementioned mentorship by women scientists for girls).

Figure 2.33. The share of top performers in PISA is low

Top performers in science, mathematics and reading, % of 15 year-old students



Note: Top performers in science, mathematics and reading are students who achieved the highest level of proficiency (i.e. Levels 5 and 6) on the OECD's PISA assessment.

Source: OECD (2014), *PISA 2012 Results: What Students Know and Can Do* (Volume I, Revised edition, February); OECD (2020), *PISA 2018 Results* (Volume I).

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MAIN FINDINGS	RECOMMENDATIONS
Strengthening competitiveness and promoting export diversification	
The range of products in which Latvian firms specialise has broadened, and the quality of products has increased. Still, production is concentrated in low-complexity products, and few exports go to outside the EU. Statutory restrictions on FDI are low.	Strengthen business networks to support SMEs throughout their internationalisation process. Prioritise companies trying to enter distant markets in future support expansions.
Improving infrastructure and the business environment	
Banks apply high interest rates, partly due to the low debt-recovery rate. The number of cases where a debt restructuring plan is used is insufficient.	Fully transpose the EU restructuring directive, including simplifying corporate debt restructuring through out-of-court and hybrid procedures.
A special tax regime for start-ups was implemented recently, but usage is limited.	Conduct a systematic review of the barriers that prevent more start-ups from using the special regime, and supply entrepreneurs with more information on available support measures.
The scope of SOEs is among the largest in the OECD. Inefficiencies occur due to a large number of entities that manage SOEs. SOEs do not represent a driving force for R&D investments. The use of capital markets to attract resources for investment is low.	Centralise the SOEs' ownership model. Increase participation of private investors in SOEs.
Despite recent progress, the quality of road infrastructure is well below the EU average, causing high road mortality. The government plans to upgrade most main roads by 2040.	Improve cost-benefit analysis and the selection process for new infrastructure projects, prioritising road safety.
The average commuting time is the highest in the EU, contributing to regional skills mismatches in the labour market. Congestion is concentrated around Riga city.	Establish a metropolitan transit authority, and set up transport hubs in Pieriga. Consider using congestion pricing mechanisms to minimise the use of private cars and to finance improved public transportation.
Enhancing the skills needed to boost export performance	
Demand for ICT specialists is rising fast, while ICT graduates enjoy a high wage premium. However, high dropout rates, low female participation and a paucity of young-adult programmers limit supply alignment.	Provide schools with more flexibility in setting teacher wages to address recruitment difficulties for some subjects. Supply schools with adequate teacher training in ICT. Increase careers guidance to promote more STEM studies, especially for girls. Facilitate skilled-worker immigration.
Student loans are not common despite high tuition fees. Tertiary dropout rates are high.	Boost student financial aid and provide appropriate financial incentives for tertiary institutions to increase their graduation rates.
Exports of construction services have grown rapidly, but a shortage of qualified employees risks limiting the ability of the sector to grow.	Facilitate issuing of work permits for construction employees from outside the EU, and support the adoption of digital technologies that help alleviate labour shortages.
A low level of basic digital skills is limiting the uptake of advanced digital technologies, which could overcome labour shortages in key sectors. Participation in adult education is improving, but participation in online courses is still insufficient.	Accelerate government collaboration with training providers to support the skills needed for the adoption of digital technologies. Continue cooperation with digital learning platforms to expand distance learning. Increase training for managers within small firms and SOEs.
Employer-provided training is insufficient, and many small firms do not have the capacity to provide training.	Establish training funds based on tripartite social dialogue.
Lifting R&D and innovation from their present low base	
Business R&D spending is low and has remained static in recent years, while patent applications are among the lowest in the EU; simultaneously, government support to R&D is insufficient.	Improve the financial incentives for business R&D after evaluating the impact of the 2018 corporate tax reform.
The transfer of knowledge and technology from research institutes remains limited with insufficient knowledge absorption by firms. The share of higher education institutions' funding subject to reaching performance targets is only 7%.	Increase the share of tertiary funding that is performance-based. Further consolidate existing higher education institutions. Include representatives of the private sector, including SMEs, in research institutes decision-making bodies.
Financial benefits from innovation activities for individual academic researchers are limited.	Allow academic researchers a share in royalties earned from their research.
Latvia lags the OECD average in terms of numbers of researchers, while the number of PhD graduates has fallen to a low level. Foreign researchers are scarce. The share of top performers in PISA is low.	Increase both scholarship grants and other financial support for graduate students. Introduce programmes that expose more students from underprivileged regions, backgrounds and schools to advanced curricula.

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