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Increasing the benefits
of Slovakia's integration
in global value chains

Claude Giorno

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ECONOMICS DEPARTMENT**INCREASING THE BENEFITS OF SLOVAKIA'S INTEGRATION IN GLOBAL
VALUE CHAINS****ECONOMICS DEPARTMENT WORKING PAPERS No. 1552****By Claude Giorno**

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ABSTRACT/RÉSUMÉ

Increasing the benefits of Slovakia's integration in global value chains

Heavy involvement in international trade and global value chains has been an effective way for promoting Slovakia's economic and social catch-up. Large foreign direct investment inflows have helped develop a competitive export-led manufacturing industry, with a strong specialisation in the automotive and electronics sectors, fostering robust growth and productivity performance with good fiscal and external balance results. However, the benefits of this development strategy have diminished since the 2008-09 crisis and the subsequent slowdown in world trade growth. Moreover, over the years Slovakia's integration into world trade has remained for a large part based on downstream activities of value chains that incorporate little domestic value added, such as the assembly of imported intermediate goods, and further expansion of this growth model is hindered by employers' increasing difficulties in finding skilled labour. There is a need to help local firms to better benefit from foreign companies' know-how, further prepare the workforce for the increasing digitalisation and automation of most industries, promote the diversification of the economy and, in particular, strengthen the role of the services sector. This assessment, which is derived from the first part of this chapter, is followed by a discussion of the changes required to better leverage Slovakia's experience with global value chains. All in all, a broad range of well-coordinated policies is called for. This entails better adapting the skills of the workforce to the changing needs of the labour market, enhancing the business environment, improving transport infrastructure and stimulating firms' innovation capacity.

This Working Paper relates to the *2019 OECD Economic Survey of Slovak Republic* (<http://www.oecd.org/economy/surveys/slovak-republic-economic-snapshot/>)

JEL classification: F21, F22, F62, I23

Keywords: Global value chain, productivity, infrastructure, skills, regulation

Optimiser les retombées de l'intégration de la Slovaquie dans les chaînes de valeur mondiales

La participation active de la Slovaquie aux échanges internationaux et aux chaînes de valeur mondiales a favorisé le rattrapage économique et social opéré par le pays. Les entrées importantes d'investissement direct étranger ont contribué au développement d'un secteur manufacturier compétitif et tiré par les exportations, spécialisé dans l'automobile et l'électronique, avec à la clé des résultats solides en termes de croissance et de productivité et de bonnes performances budgétaires et sur le plan du solde extérieur. Toutefois, depuis la crise de 2008-09 et le ralentissement du commerce mondial qu'elle a provoqué, cette stratégie de développement se révèle moins avantageuse. Par ailleurs, l'intégration de la Slovaquie dans le commerce mondial reste depuis plusieurs années principalement basée sur les activités situées en aval des chaînes de valeur, qui présentent une valeur ajoutée limitée au plan local, comme l'assemblage de biens intermédiaires importés. En outre, la poursuite de l'expansion de ce modèle de croissance est freinée par les difficultés grandissantes qu'ont les employeurs à recruter du personnel qualifié. Il faut aider les entreprises locales à tirer un meilleur avantage du savoir-faire des entreprises étrangères, préparer la main-d'œuvre à faire face à la montée en puissance du numérique et de l'automatisation dans la plupart des secteurs d'activité, et promouvoir la diversification de l'économie en renforçant plus particulièrement le rôle du secteur des services. Cette évaluation, principalement fondée sur la première partie du chapitre, est suivie d'un examen des réformes qu'il faudra impérativement mener pour mettre davantage à profit l'expérience de la Slovaquie au sein des chaînes de valeur mondiales. En résumé, un large éventail de mesures soigneusement coordonnées s'impose. Il convient donc d'adapter plus efficacement les compétences de la main-d'œuvre à l'évolution des besoins du marché du travail, d'optimiser l'environnement des entreprises, d'améliorer les infrastructures de transport, et de renforcer la capacité d'innovation des entreprises.

Ce Document de travail se rapporte à *l'Étude économique de l'OCDE de la Slovaquie, 2019*

Classification : F21, F22, F62, I23

Mots clefs: chaînes de valeur mondiales, productivité, infrastructure, compétences, réglementation

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Increasing the benefits of Slovakia's integration in global value chains

By Claude Giorno¹

Strong and successful integration into global value chains is positive for growth and living standards

Slovakia has benefited from its strong integration into global value chains

Integration into global value chains (GVCs) offers opportunities for a rapid economic and social catch-up to an emerging economy like Slovakia. Integration into GVCs can boost productivity through a more efficient international division of labour. They also generate greater economies of scale and efficiency for small economies by increasing access to external markets and underpinning exports. In principle, intensive participation in GVCs, based on inward direct investments, can also foster productivity gains across the economy through knowledge spillovers from multinational enterprises.

Slovakia's increased participation in GVCs in recent decades has led to a sharp increase in external trade as shown by a gross export and import decomposition using the OECD-WTO Trade-in-Value Added database (Box 1) (Figure 1). As a result, the country's openness has increased steadily, with the average GDP share of imports and exports exceeding 90% in 2016-17 (Panel B).

Box 1. Integration into GVCs - Terminology of some statistical indicators

The growth of international trade in recent decades has to a large extent been stimulated by the development of global value chains (GVCs). To measure the extent and nature of this phenomenon in OECD countries, new statistical indicators were elaborated using the OECD-WTO Trade in Value Added Database. This box provides some explanation of some of these indicators and their terminology, which are used in various places in this chapter. By measuring gross exports in terms of added value, these indicators can in particular be used to decompose gross exports into the following four components as shown in Figure 1 and quantified in the case of Slovakia in Figure 2:

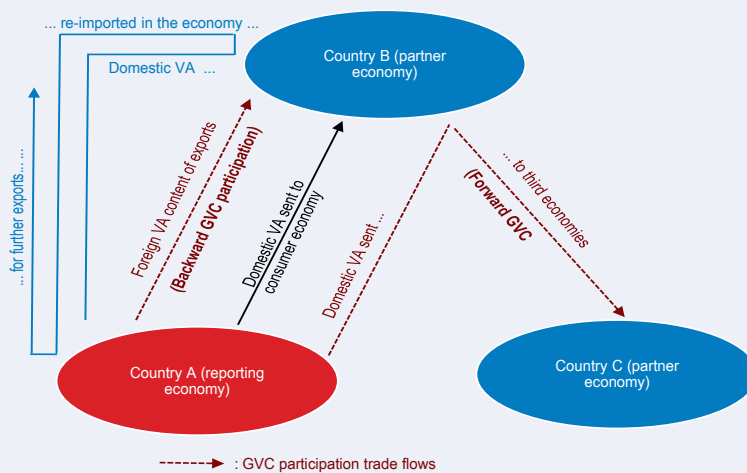
- Domestic value added sold to the consumer economy. It represents the domestic value added embodied either in final or intermediate goods or services that is directly consumed by importing economies.

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- Forward GVC participation. It is the domestic value added contained in the intermediate goods or services exported to an economy that is then re-exported to a third economy.
- Backward GVC participation or foreign value added content of exports. This indicator represents the value added of imported inputs embodied in exported goods and services.
- Re-imported domestic added value. It is the domestic value added embodied in exports of intermediate inputs that is imported back, for example, as part of final goods or services. This component is usually much smaller than the other three components (It is thus not visible in Figure 2).

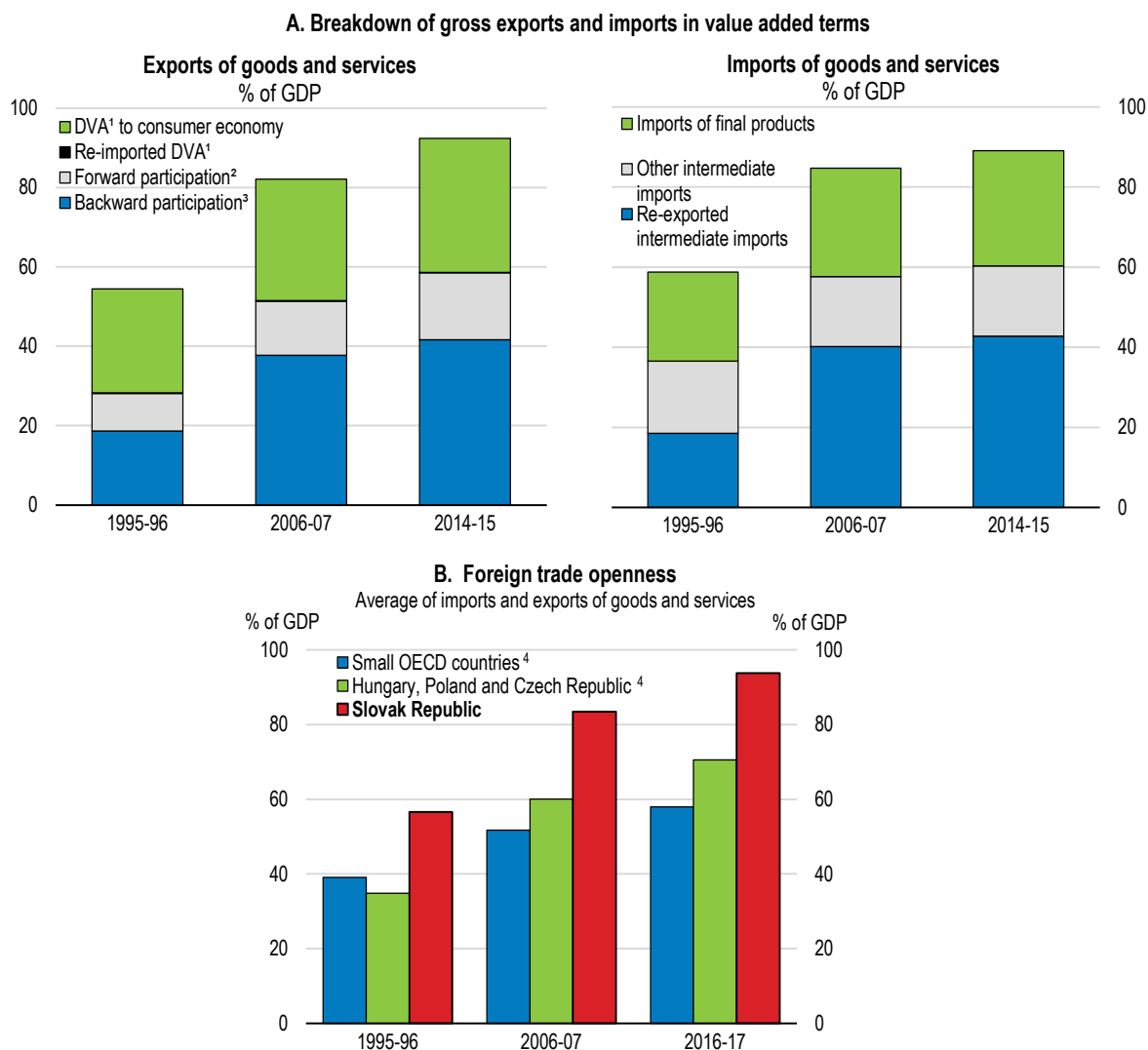
An economy's participation in GVCs is measured by the sum of the two components of backward and forward participation. By convention, individual economies are indeed assumed to participate in GVCs either by importing foreign inputs to produce goods and services for export (backward GVC participation) or by exporting domestically produced inputs to partners responsible for downstream production stages (forward GVC participation).

Figure 1. A visualization of the value added components of gross exports and GVC trade flows



Source: OECD-WTO TiVA Database.

Figure 2. Rising integration in GVCs has boosted foreign trade openness



1. Domestic Value Added.

2. Forward participation is measured by domestic value added embodied in foreign exports as share of gross exports of the source country.

3. Backward participation is measured by the foreign value added content of exports as a share of gross exports.

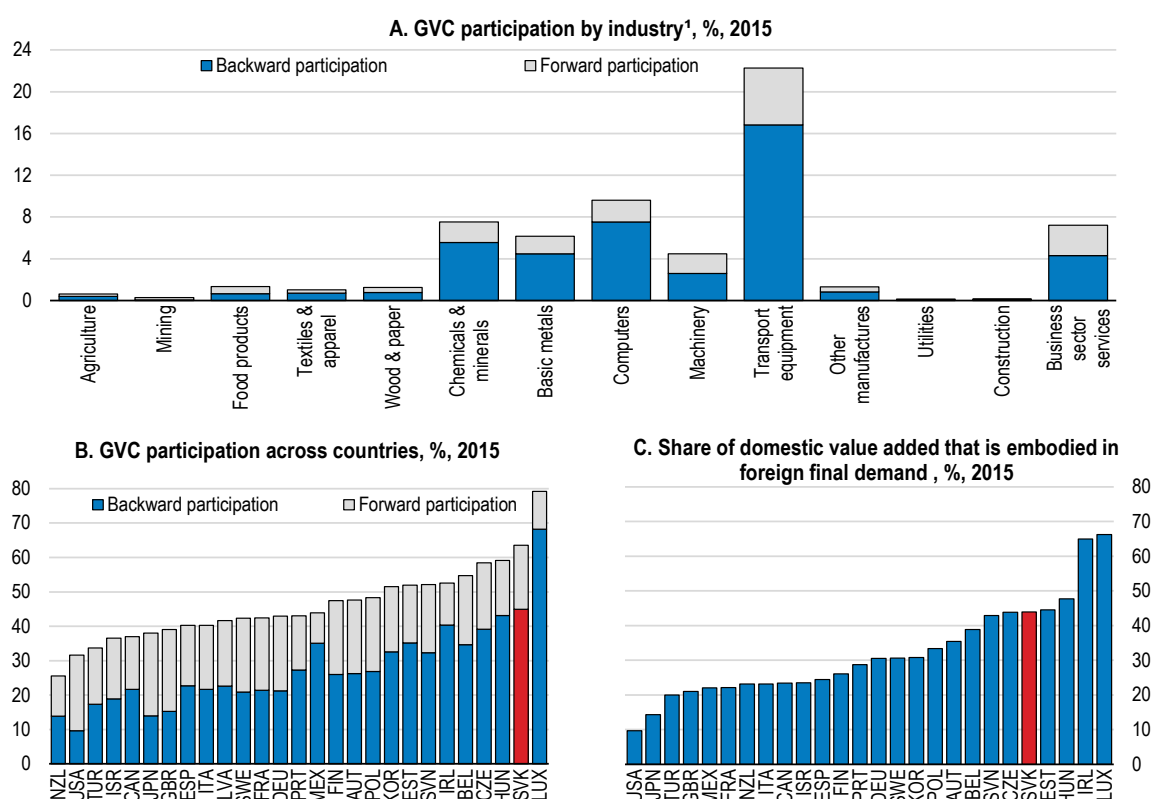
4. Unweighted average.

Source: Calculations based on OECD-WTO Trade in Value Added (TiVA) Database; OECD TiVA nowcasted estimates Database and OECD Economic Outlook Database.

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Slovakia's participation in GVCs is particularly prevalent in the manufacturing sector, especially in the transport and electronic equipment industries (Figure 3, Panel A). It is also characterised by a high proportion of foreign inputs in exports, whereas the use of Slovak inputs in other countries' exports is low, as is also the case in other small economies (Panel B). This indicates that Slovakia's role in GVCs is more about assembling imported inputs than supplying parts and components to other GVC participants. In 2015, 45% of Slovak GDP depended on foreign demand, which is high by international standards (Panel C).

Figure 3. Slovak participation in GVCs is high, especially in manufacturing



Note: The indicator at the industry level is expressed relative to total country exports.

Source: Calculations based on OECD-WTO Trade in Value Added (TiVA) Database.

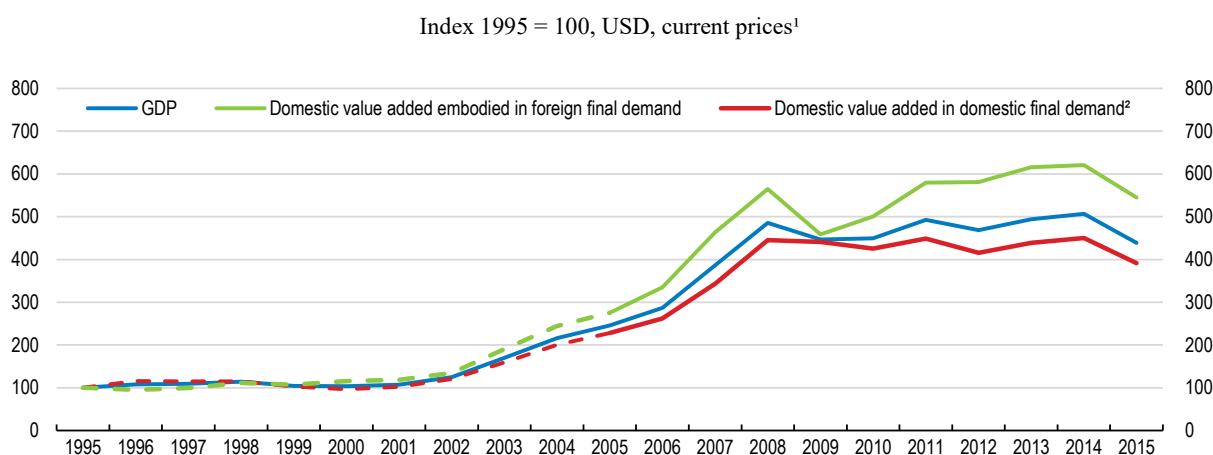
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This rapid integration into GVCs has mainly resulted from large inflows of foreign direct investments (FDI) (Vladová, A., 2017a). The FDI stock represented 54% of GDP in 2015, i.e. 0.28% of the total FDI stock in the OECD, which far exceeds Slovakia's weight in terms of OECD GDP (0.17%). Several factors have contributed to this trend: the country's advantageous geographic location in the heart of Europe; the availability of a low-cost but skilled labour force; its euro membership since 2009; all combined with a cautious budgetary and financial policy, which has helped preserve both a stable economic and social environment and strong competitiveness. Thanks to these FDI inflows, mainly from the European Union (particularly Germany) and to a lesser extent from the rest of the world (notably Korea, United States), the Slovak economy has become a significant export platform mainly through its integration into European GVCs. In total, foreign multinationals accounted for 22% of private employment in 2015, and 35% of Slovak private-sector value added excluding agriculture and finance (OECD, 2017a). In the key electronics and automotive industries, the proportion of employment and value added generated by foreign multinationals is between 80% and 95%.

This increased involvement in world trade has generated significant benefits. It has acted as a driving force for the economy, and this has been reflected in the strength of exports and the creation of value added from foreign demand since 1995, despite the effects of the 2008-09 crisis (Figure 4). The sectors that are the most integrated into GVCs, and therefore the most export-focused, have developed comparative advantages, which have

led to productivity gains that are stronger than in other sectors and other OECD countries (Figure 5) (Miroudot and Cadestin, 2017a; Berthou et al., 2015). This has helped Slovak GDP per capita to gain significant ground on the more advanced countries, with a positive impact on employment, the public accounts and the external balance (Luptáčík et al., 2013).

Figure 4. Increased integration in world trade has strengthened the economy



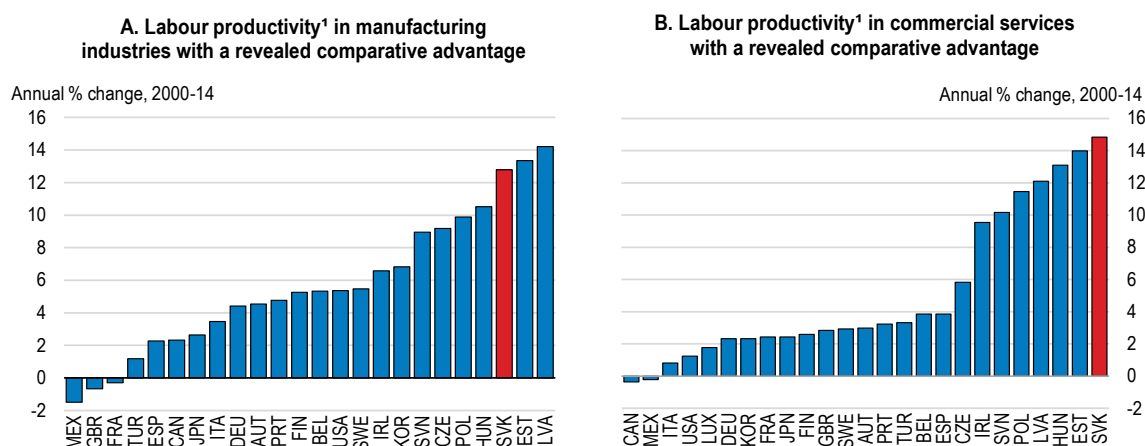
1. There is a break in time series for domestic value added in foreign final demand as well as in domestic final demand from 2004 to 2005 as the data from 2005 onwards have been revised. Growth rates for 2005 onwards have been applied to the time series 1995 to 2005.

2. Value added in domestic final demand is calculated as total value added minus domestic value added embodied in foreign final demand.

Source: OECD Economic Outlook Database and OECD Trade in Value Added (TiVA) Database.

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Figure 5. High participation in GVCs has boosted productivity



Note: Value added and employment data for industries with a RCA in value-added terms above 1 in 2014 are summed for each country to obtain the average growth in employment, value added and productivity. Manufacturing does not include mining and utilities.

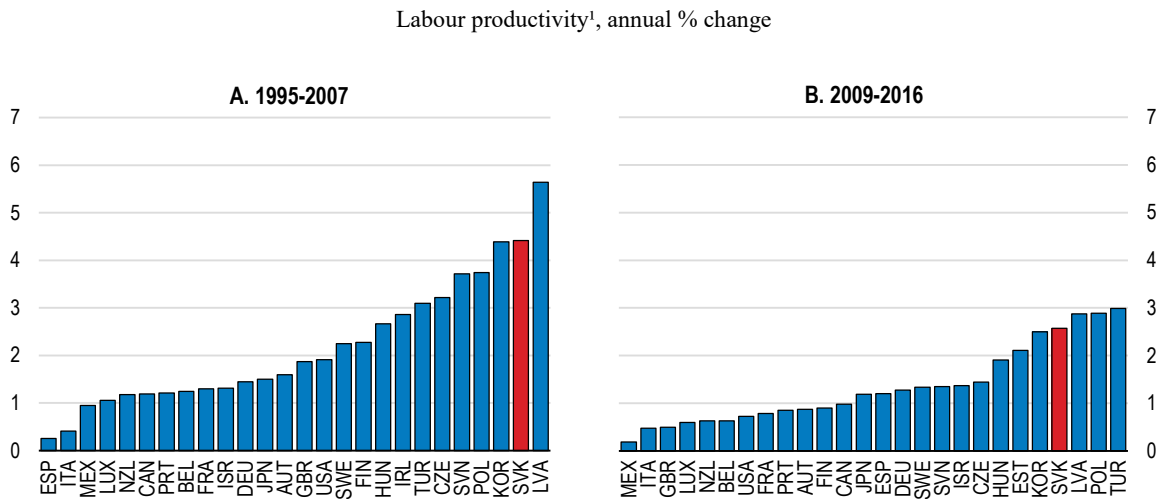
Source: Miroudot, S. and C. Cadestin (2017), "Services in Global value Chains: Trade patterns and gains from specialisation", OECD Trade Policy Papers, No. 208, OECD Publishing, Paris; OECD STAN Database;

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The benefits of the integration process have fallen since the 2008-09 crisis

The very fast growth in productivity until 2007-08 has slowed significantly ever since, even if it remains high by international standards (Figure 6). The slowdown in the globalisation process since the crisis, reflected in the reduced growth of international trade (Haugh et al., 2016), has been accompanied by a deceleration in Slovak integration into GVCs (Figure 7, Panel A), which seems to be partially connected to a marked downturn in FDI inflows (Panel B).

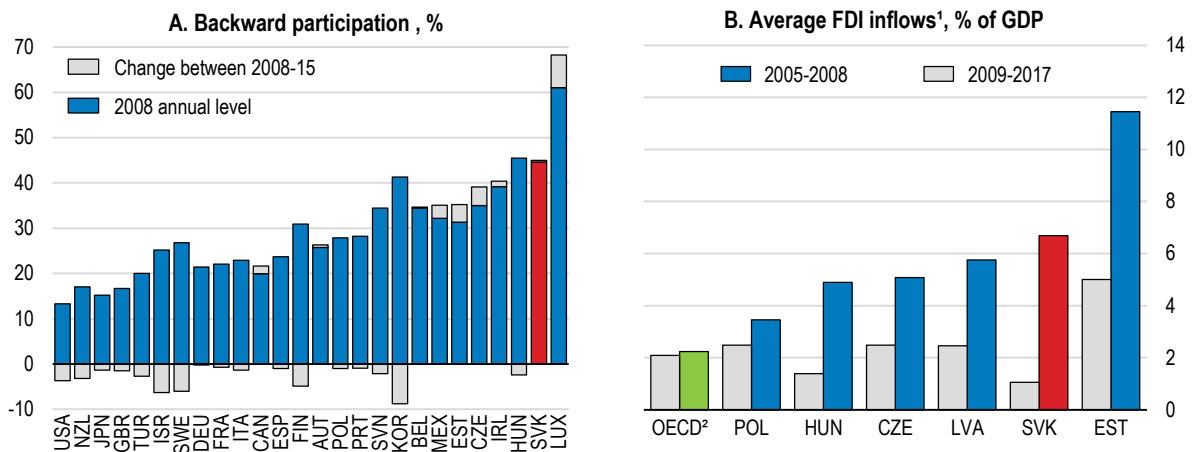
Figure 6. Labour productivity gains have decelerated since the global financial crisis



Note: Labour productivity is measured by GDP per hour worked (constant prices).
Source: OECD Productivity Database.

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Figure 7. FDI inflows and participation in GVCs have weakened since the crisis



1. Data are excluding resident SPEs (special purpose entities) when available.
2. Average of OECD countries without Iceland, Ireland and Luxembourg.
Source: OECD-WTO Trade in Value Added (TiVA) Database; and OECD International Direct Investment Statistics Database.

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In addition, the growing difficulties of foreign firms in finding a skilled labour force could limit the benefits that Slovakia could derive from its participation in GVCs in the future. According to recent surveys, 90% of automotive firms consider that the lack of skilled labour is the main obstacle preventing them from increasing their direct investment in the country (PwC, 2017). Rising labour costs, including those for low-skilled labour, also seems to have led to rationalisation efforts in the electronics sector where companies, most of which are foreign, reduced their workforce by over a third between 2009 and 2016, and where plant closures have recently been announced (OECD, 2018a; Dennik, 2018). These developments suggest that the benefits of the Slovak growth model of recent years might be shrinking, and that the country now needs to strengthen its own capacity to innovate and adopt new technologies to continue to allow for a catch-up in incomes and wages. In the longer term Slovakia could also suffer from its poor demographic prospects, which are set to be shaped by a sharp population ageing (OECD, 2017b).

Another, more general, source of concern is the future development of GVCs. Progress in digitalisation technologies with the Internet of things, Big Data, the cloud, autonomous robots and 3D printing could permanently slow GVC expansion (Baldwin, 2016). These technologies will facilitate cheaper, higher quality and better tailored production in the advanced economies, thus reducing labour costs and leading, under some scenarios, to a relocation of the production process and a reduction in the intensity of international exchange (De Backer and Flaig, 2017). This phenomenon could also be exacerbated by more protectionist trade policies. To date, however, empirical assessments point to only a modest relocation, even if a shift in GVCs to a more regional level has been observed (De Backer et al., 2016). Slovakia's firm roots in neighbouring European GVCs could moreover be an asset for the country. New investments in the automotive sector in 2016-17 show that the country continues to attract European multinationals.

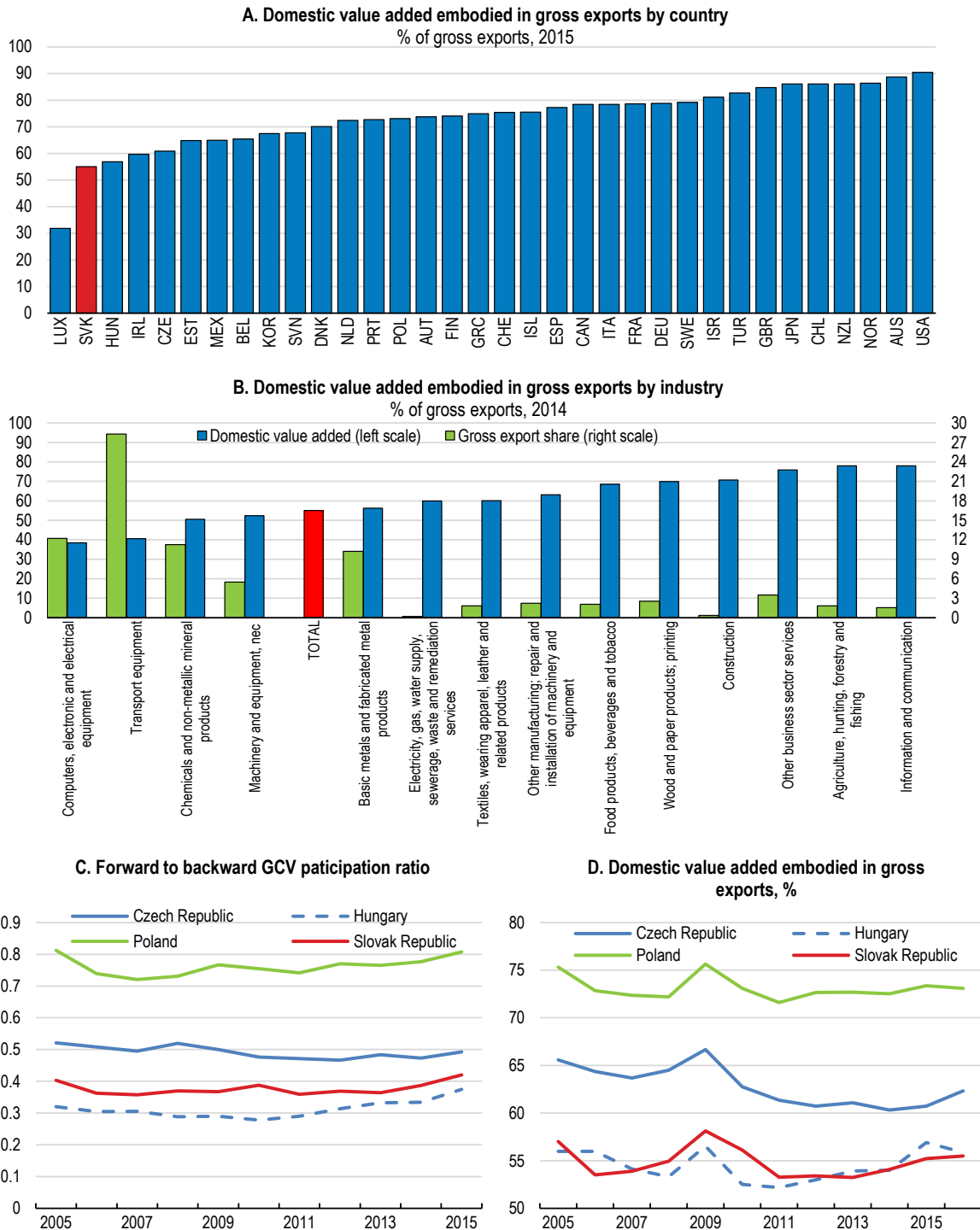
An improvement in the quality of Slovakia's role in GVCs would be useful

Slovakia's benefits from participating in GVCs are limited by its downstream positioning in value chains

While FDI inflows into Slovakia have certainly helped develop a more competitive, export-focused manufacturing industry, the extensive use of imported intermediate inputs in Slovakia's exports implies that the proportion of domestic value added in its exports is low by international standards, as in the case in the other Central European countries (Damjanovic and Banerjee, 2018) (Figure 8, Panel A). This situation reflects the Slovak economy's positioning on markets such as the assembly of imported intermediate inputs, which tends to be a low value-added GVC activity (Vladová, 2017a) (Panel B). About 40% of Slovakia's imports are intermediate goods that are embodied in its exports (OECD, 2015b). Accordingly, the country only enjoys some of the benefits of the strong gains in export market share since the end of the 1990s, which are mostly attributable to the entry of multinationals into the automotive and electronic equipment sectors. Multinational companies established in Slovakia employ only a limited labour force. In the automotive sector, moreover, Slovakia's positioning downstream in the value chain has hardly changed over recent years (De Backer and Miroudot, 2013) (Box 2.2). During the early 2000s, the VAX ratio, which measures the share of domestic value added in gross exports, has declined significantly, partly due to compositional changes in exports towards more manufacturing (Banerjee and Zeman, 2019). However, since 2005, the VAX ratio, as well as the ratio between forward and backward GVC participation have

remained stable, indicating that Slovakia's position in GVCs have not significantly changed over this period (Panel C, D).

Figure 8. Domestic value added in exports is relatively low and stable



Source: OECD-WTO Trade in Value Added (TiVA) Database.

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Box 2. The development of the Slovak automotive sector

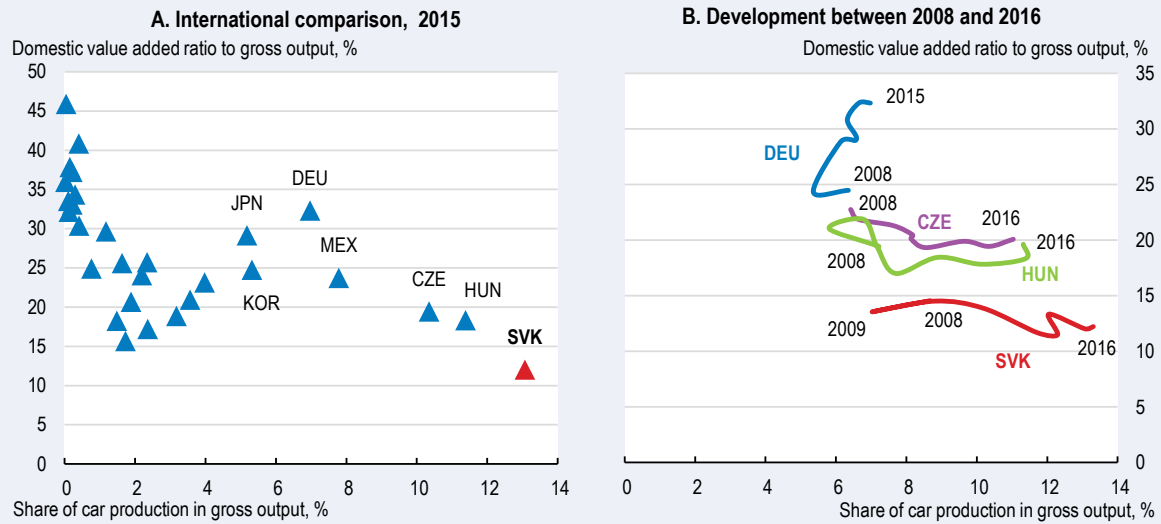
As the OECD's 2017 Economic Survey indicated, the automotive sector has been one of the key factors behind the strong growth of the Slovak economy in recent decades (OECD, 2017b). Over the past ten years there has been over a fivefold increase in the number of cars produced to one million vehicles a year, making the country the leading per capita car producer in the world. The starting point for the development of the sector was the arrival of several large foreign manufacturers (German as of 1993, Korean and French in 2006, British in 2016/17), whose investments and production have had significant direct and indirect benefits on the economy. The automotive industry alone generated one third of exports and 13% of the country's gross output in 2015, which is high by international standards. Moreover, the value added share of this sector, taking into account its indirect positive effects on the economy evaluated with input-output matrices, amounted to 11% of GDP (Luptáčík et al., 2013).

Nevertheless, the value added directly produced by the automotive industry (excluding its indirect effects) reached only 4% of GDP and the ratio of value added to gross output is, at 12%, lower than in other OECD countries (Figure 9, Panel A). Also, this ratio fell slightly between 2008 and 2015, despite a doubling of production in the Slovak automotive sector over the period (Panel B). Slovakia's positioning in this value chain, like Hungary's and the Czech Republic's, therefore seems to have barely improved, even if the increase in the size of the sector was accompanied by sharp productivity gains (Figure 10). This situation contrasts with the qualitative improvement registered by the German automotive industry over the same period: while car production remained at about 6% of total gross output in Germany between 2008 and 2015, productivity gains in the sector over this period were accompanied by an increase in the ratio of value-added to gross output from 25% to 32% (Vladová, 2017b).

In total, stronger exports and Slovakia's comparative advantage in the automotive sector have reflected a more quantitative than qualitative progression. In addition, further expansion is being hampered by growing difficulties due, in the short term, to a lack of skilled manpower to meet demand in the sector and, potentially in the longer term, to the need to adjust the expertise of this workforce to cope with foreseeable technological developments in the industry.

Ongoing radical changes in the automotive sector, which could see the development of electric cars, hydrogen-powered cars, autonomous cars, shared and connected or even flying cars, pose significant challenges for manufacturers and for the organisation of their value chains (PwC, 2018). Economic history teaches that significant technological changes can strongly alter the functioning and structure of certain sectors. In the IT sector, for example, the emergence of microcomputer technology has had major consequences for the organisation of the electronics industry with the emergence of new players and the weakening of previously dominant companies, such as IBM, whose market share in the overall computer industry declined from 60% in 1970 to 32% in 1980 (Burton, 1983).

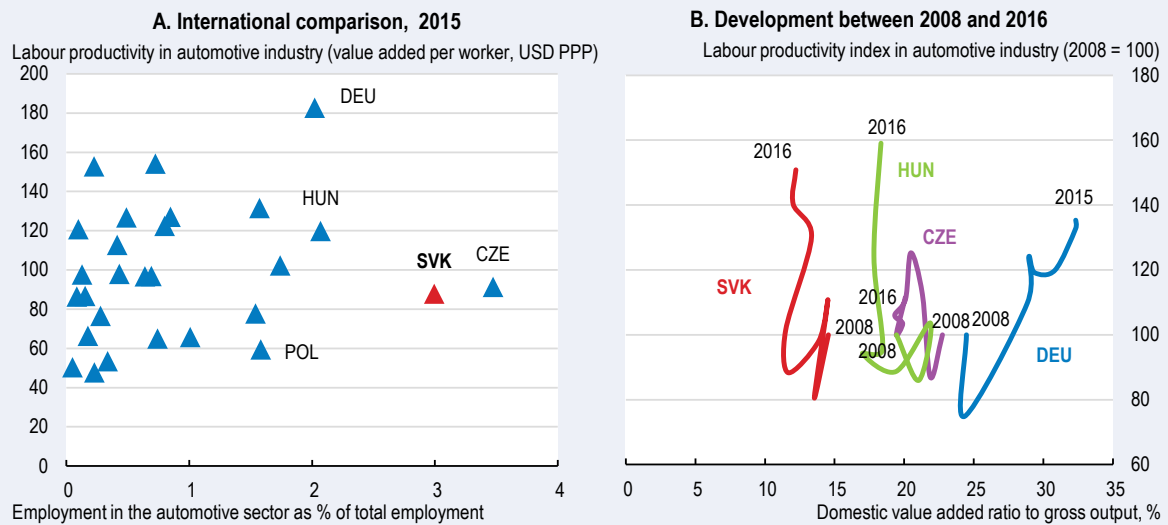
Figure 9. Ratio of domestic value added to gross output has remained weak in the automotive industry



Source: OECD STAN Database.

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Figure 10. Productivity in the automotive industry has improved sharply



Source: OECD STAN Database.

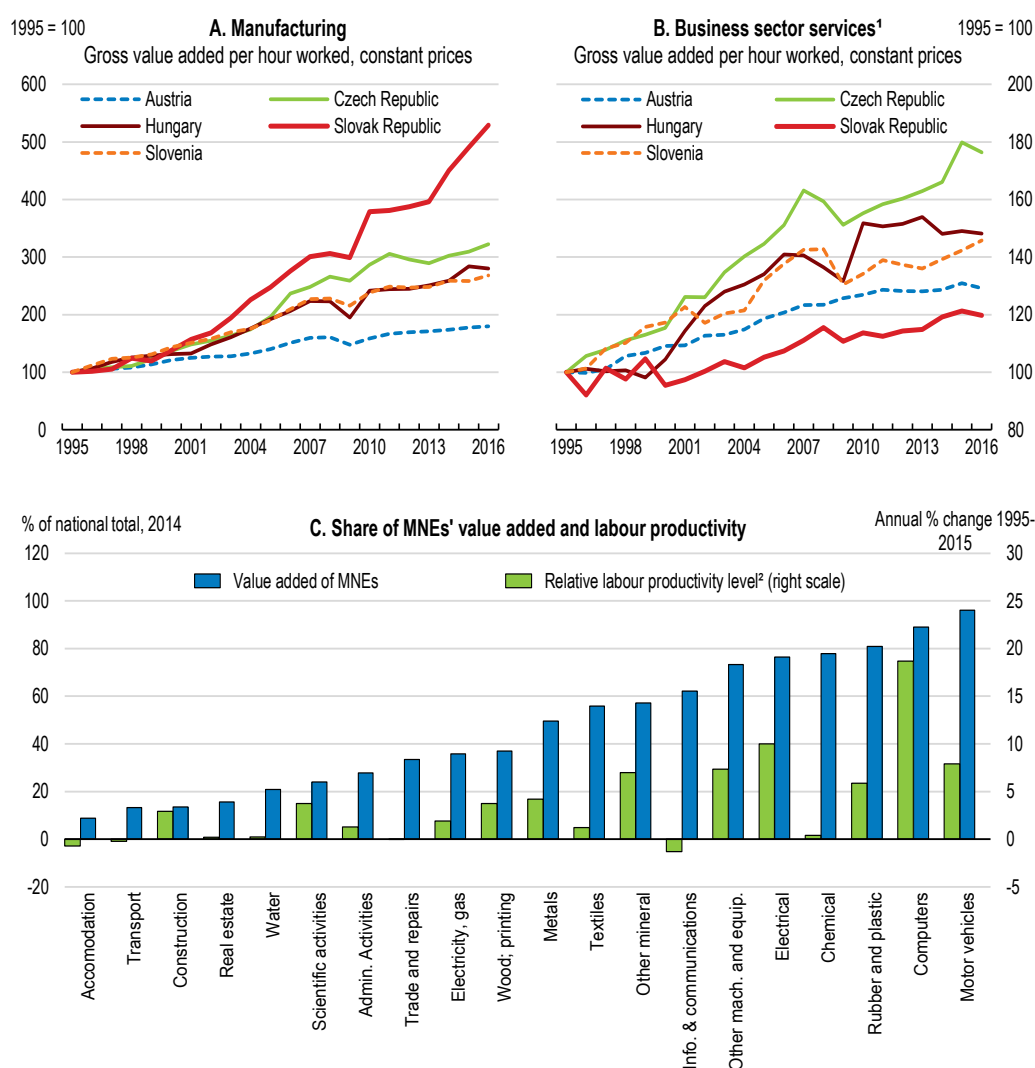
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Local firms seem to have reaped little benefit from foreign company know-how

Slovakia could make better use of the presence of foreign enterprises to strengthen the extension to local businesses of their technological know-how and/or management expertise. Indeed, local businesses seem to have reaped little benefit to date from the impact of this type of spillovers. The productivity catch-up of the Slovak economy to the

more advanced countries has varied enormously between sectors and seems to be strongly connected to efficiency gains directly generated by the arrival of large multinationals (Muzikarova, 2018). The productivity convergence process has been concentrated in manufacturing, where these multinationals are particularly present (Figure 11, Panel A and C). On the other hand, the productivity gap in the services sector has not closed, perhaps due to the lack of inward FDI (Panel B).

Figure 11. Productivity gains have been very modest in the services sectors



1. Excluding real estate.

2. Ratio of Slovak Republic to a simple average of the following countries: Austria, France, Germany and United Kingdom. Labour productivity is measured as GDP per worker in constant 2010 PPPs.

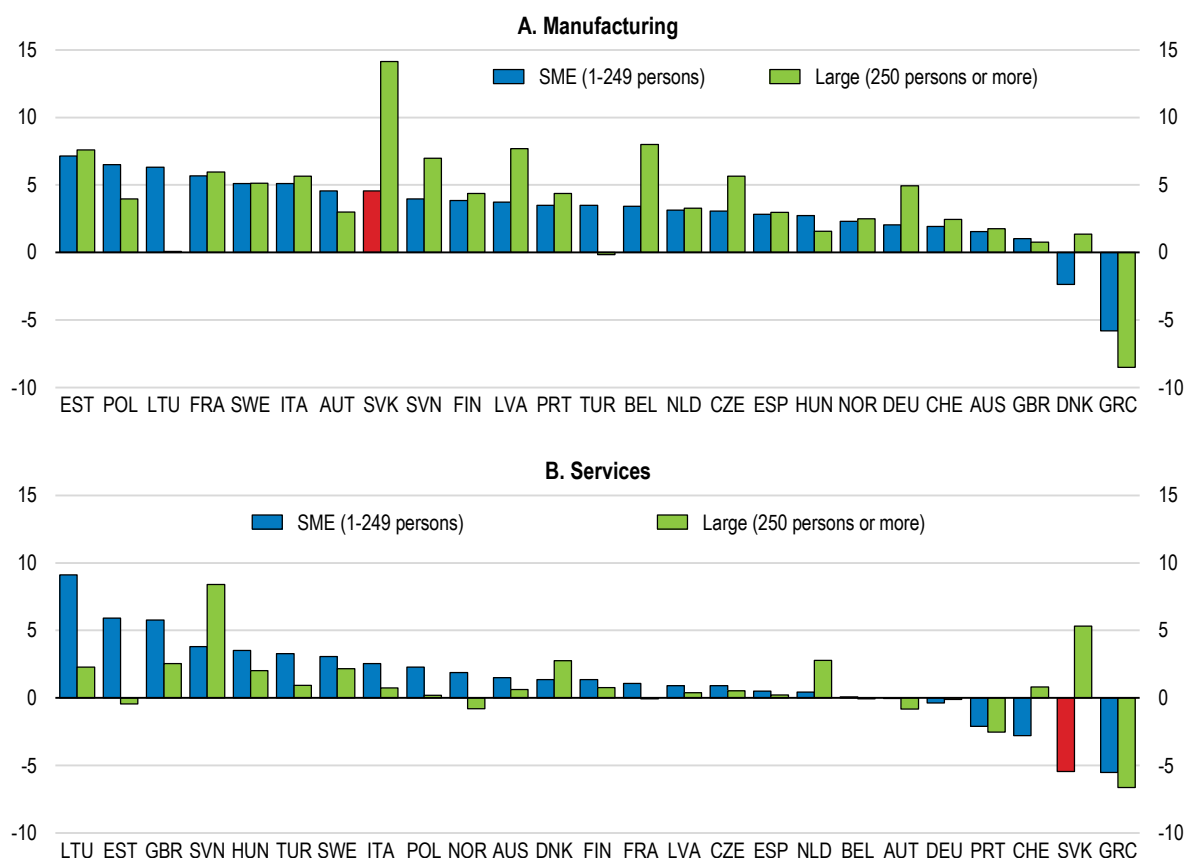
Source: OECD Productivity Database; OECD Activity of Multinational Enterprises Database; OECD STAN Database.

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Since 2009 there has also been a particularly pronounced divergence in productivity performance between large companies, many of them being foreign, and SMEs, which are most often local firms (Figure 12). An analysis carried out on firm-level data tends to confirm such development (Muzikarova, 2018).

Figure 12. Productivity gains have been much stronger in large firms than SMEs

Real value added per person employed, average annual rate, %, 2009-14 or latest available year

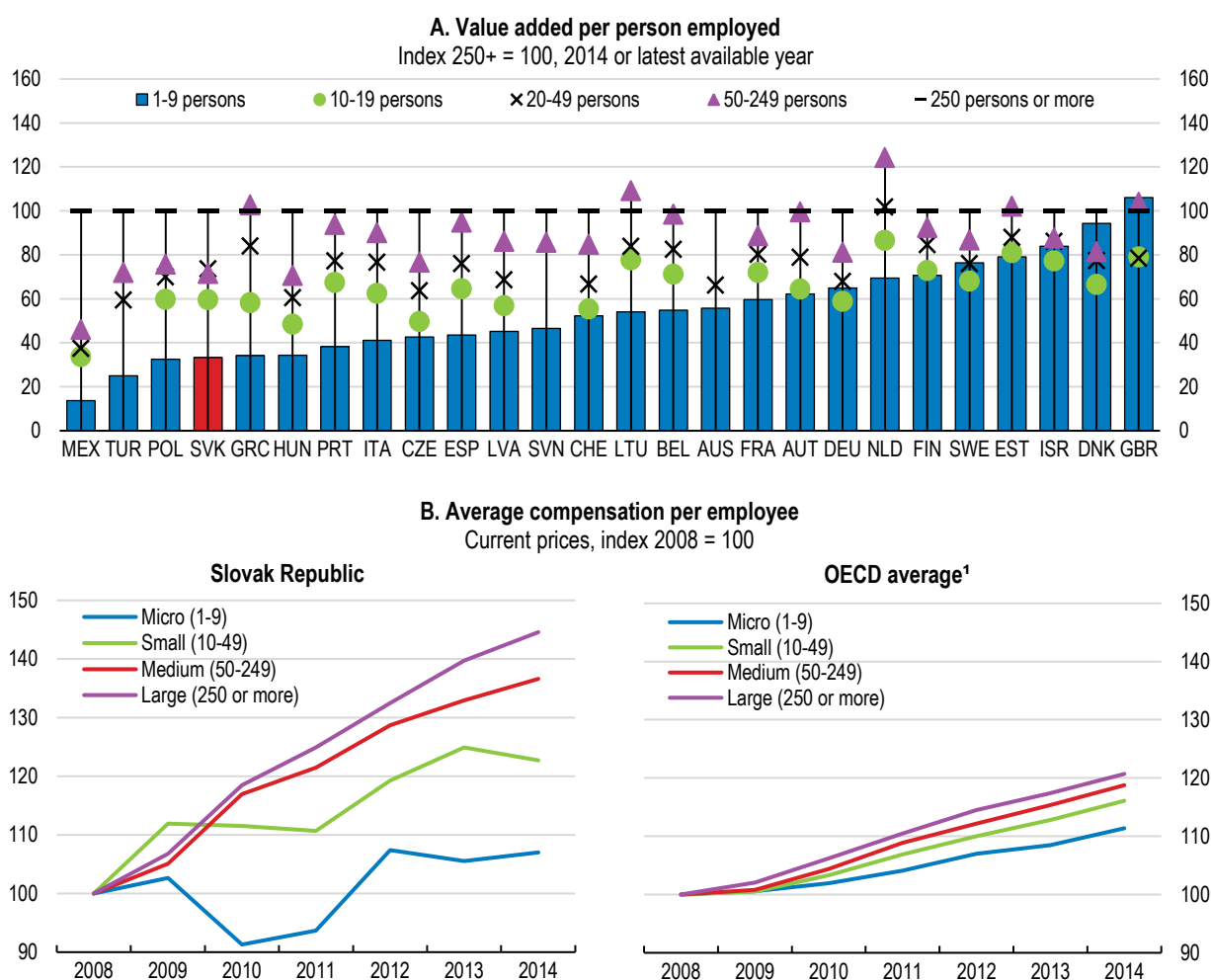


Source: OECD (2017), *Entrepreneurship at a Glance 2017*, OECD Publishing, Paris.

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Overall, the Slovak economy is characterised by a very heterogeneous industrial fabric where a small number of very efficient foreign enterprises rub shoulders with a large number of not very productive local businesses. The ten largest exporters, all of which are foreign, account for 40% of total exports compared to 20% to 30% in other small countries, including Sweden, Slovenia and Portugal (OECD, 2017c). Empirical research suggests that two-thirds of companies in Slovakia produce only one third of the total value added, and their workers have half the productivity of their remaining most productive counterparts (Vyskrabka, 2018). The disparity in productivity between small and large enterprises is higher than in most other OECD countries, and this widening gap is reflected in wage developments (Figure 13). Between 2009 and 2016 the difference between the average salary of workers in businesses with over 250 employees and that in those with up to nine employees increased by 40%, i.e. much more than in other OECD countries. Significant potential sources of efficiency could thus be better harnessed by encouraging local firms to modernise and facilitating the reallocation of resources to the most efficient among them.

Figure 13. There are large productivity gaps and rising wage disparities between small and large firms



Note: Average for available OECD countries.

Source: OECD (2017), *Entrepreneurship at a Glance 2017*, OECD Publishing, Paris.

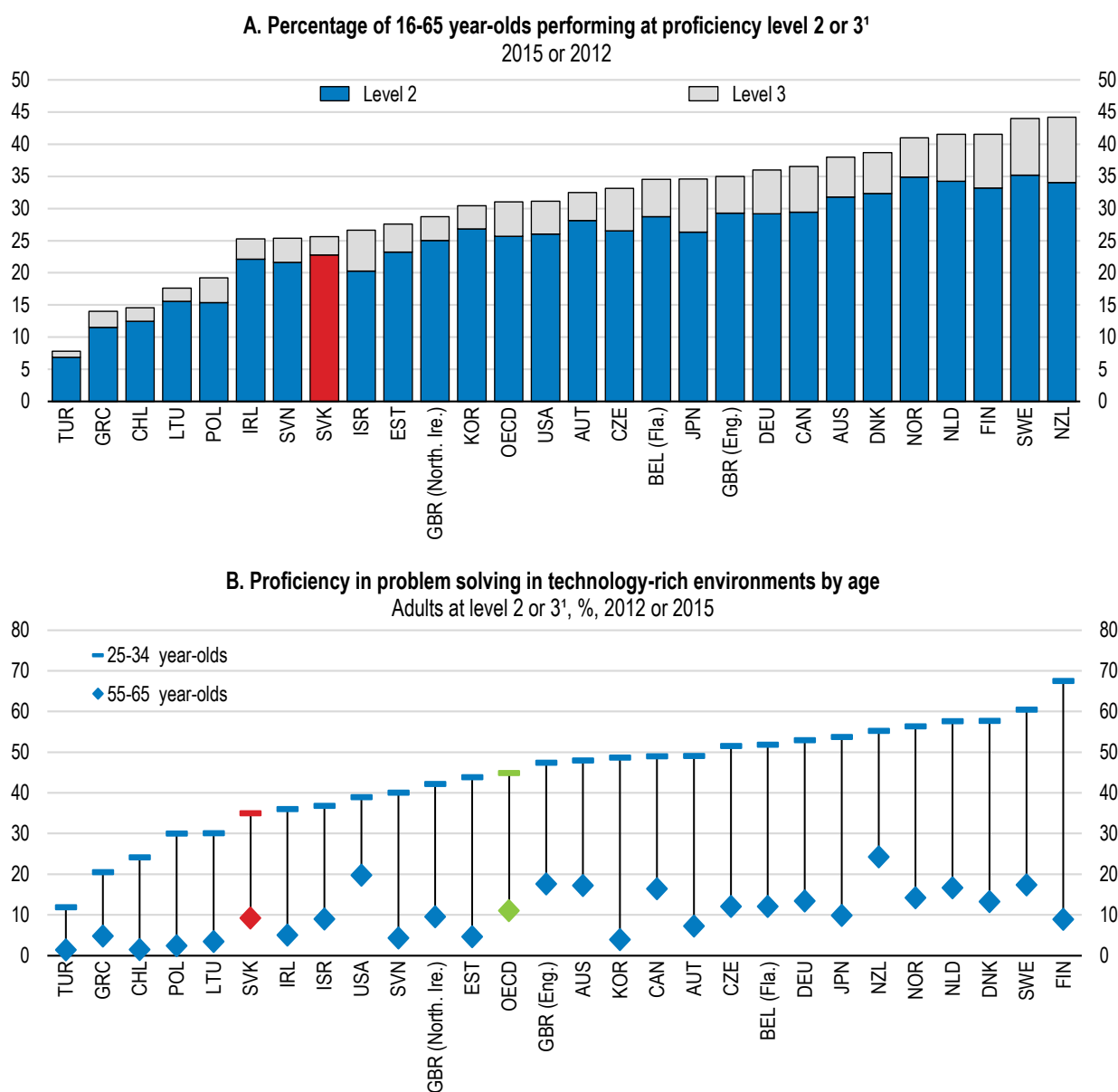
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The country seems insufficiently prepared for the increasing digitalisation and automation of the economy

The Slovak workforce does not seem sufficiently prepared for the digital expansion in the economy, neither qualitatively nor quantitatively. Only one-fifth of workers have the advanced cognitive skills required to assess problems and find solutions in technology-rich environments (Figure 14). In addition, there is an acute shortage of qualified workers in ICT, computers and electronics industries (OECD, 2017d). According to employers in the IT sector, 10 000 additional specialists (i.e. 14% of employment in the sector) are required, with this figure predicted to double in the next five years (Itas, 2016; Liptáková, 2017). Slovakia also seems vulnerable to the expected increase in automation, as growing demand for highly skilled labour is expected to replace the many predominantly medium-skilled jobs currently required for routine tasks (Figure 15). Adapting the competencies of

the workforce to these technological changes is necessary to benefit from them in terms of productivity and growth, and to boost wages and incomes.

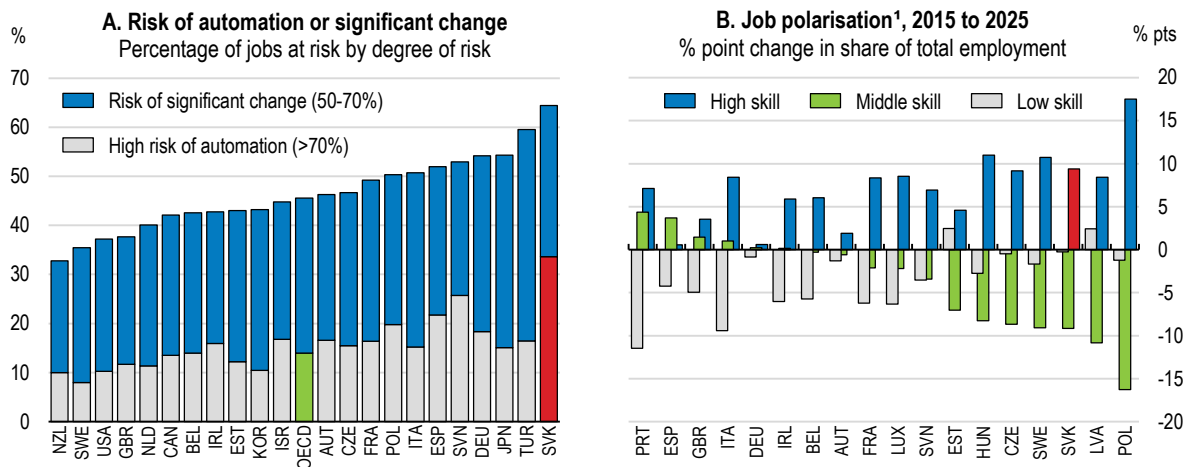
Figure 14. Proficiency in problem solving in technology-rich environments is relatively low



Note: Unlike individuals in level 1 those in level 2 and 3 have advanced ICT and cognitive skills to evaluate problems and solutions.
Source: OECD (2016), *Skills Matter: Further Results from the Survey of Adult Skills*, OECD Publishing, Paris.

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Figure 15. Slovakia's employment looks vulnerable to the likely increase in automation



Note: High-skill occupations include jobs classified under the ISCO-88 major groups 1, 2, and 3. Middle-skill occupations include jobs classified under the ISCO-88 major groups 4, 7, and 8. Low-skill occupations include jobs classified under the ISCO-88 major groups 5 and 9. The above chart includes 15 of the 18 listed industries. The excluded industries are the following: Agriculture, hunting, forestry and fishing (1), Mining and quarrying (2), and Community, social and personal services (18).

Source: L. Nedelkoska and G. Quintini (2018), "Automation, skills use and training", *OECD Social, Employment and Migration Working Papers*, No. 202, OECD Publishing, Paris. <http://dx.doi.org/10.1787/2e2f4eca-en>; European Centre for the Development of Vocational Training (Cedefop) (2017), *Forecasting skill demand and supply*, <http://www.cedefop.europa.eu/en/events-and-projects/projects/forecasting-skill-demand-and-supply/>.

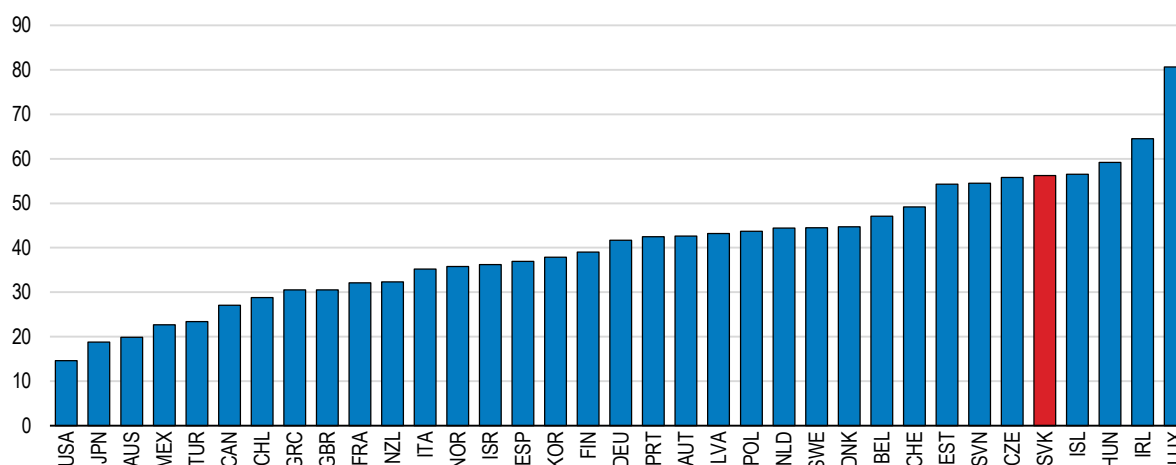
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Production and exports are concentrated in very few manufacturing industries

Although it may be difficult for Slovakia, like other small countries, to avoid a certain degree of specialisation, it would be useful to promote a greater diversification of the economy. Production and exports are characterised by a high degree of concentration in a limited number of sectors, notably the electronic and automotive industries (Vladová, 2017b). Slovakia's two leading export products represented 41% of goods exported in 2017 compared to an average of 24% for small European countries and 30% in the Czech Republic and Hungary. By creating agglomerations and successful industrial clusters in the automotive sector, this specialisation increased the country's appeal in this field, which in turn boosted specialisation in recent decades, and eventually made it a source of vulnerability. Slovakia's exposure in terms of output and employment (Figure 16) to fluctuations in world trade and external shocks is coupled with a strong dependence on a few sectors in which, moreover, sweeping technological transformations are expected in the not-too-distant future (McKinsey, 2017; PwC, 2018).

Figure 16. Slovak employment is strongly dependent on foreign final demand

Share of domestic employment embodied in foreign final demand, %, total economy, 2014



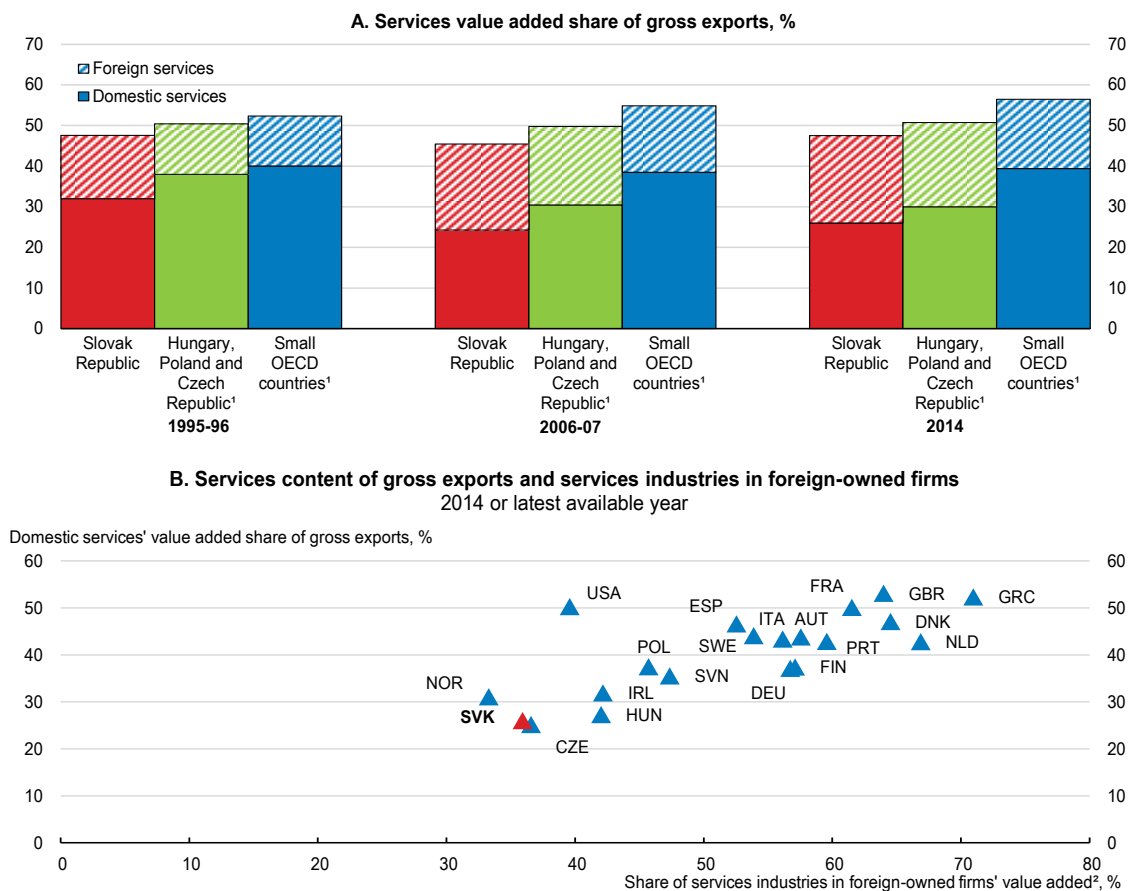
Source: OECD (2017), Science, Technology and Industry Scoreboard 2017.

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The heavy concentration of the production structure is partly related to the poor development of services in the economy. The extension of the role of services as a source of productivity gains and value creation in GVCs in most OECD countries (Miroudot and Cadestin, 2017b) has benefited Slovak enterprises rather little so far. The share of the domestic services value added embodied in total exports is substantially weaker than in the small OECD countries average (Figure 17, Panel A). This comparatively limited integration of Slovak domestic services in GVCs appears to be linked to the low level of FDI inflows in the sector (Panel B), but probably also to the local SMEs' difficulties in acquiring foreign companies' know-how, as mentioned above.

The economy would stand to gain from the promotion of a more diversified production structure, which encourages the development of services and highly knowledge-intensive activities, and this would reduce its vulnerability to the conditions on, and shocks to, global markets. Slovakia seems to be well equipped to broaden the structure of its exports by product and to diversify its production system. In 2016 it ranked 19th worldwide in the Economic Complexity Index, which measures countries' relative knowledge intensity (Hausmann and Hidalgo, 2010; Observatory of Economic Complexity, 2018). From this point of view, the recent development of shared services centres, which execute and manage specific operational tasks (finance, accounting, IT support, etc.) for several businesses or divisions within a single group, seems especially promising (Chovanec, 2018). FDI inflows into the services sectors have risen since 2009, and since 2000 Slovakia has registered the emergence and/or strengthening of comparative advantages in some services sectors, including the transport, engineering and technical trials and telecommunications sectors, which have recorded productivity and employment gains (Miroudot and Cadestin, 2017a).

Figure 17. Integration of Slovak domestic services in GVCs is low



1. Unweighted average.

2. Excluding financial and insurance services.

Source: OECD Activity of Multinational Enterprises Database; OECD-WTO Trade in Value Added (TiVA) Database; TiVA nowcasted estimates Database.

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Promoting policies designed to increase and leverage integration into GVCs

A broad range of well-coordinated reforms is needed

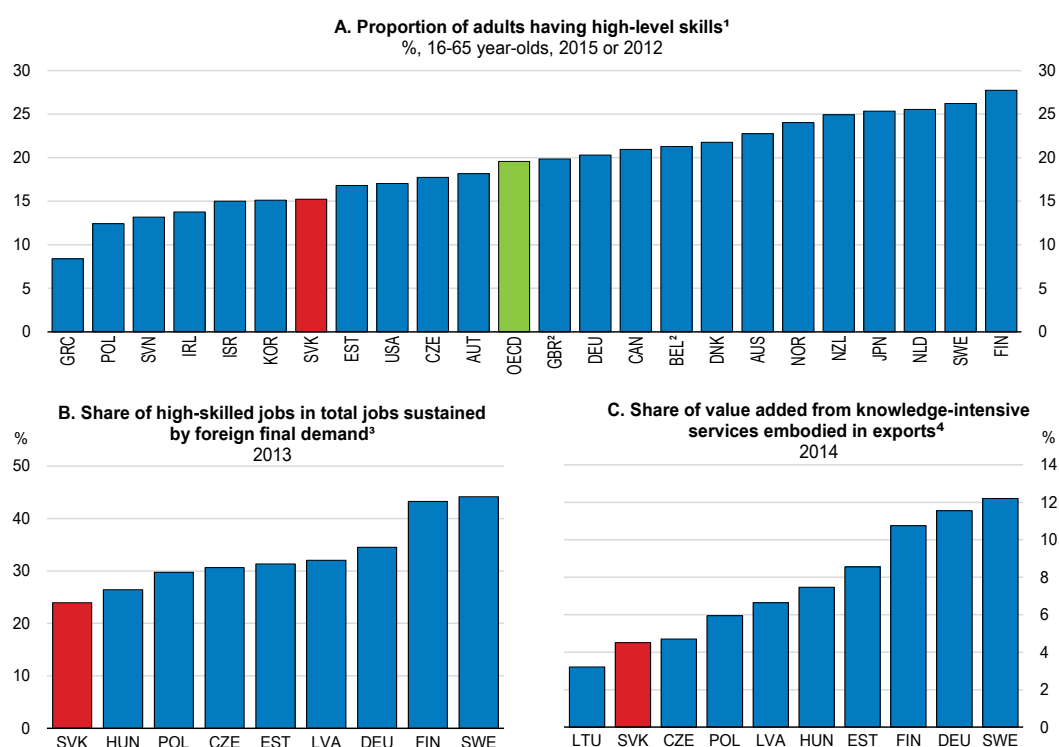
Although Slovakia's integration into global trade in recent decades has produced remarkable results, reforms are needed to improve the quality of this integration, correct certain imbalances and prepare the country for future changes in the international environment. The authorities should encourage the development of more diverse activities with greater added value by attracting new foreign investment and fostering the development of local businesses. To capitalise on the country's close connection to international markets, decision-makers must continue to nurture the business environment and strengthen policies that promote the dissemination of knowledge and the attraction and retention of highly skilled workers. It will also be important to ensure that the skills of the labour force are better matched to the constantly evolving needs of the labour market, stimulate businesses' innovation capacity and promote greater efficiency in the allocation of resources in the economy. To leverage the benefits from global value chains, a wide range of well-coordinated public policies should be encouraged, and this will require a whole-of-government approach (OECD, 2007d).

Improving the skills of the work force

A vital condition for improving Slovakia's position in global value chains is the existence of a sufficiently large pool of workers with a high level of education and skills. In the short term, inward migration could supply the economy with much needed working hands. For the longer term, a good system of education and training is especially important to strengthen the skills needed for the adoption and development of the technological innovations required in an economy increasingly based on knowledge. Improving the design and quality of education policies is also important, as it ensures broad distribution of the benefits drawn from increased integration in value chains and forestalls the widening inequalities often linked to the globalisation process (Lang and Mendez Tavares, 2018).

With its relatively low wage costs and evenly educated labour force, Slovakia has turned itself into an attractive market for foreign investors. Almost all Slovaks have at least upper secondary education, and few adults have low literacy or numeracy skills. However, the share of high-skilled adults in the total population and the skills and knowledge intensity of Slovak participation in GVCs is low (Figure 18).

Figure 18. The share of high-skilled adults and their contribution to GVCs is low



1. Average of percentage of adults scoring at PIAAC literacy or numeracy proficiency level 4 or 5, or scoring at problem solving in technology-rich environments level 2 or 3.

2. Data for Belgium refer only to Flanders, and data for the United Kingdom refer only to England.

3. OECD calculation of the decomposition of total employment sustained by exports into three groups of skills intensity defined according to major groups of the International Standard Classification of Occupations 2008: High-skilled occupations (ISCO 0 to 8 major groups 1 to 3), medium-skilled (4 to 7) and low-skilled (8 and 9).

4. OECD estimates based on the OECD Inter-Country Input-Output (ICIO) table and the OECD Bilateral Trade Database by Industry and End-Use (BTDiXE).

Source: OECD (2017), *Education at a Glance 2017: OECD Indicators*; OECD (2017), *Skills Outlook 2017: Skills and Global Value Chains*; OECD/WTO (2016), *Statistics on Trade in Value Added (database)*.

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Facilitating immigration of skilled workers

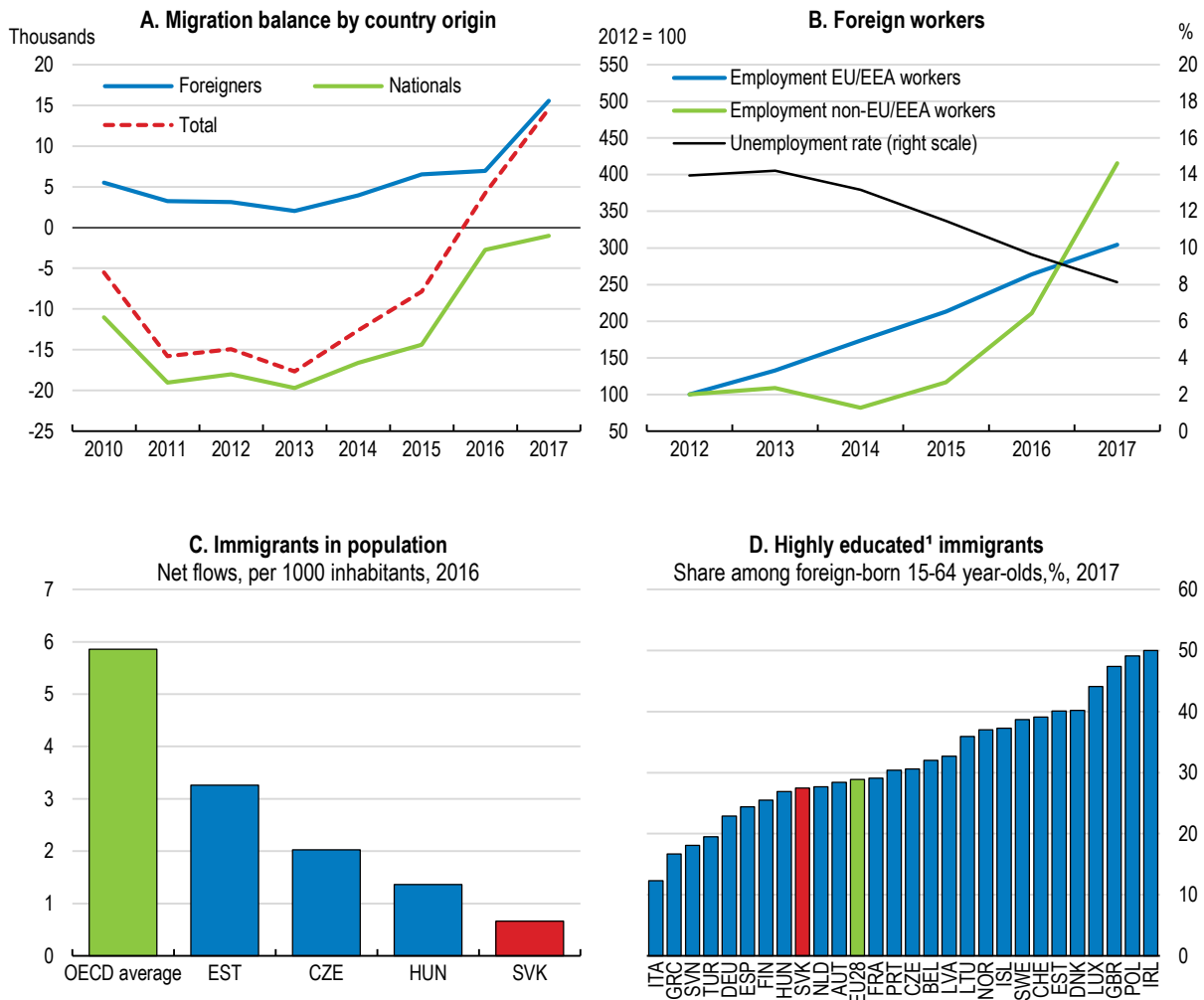
In the last 15 years, the net emigration from Slovakia has been substantial, as 300 000 people (or 6% of the population) left the country. This trend, driven by higher remunerations abroad, was particularly strong between 2004 and 2006, after the country's accession to the EU (Halus et al., 2017). With improved economic conditions, the migration balance reversed in 2016 and 2017 due to the return of a growing number of Slovaks living abroad and stronger foreign immigration (Rizman and Sacherová, 2018) (Figure 19, Panel A). This immigration has especially accelerated for nationals outside the EU and European Economic Area (EEA, particularly from Ukraine, Serbia, Russia and Vietnam), fuelled by shortage of domestic workers in a context of historically low unemployment (Panel B). Nevertheless, the foreign population in Slovakia represents only 1.2% of the total population, against 9.1% in the average OECD countries, and the average net annual inflow of foreigners remains proportionally very low compared to other countries (panel C). As Slovakia also attracts relatively few highly skilled foreign workers (Panel D), the recent improvement in net migration remains insufficient to meet the demand for labour, and this partly reflects stricter immigration rules than in other EU countries (OECD, 2017b), which results in too long procedures (between 6 and 9 months) for hiring non-EU/EEA workers (Pwc, 2017).

To correct this shortcoming, the authorities have made some changes to their recruitment procedures of skilled workers from non-EU/EEA countries. These procedures, which only apply for jobs with remuneration above a certain threshold, require a certification of the qualifications and diplomas that must be translated into Slovak, the granting of a residence permit, and the issuance of a work permit by the employment services, which must ensure that there are no Slovak workers available for the vacant post. To speed up this system, since May 2018 a facilitated procedure - including a labour market test exemption - is in place for occupations in shortage in district where unemployment is below 5% and for firms with less than 30% foreign workers. The shortage list is updated annually by a tripartite commission (MoF, 2018). In June 2018, the government also announced that it will provide special treatment for Volkswagen Slovakia, including simplifications for issuing work permits for foreign workers to help it meet its employment needs (Spectator, 2018).

These measures are going in the right direction, but their limited scope to only one aspect of the hiring procedures and a specific company seems insufficient. At the same time, the exempted occupations are mostly low- and middle-skilled jobs, because the definition of occupations in shortage is based on labour office data, where high skilled vacancies are rarely registered. Therefore, reducing and guaranteeing a maximum time for hiring procedures of non-EU/EEA workers is desirable for all firms without discrimination. For this, the authorities could, for example, apply the "silence-is-consent" principle for issuing residence permits and for certifying workers' qualifications beyond a certain period of time.

The government should develop a comprehensive strategy to keep ties with the large expatriate community. Returning emigrants could bring home skills, networks and financial capital (OECD, 2008). Many OECD countries provide online hubs for their citizens abroad advertising jobs, training, and business and research opportunities in the home country (DFA, 2015). Promoting ties between the diaspora and the country of origin can be an important source of knowledge transfer.

Figure 19. The migration balance has increased but is still low

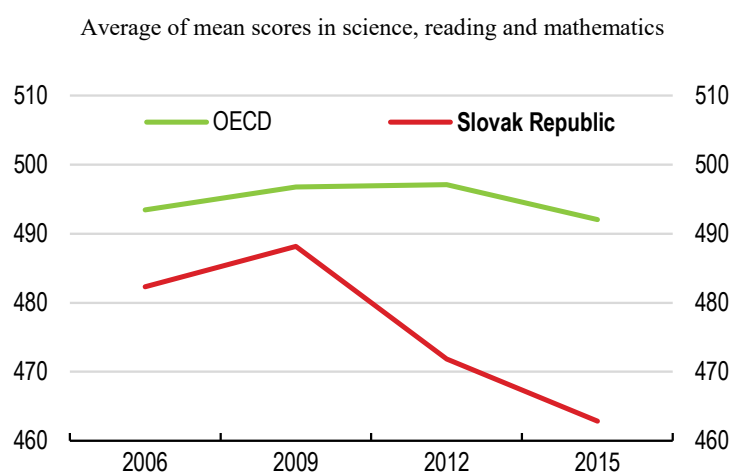


Note: People with tertiary education attainment at levels 5-8 (ISCED 2011).
 Source: OECD Economic Outlook Database; OECD International Migration Database; Eurostat.

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Improving education

High skilled human capital availability is key to ensure sustainable growth. However, the quality of education provided by the Slovak secondary system is below the OECD average. PISA results for 15 year-olds are weak in international comparison and have deteriorated over time (Figure 20). Secondary schools are predominantly vocationally oriented, with 70% of all students at this level enrolled in vocational programmes, one of the highest shares in the OECD. Moreover, vocational students have generally lower levels in literacy and numeracy proficiency than general education graduates, as practical training crowds out more general academic skills (OECD, 2017b).

Figure 20. Students' education outcomes are weak and deteriorating

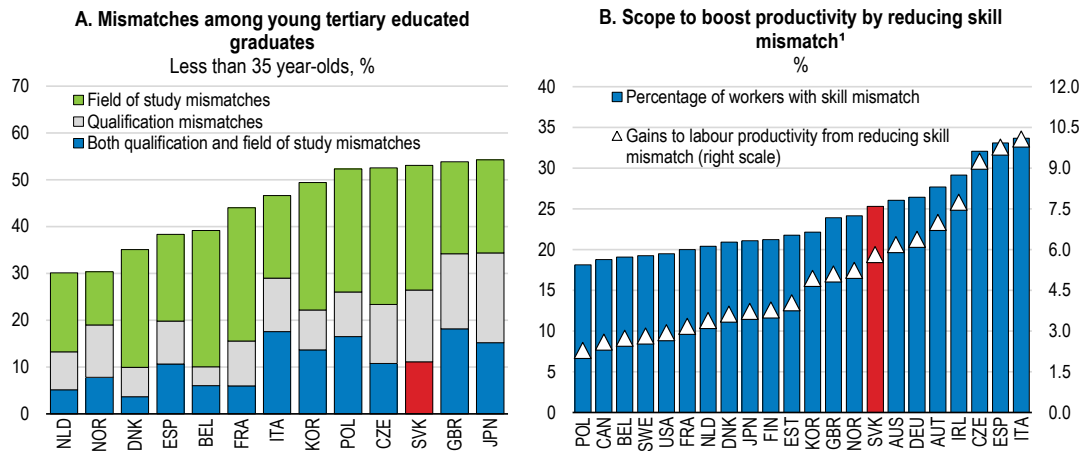
Source: OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education*.

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The higher education system is also beset by serious failings. As stated in the previous Survey, there is a need to improve its average quality (OECD, 2017b). Slovak universities are poorly ranked in international comparison, given their limited available resources, weak research and training outcomes and low capacity to efficiently connect with other stakeholders, both foreign and domestic, including the business sector (U21, 2018). Over 14% of post-graduate students — the second-highest level in the OECD — go abroad for better-quality qualifications, with most (82%) moving to the Czech Republic, where they often remain to find work after they have completed their studies (Minacherová, 2018a; Halus et al., 2017).

Courses at tertiary education level in Slovakia are not adequately balanced, with too great an emphasis on academic learning and very little practical experience. Qualifications and educational mismatches are high and costly (Figure 21, Panel A). Over half of all young people are affected by this problem, which is most pronounced for the relatively large numbers studying human and social sciences, while the proportion of students graduating in science, technology, engineering and mathematics (1.66% for those aged 20 to 29 in 2015) is lower than the EU average (1.91%) (EC, 2018a, TBP2). Qualifications are poorly matched to the needs of businesses involved in robotisation and the growing use of IT solutions, and graduates are insufficiently prepared to solve problems that are non-routine or require the use of a computer. Yet, entry into the era of Industry 4.0 (smart factories, Internet of Things, connected cars) seems to be inevitable within a five-year timeframe for two-thirds of businesses in the automotive sector (PwC, 2017). This major imbalance between the supply of and demand for skills on the labour market comes with a cost: it reduces the productivity and salaries of Slovak workers by an estimated 6%, a high level by international standards (Panel B).

Figure 21. Qualifications and educational mismatches in Slovakia are large and costly



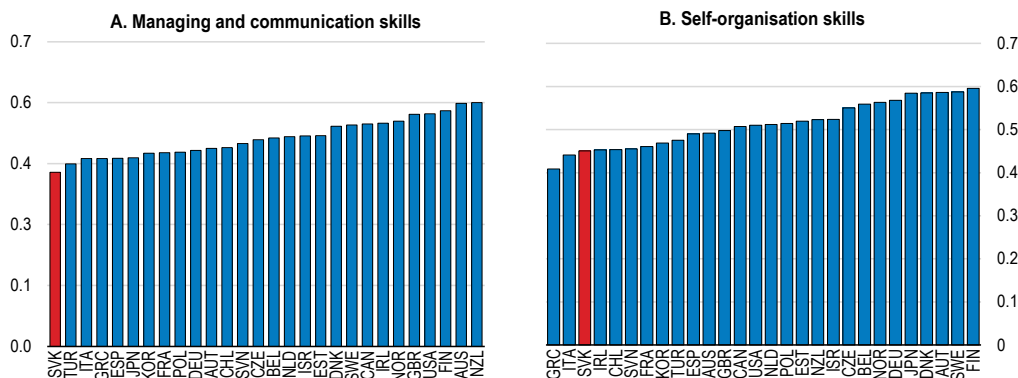
Note: The figure shows the percentage of workers who are either over- or under- skilled and the simulated gains to allocative efficiency from reducing skill mismatch in each country to the best practice level of mismatch. The figures are based on OECD calculations using OECD (2012), *Survey of Adult Skills*.
Source: OECD (2012), *The Survey of Adult Skills (PIAAC)*; M. Adalet McGowan and D. Andrews (2015), “Labour market mismatch and labour productivity: Evidence from PIAAC data”, *OECD Economics Department Working Paper*, No. 1209, OECD Publishing, Paris.

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The Slovak education system also seems to be insufficiently focused on the acquisition of soft skills, such as the ability to work with others, share information, organise one's work, and communicate with, influence and manage others (Figure 22). Given the digital transformation and the growing use of robots, the value of these social skills, which are required for tasks that cannot be automated or are complementary to cognitive skills, is rising (OECD, 2016a; Grundke et al., 2018). These gaps in Slovakia's education system may well be one of the factors holding back the performance and capacity of Slovak SMEs to fully harness the expertise of the foreign enterprises operating in the country. Differences in management practices can account for up to 30% of total factor productivity differences between countries (Bloom et al., 2017).

Figure 22. Slovak workers' soft skills seem under developed in a number of domains

Workers' task-based skills, index, 2012 or 2015



Note: A higher score is associated with a higher frequency of performing these tasks on the job. Data for Belgium refer only to Flanders and data for the United Kingdom refer to England and Northern Ireland jointly.

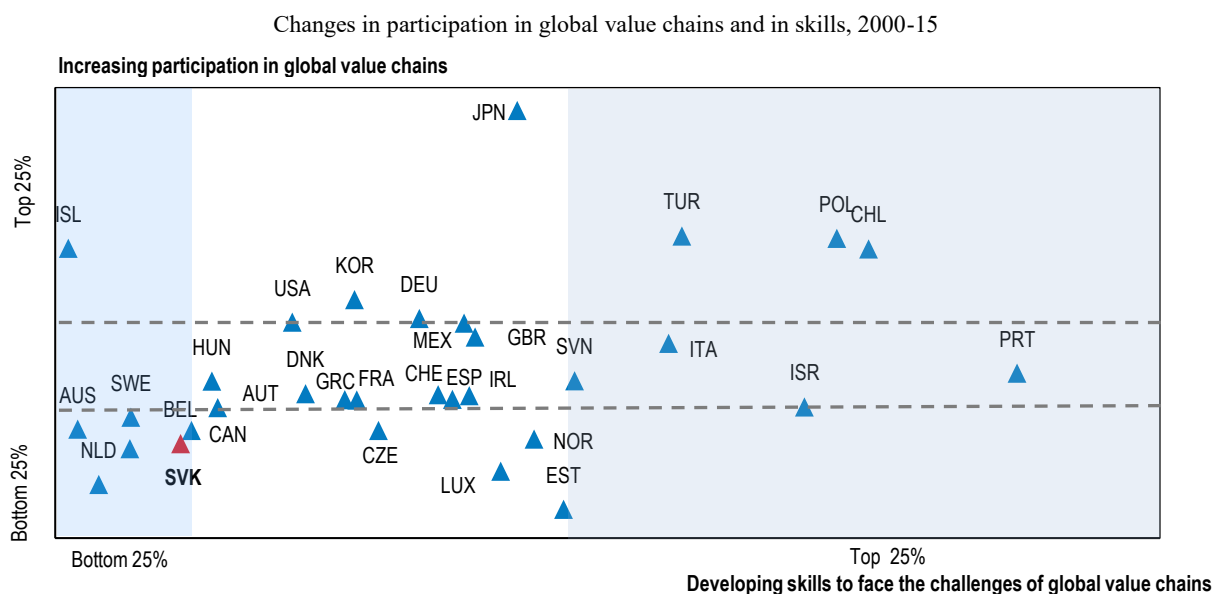
Source: OECD (2017), *Skills Outlook 2017: Skills and Global Value Chains*, OECD Publishing, Paris.

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While the higher education system is struggling with serious quality issues, it also trains relatively few students. Although the proportion of students graduating from higher education has doubled since 2000 to some 30% of the 20-34 age bracket, it remains below the OECD average (42%) and still falls some way short of the target of 40% by 2020 set by the authorities. With a significant share of students going abroad for better-quality higher education, the entry rate in Slovak tertiary education system is lower than the OECD average (OECD, 2017e). The country suffers from a particular shortage of ICT specialists, who represent only 2.9% of total employment, as compared to the EU average of 3.7% (EC, 2018a). Most research has found that the need for skilled labour is likely to continue to increase in most countries, in step with technological advances and the increased automation of routine jobs (OECD, 2018b; Keister and Lewandowski, 2016; Miklosovic and Radvanski, 2016). These needs could be significant in Slovakia, where 62% of jobs are likely to be replaced by robots or to undergo major change — a higher figure than in other countries (see Figure 15 above).

These difficulties reflect the slow pace of the education sector's response to changing needs in the labour market. By international standards the jump in younger workers' ICT skills compared to those of older generations has been modest (see Figure 14, Panel B, above). And this limited improvement in the average skills of the population seems to have contributed to the slow progress of Slovakia's integration into GVCs since 2000 (Figure 23).

Figure 23. Increases in skills and participation in global value chains has slowed since 2000



Note: The figure shows the scoreboard indicators capturing the development of participation in GVCs over 2000-11 and the evolution of skills. Countries in the upper part of the figure are among the top 25% that have increased their participation in GVCs the most while those in the lower part of the figure are among the bottom 25% that have increased their participation in GVCs the least. Countries in the right-hand side are among the top 25% that have increased their skills the most while those in the left-hand side are among the bottom 25% that have increased their skills the least. Countries in the middle are around the average.

Source: OECD (2017), *Skills Outlook 2017: Skills and Global Value Chains*, OECD Publishing, Paris.

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Slovakia's ongoing education reforms need to be fast-tracked to strengthen the links between the education system and the labour market. As technology is evolving quickly,

the need to promote workers' adaptability to rapidly changing labour market demand is becoming increasingly important, making it necessary to improve the level of general skills at secondary level. According to Hanushek et al. (2015), labour outcomes of VET graduates are lower than those following the academic track over the long run as skills acquired through VET may become obsolete more rapidly. Since the dominant role of VET at the secondary level in Slovakia is not expected to diminish much in the near future, vocational schools should offer a more balanced mix of general and practical skills, with sufficient time devoted to general skills acquisition. In any case, with more and more VET graduates entering tertiary education the need for general skills is increasing.

Making higher education more responsive to labour market needs is also required. To this end, setting up a graduate tracking system, as Poland did it few years ago (OECD, 2018c), would be useful, as stressed by the 2017 Survey. Improving educational counselling and career guidance to students would also be advisable. Recent steps in this direction, including the creation of centralised information outlets for students and their parents are welcome but should not be restricted to the dual work-study programmes (Minarechová, 2018b).

Tertiary education programmes should also be developed that have a greater professional focus: there is almost no vocational programme at the Bachelors level in Slovakia, and financial incentives push universities to produce too many students with little practical experience at Masters level (OECD, 2017b). Businesses also need, in general, to be more closely involved in the governance of higher education. Good co-operation between the business sector and universities has a number of positive effects: in some universities these initiatives have encouraged the development of business services centres, for example (Chovanec, 2018), and Slovakia is now well placed to develop new comparative advantages in these service sectors (OECD, 2017f). At end-2017 business service centres were the third largest employers in Slovakia after the automotive and electronic industries, with almost 36 000 workers. More than 70% of these employees were university educated and received an average salary about twice as high as the national average. Employment in this sector has also expanded relatively rapidly at an annual rate of about 10% over the last two years (Liptáková, 2018; AmCham, 2017).

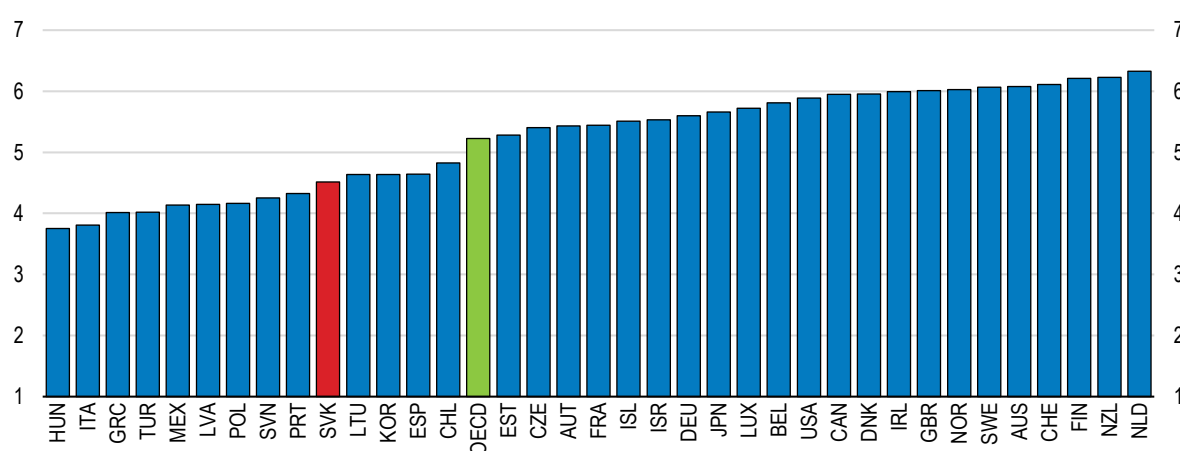
Authorities also need to make sure that students are better prepared for digital technologies. Work on this has already begun, with the Academy of Information Technologies' February 2017 launch of the programme Learning for the 21st Century. In September 2017 the government also introduced its Digital Coalition initiative, within the framework of the EU plan to improve the digital skills of students, workers, employers and job-seekers. All young people need a good command of basic ICT skills, given their increasing use in most professions and businesses. Moreover, training for ICT specialists should be more heavily promoted, given the pace of change in this sector, especially the sharp rise in needs for advanced engineering and machine-learning experience.

It would also be advisable to improve the acquisition of soft skills, especially in relation to management. It is not enough for workers to have the required skills in, for example, the digital sector — they need to be able to leverage them fully for the best results in terms of productivity and competitiveness. Good managers increase the effectiveness of committed resources by improving the organisation of work within the firm, selecting good candidates, optimising the use of each individual's skills, and training underqualified workers. However, professional management is underused in Slovak firms (Figure 24), probably because the large majority of them are small and managed by their

owners. There could also be a failure of low-skilled company owners, especially those of older generations influenced by the communist era, to appreciate the potential value that a university-trained marketing manager could bring. Providing opportunities for management training for those with managerial responsibilities without prior training in management is one way forward. Developing management skills, especially SMEs, could also be encouraged as in a number of OECD countries (OECD, 2017g). Moreover, complementary to a managerial skills development programme, Slovakia could emulate more specific policies such as developing business coaching programmes for SMEs (as in New Zealand) or supporting the establishment of management and entrepreneurs' networks to disseminate the adoption of good practices (as in the Netherlands and Finland) (OECD, 2016b).

Figure 24. Professional management is scarcely used

Reliance on professional management, score from 1 (lowest) to 7 (highest), 2017-18

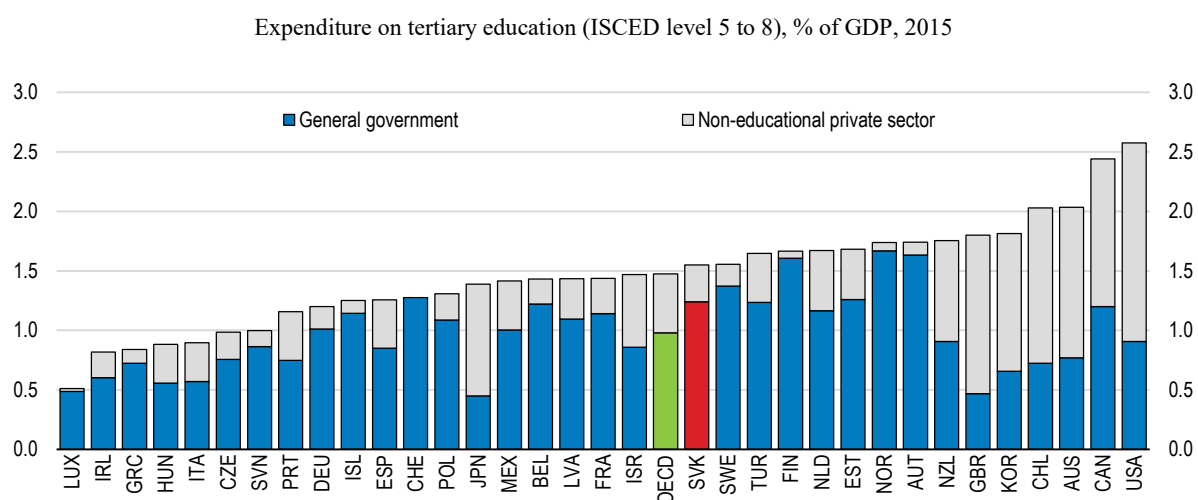


Note: Score based on responses to the question: “In your country, who holds senior management positions in companies? [1 = usually relatives or friends without regard to merit; 7 = mostly professional managers chosen for merit and qualifications]”.

Source: World Economic Forum (2017), *The Global Competitiveness Index Historical Dataset 2007-2017*.

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Seeing these changes through, however, will require additional resources. The funding allocated to tertiary education in Slovakia is relatively low, coming to just 1.1% of GDP in 2014 compared to 1.6% in OECD countries on average (Figure 25). As a result of this low level of funding, which mostly consists of public money, teaching staff are paid comparatively little, and this has a knock-on effect on the development and quality of higher education. In ICTs in particular teaching roles vie with highly prized and better paid positions in industry for highly skilled IT staff (Minarechová, 2018a).

Figure 25. Spending on higher education is low

Source: OECD Educational finance indicators.

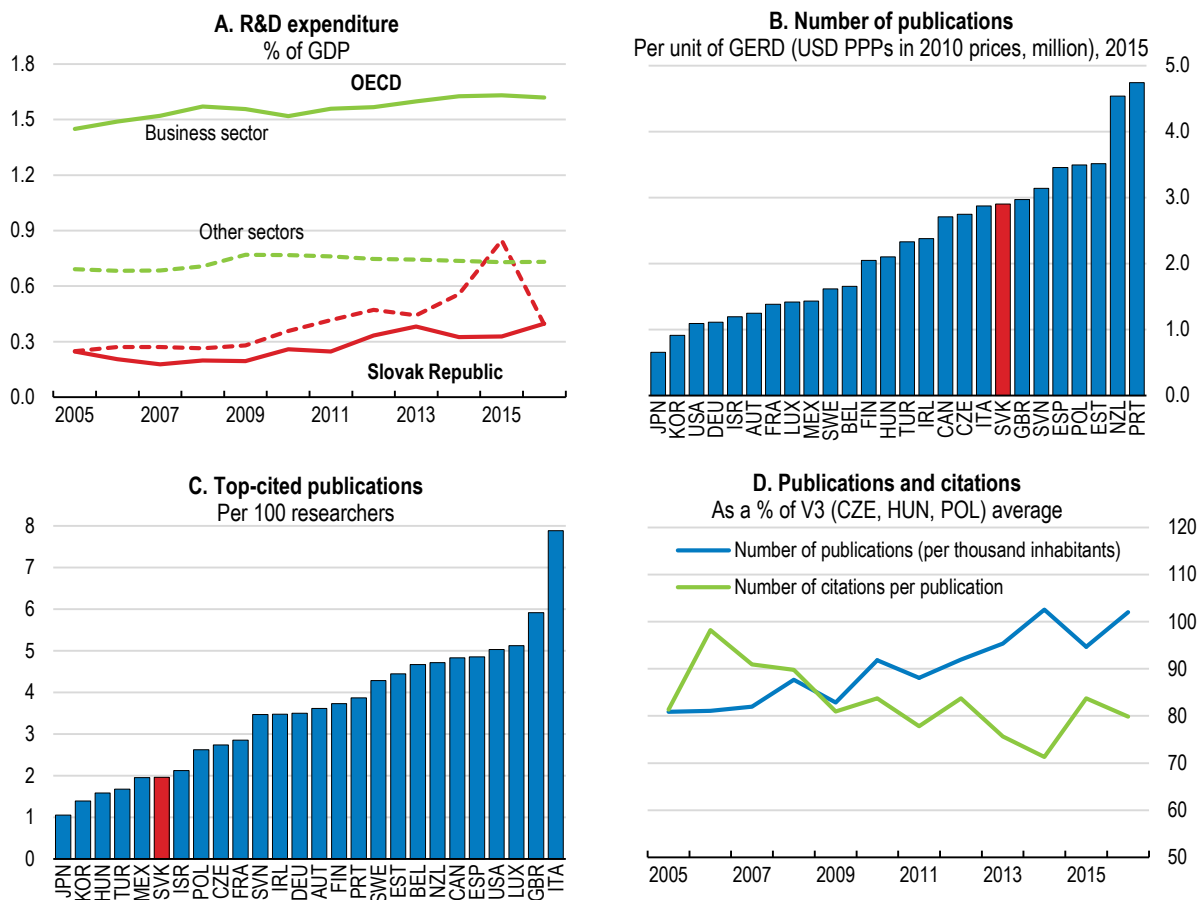
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Other OECD countries make use of financial instruments to influence the behaviour of higher education institutions. Governments, for example, use performance-based funding to reward institutions based on different indicators. For example, in Korea and Estonia the funding system shift more resources towards the tertiary institutions, whose graduates have better labour market outcomes (OECD, 2017h). More and more countries also use competitive grants allocation. Tertiary education institutions compete on the basis of peer-reviewed project proposals against a set of objectives of grant. It seems essential to increase Slovakia's investment in higher education in order to prepare for the future. To a large extent the government can expect to recoup the cost of these investments through tax revenues on the relatively high salaries of the best qualified workers (OECD, 2017i).

Promoting research and innovation

Stimulating innovation and research would help facilitate the transition towards a more diversified, knowledge-based economy, which would enable Slovakia to better reap the benefits of its participation in GVCs. The skills and knowledge intensity of Slovakia's involvement in global value chains is low (see Figure 28 above). In addition, the automotive sector is dominated by a small number of multinationals, which operate globally from the core through the direct ownership of all assemblers and most component suppliers (Pavlinek, 2012). In this case, it can be even more difficult to relocate the R&D from the core to its global low-cost brand in the Slovak Republic. The resources allocated to innovation by the country are also modest. Although expenditure on research and development (R&D) has increased over the past decade or so, it remained below 1% of GDP in 2016 compared to an OECD average 2% of GDP (Figure 26, Panel A). This expenditure is particularly low in the business sector, which employs a limited number of researchers by international standards, and files very few patent applications (Panels B, C and D), thereby reducing the country's capacity to develop higher value-added activities within value chains.

Figure 27. The efficiency and quality of public research need to be improved



Source: OECD Main Science and Technology Indicators Database; OECD (2015), OECD Science, Technology and Industry Scoreboard 2015: Innovation for growth and society, OECD Publishing, Paris; Scimago Journal Rank.

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The effectiveness of public research is, moreover, undermined by its fragmented framework. R&D policy is encumbered by a lack of co-ordination between multiple stakeholders with responsibility in this domain, including several ministries and eight different government agencies (EC, 2016). These bodies tend to compete rather than cooperate over access to EU structural funds, for example, despite the fact that the purpose of these resources is to promote a horizontal research agenda for cross-cutting issues. The recent creation of a co-ordination committee, reporting to the Deputy Prime-Minister, to implement the European Regional Innovation Strategy (RIS3) is designed to solve these problems. Nevertheless, there is a need to support this welcome development by introducing the systematic monitoring and evaluation of the effectiveness of the use of these funds, which is currently lacking. In addition, a pooling of academic research initiatives could be advisable, as they are currently spread across the HEIs and the Slovak Academy of Science, which dilutes the resources available and the capacities of each institution in a small economy like Slovakia (EC, 2018b). To this end, the authorities should consider reducing the number of universities and create larger, internationally visible research units. As was mentioned before, the government launched recently

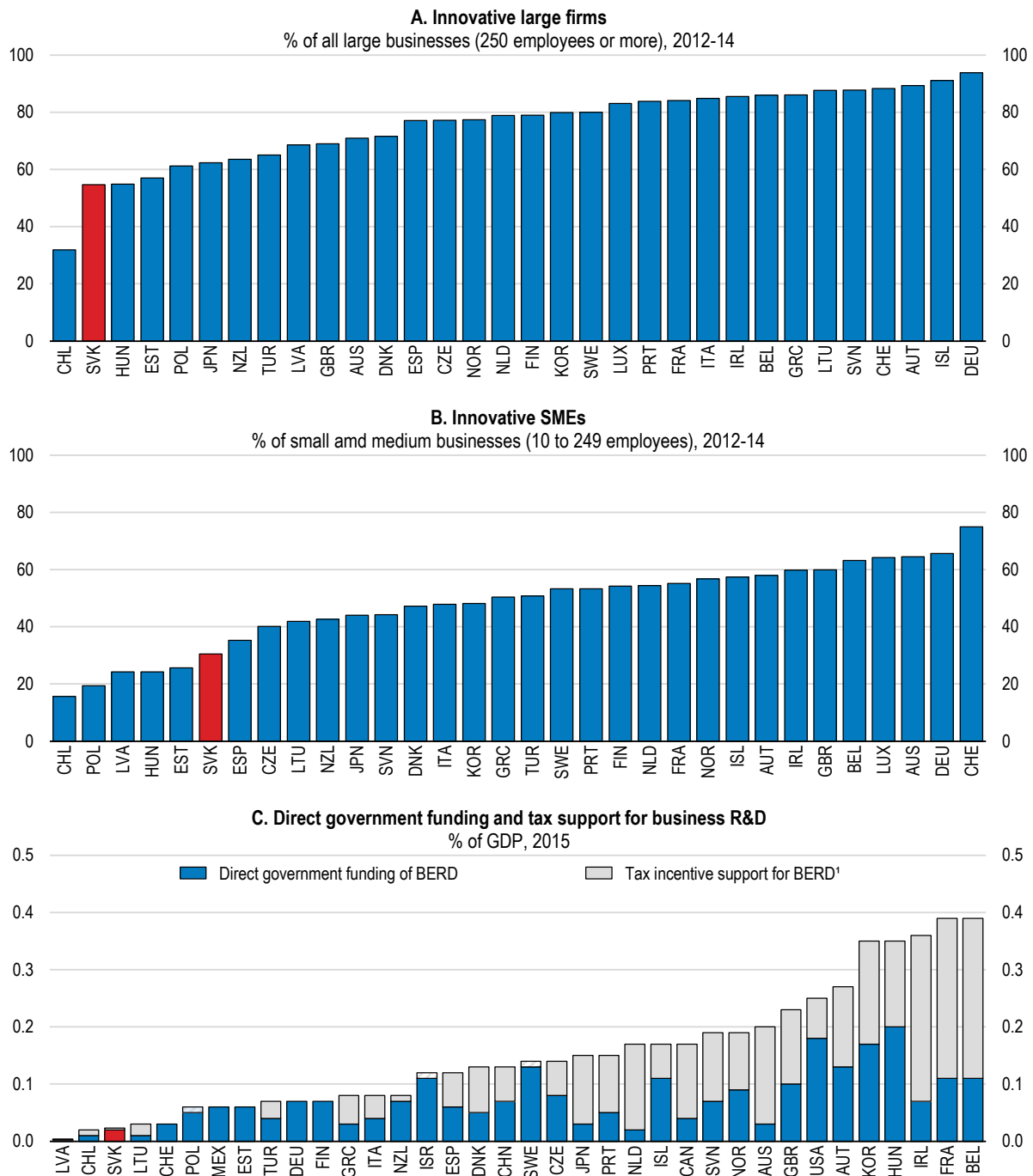
reform, which should address these shortcomings with implementation phase starting in 2021.

It is also important to stimulate private-sector research and innovation, which have been rising only slowly over the last decade (see Figure 27, Panel A). Yet, given Slovakia's economic catch-up and the gradual increase in its labour costs, there is a growing need for firms to innovate to maintain and strengthen their competitiveness. The low level of business R&D spending reflects, on the one hand, the limited interest shown so far by multinationals located in Slovakia to develop research activities in the country and, on the other, the low investment by local firms, especially SMEs, in this domain (Figure 28, Panels A and B).

To stimulate research and innovation initiatives, tax incentives, which were previously very limited (Figure 28, Panel C), have been increased, by bringing the tax-deductible proportion of R&D expenditure for companies from 25% to 100% in 2017. In 2015 only 4% of SMEs used public support focused on innovation (Slovak Business Agency, 2016), despite the effect of the tax change. Tax incentives may help boost private investment in knowledge, since returns on R&D investments are difficult to appropriate by firms, as some of the resulting outcomes will leak out or "spill over" to other firms. In addition, SMEs and start-ups generally struggle to find the external financing required for innovation projects, whose outcomes are often uncertain. The effectiveness of these tax incentives will, however, depend on their design and the quality of their implementation. International experience shows that to be effective such policies must include rigorous *ex ante* and *ex post* evaluation systems (Appelt et al., 2016). This is all the more necessary in Slovakia as the risk of misuse of this public aid cannot be underestimated given the tax evasion problems that the country faces (OECD, 2017b).

To support innovation the authorities could also give greater priority to direct support schemes, such as grants, which are easier to monitor than tax deductions, which require checking more companies. A well-designed and properly focused strategy based on closer co-operation between private and public research could help strengthen the country's research capacities in areas such as the automotive sector. There are many needs in the latter area, such as the reduction of CO₂ emissions, the development of lightweight materials, improvements to car connection systems and safety and driver assistance systems (PwC, 2017). Creating centres of excellence for some of these domains could also increase the country's appeal for the research teams of large multinationals. Austria has, for instance, developed significant R&D activity related to the automotive sector, and it is pursuing interesting policy initiatives thanks to the COMET (Competence Centres for Excellent Technology) programme and the Christian Doppler Laboratories (Comet, 2018; Cdg, 2018), which have been successful in promoting research cooperation between companies and application-oriented research over the past two decades (Harms, 2018).

Figure 28. Boosting innovation in the private sector is necessary



Note: Data on tax incentive support are not available for Israel, Poland and Sweden.
Source: OECD (2017), *OECD Science, Technology and Industry Scoreboard 2017: The digital transformation*, OECD Publishing, Paris.

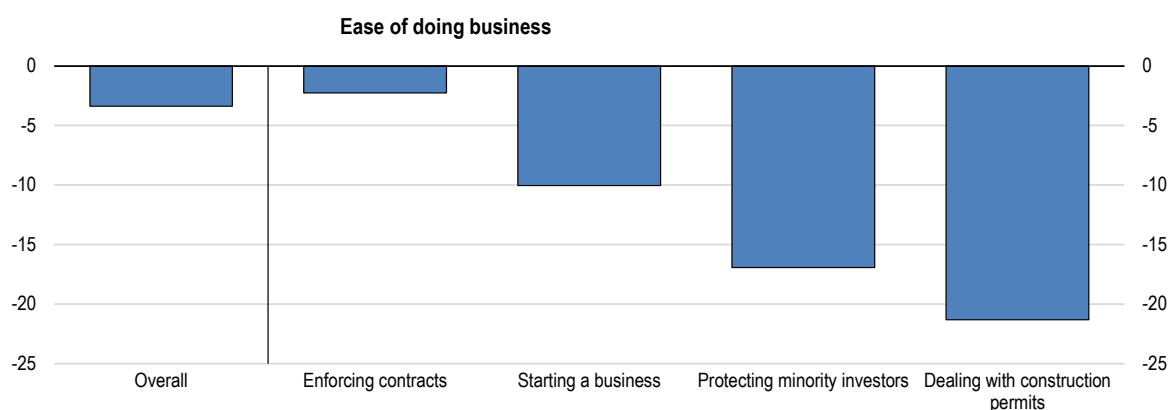
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Enhancing the business environment and the quality of regulation

A prerequisite for strengthening private-sector innovation is to put in place framework conditions for labour and product markets that are conducive to corporate research and experimentation. Regulations in these markets should not impose excessive costs on firms in the event of unsuccessful innovations, e.g. through inefficient insolvency policy, nor reduce their return on successful investment by hindering the possibility of efficient reallocation of the workforce and of capital. However, a favourable business environment is important not just for promoting the dissemination of knowledge and innovation, but also for boosting entrepreneurship and giving firms the impetus required to invest and create high-quality products at a lower cost and to promote a better integration into GVCs. Despite the progress made in product market regulation since 2008, several aspects of the business environment harm business performance in Slovakia, especially for SMEs, which employ 70% of the country's workforce.

In Slovakia the main shortcomings in the product market are due to ineffective administration and extensive red tape. According to the World Economic Forum dysfunctions in administrative management, along with corruption, are a serious obstacle for firms (WEF, 2017). Such dysfunctions can be seen, for example, in the inefficiency of the procedures for starting up a business, guaranteeing the protection of minority investors or granting building permits (Figure 29). On average, it takes, for instance, 300 days to obtain a building permit for a warehouse compared to an OECD average of 153 days (World Bank, 2019). According to the indicators in Doing Business 2019, there are also shortcomings in contract enforcement, which is essential for the proper functioning of businesses.

Figure 29. Inefficiency in the government sector and bureaucracy undermine business environment



Note: The distance to frontier (DTF) measure shows the distance of each economy to the “frontier,” which represents the best performance observed on each of the indicators across all economies in the Doing Business sample since 2005. OECD high income includes 36 OECD countries excluding Mexico and Turkey.
Source: World Bank, Doing Business 2019.

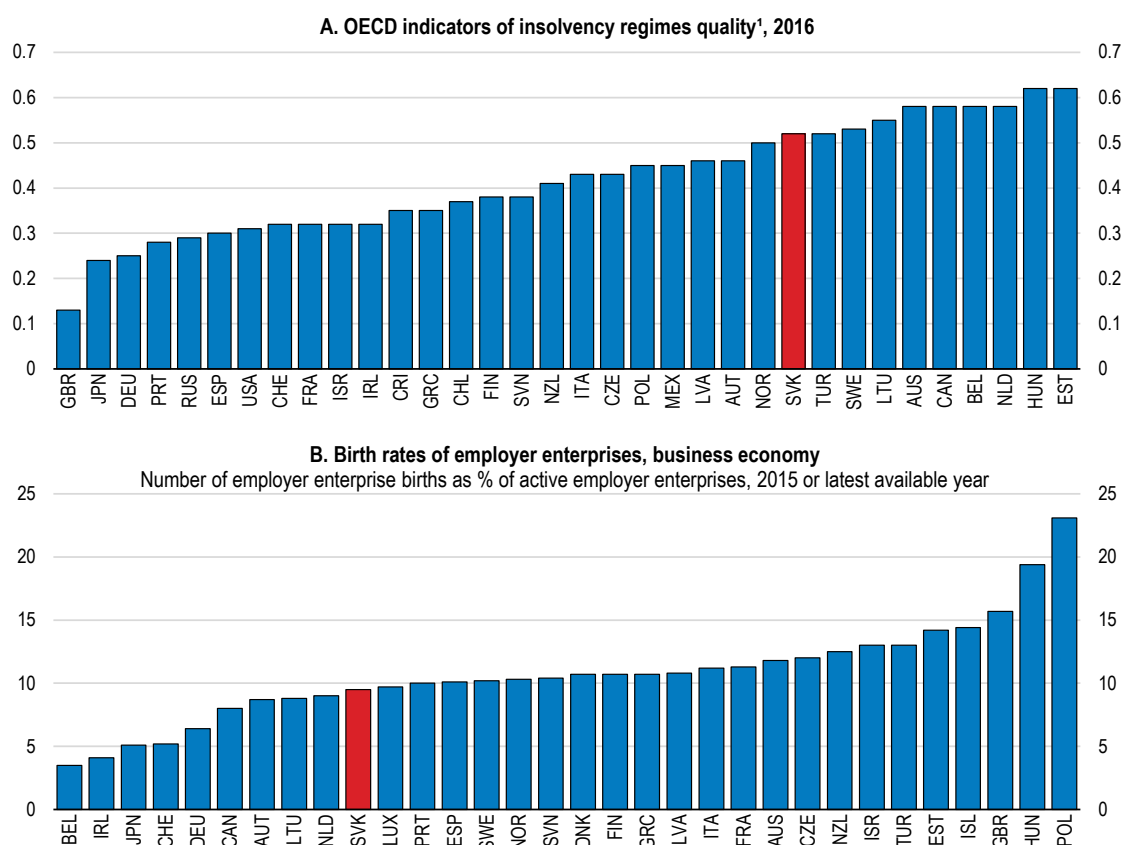
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Given the inefficiency of public management, the multiple administrative charges create a heavy burden, in particular for SMEs, as acknowledged by the authorities (Slovak Business Agency, 2017). According to the Slovak National Union of Employers, red tape increased by over 13% between 2007 and 2016 due to new obligations stemming from changes in corporate legislation (EC, 2018b). In addition, frequent amendments to this legislation create an unstable environment that is detrimental to conducting business.

Between 2007 and 2016, for example, the trade law was amended six to seven times a year on average, and the labour code two to three times.


Shortcomings in insolvency procedures are another obstacle to the smooth functioning of product markets (Figure 30, Panel A). For a start, they are very slow, with an average disposition time of four years against an OECD average of less than two years. They are also costly, at around 18% of debtor assets compared to 9% on average in advanced countries (World Bank, 2019). These procedures lack preventive measures and early warning systems for struggling enterprises (Adalet McGowan et al., 2017). This bankruptcy system, whose use often imposes a stigma on entrepreneurs who are for the most part honest, is hardly conducive to experimentation and the emergence of start-ups, which are created at a slow pace by international standards (Panel B). An effective insolvency regime is nevertheless a necessary component of the process of creative destruction, which is inherent to the functioning of market economies and to the improvement of the allocation of resources in the economy (Adalet McGowan et al., 2017).

Figure 30. Gaps in the insolvency regime weakens entrepreneurship



Note: A higher value corresponds to an insolvency regime that is most likely to delay the initiation of and increase the length of insolvency proceedings. Composite indicator based on 13 components including: time to discharge; early warning mechanisms; special insolvency procedures for SMEs; creditor ability to initiate restructuring; availability and length of a stay on assets; degree of involvement of courts; distinction between honest and fraudulent entrepreneurs and the rights of employees. For more details, see Source.

Source: M. Adalet McGowan, D. Andrews and V. Millot (2017), “Insolvency Regimes, Zombie Firms and Capital Reallocation”, *OECD Economics Department Working Papers*, No. 1399; M. Adalet McGowan and D. Andrews (2018), “The Design of Insolvency Regimes”, *OECD Economics Department Working Papers*, forthcoming; *OECD Structural and Demographic Business Statistics (SDBS) Database*.

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The authorities are aware of these issues and have launched several reforms to address them. To cut red tape the government launched the “Once is Enough” initiative, which uses links between the administration’s different databases to ensure that, as of July 2018, individuals and enterprises are no longer required to submit printouts of any documents already in the State’s possession. The government has also launched a plan to reduce administrative charges over a period of four years. The first package of reforms presented in June 2017 comprised 35 measures, the nine most important of which entered into force at the end of 2017 in the form of provisions that streamlined and accelerated the granting of building permits (EC, 2018b). These reforms, which the authorities believe could save firms the equivalent of 44 million euros per year, were followed by the announcement of a second package of 25 measures in May 2018, mainly designed to facilitate certain aspects of managing SMEs and family-owned businesses, and two further packages are scheduled between now and 2020.

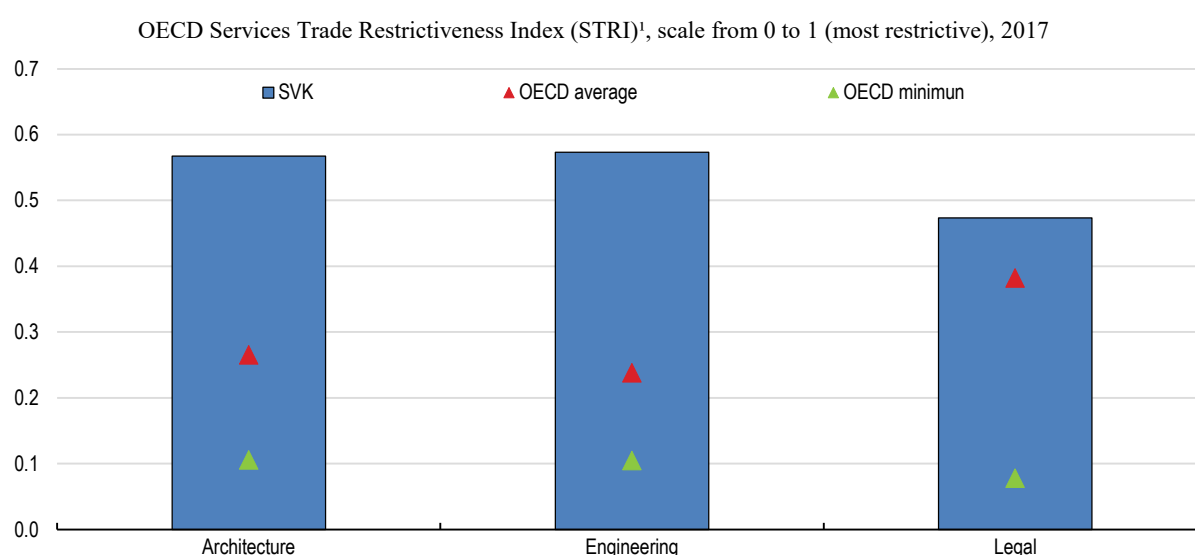
A strategic better-regulation document “RIA 2020” was also adopted by the government at the start of 2018 with the purpose of introducing both a pilot *ex post* assessment of regulations and a “one-in, one-out” principle whereby any new regulation affecting businesses must result in another regulation being phased out (MoF, 2018). The framework of the insolvency regime has also been improved with the online publication of a register of businesses and entrepreneurs declared insolvent, and the creation of a new legal concept of “company in crisis”, which ensures that the claims of common creditors’ on struggling businesses have priority over shareholder claims.

While this reform process, which covers many areas, is welcome, it is nevertheless important to pursue and expand it. For example, in order to further reduce the burden on businesses, the authorities should follow Portugal’s example and adopt a “silence is consent” rule for administrative procedures as and when appropriate. The authorities should also follow the example of Denmark, Estonia and Norway, and step up the pace of the digital transformation of systems for granting permits and authorisations. Improving the management of legal procedures, especially for bankruptcies, would have positive repercussions on the business environment and the vitality of entrepreneurship. Information campaigns aimed at removing the prejudices and stigma associated with the bankruptcy of honest entrepreneurs would also be advisable, showing that entrepreneurial failure is part of the normal functioning of market economies and reflects a natural learning process for entrepreneurs in the realisation of their projects.

In terms of FDI policy, international evidence suggests that policies to attract foreign investments in high-tech industries are more effective when based on a comprehensive industrial policy, which includes a wide range of tools. These include human capital, infrastructure and public governance, which are key to attracting FDI (OECD, 2011) and are more broadly covered in this chapter. Nevertheless, investment aids provide a further boost to high-value added FDI. In April 2018, a new system of investment aid entered into force designed to encourage the development of higher value added activities. This will benefit new projects, such as research centres, and criteria for eligibility will no longer focus on the number of new jobs created but on the average salary of new jobs. This aid, which varies between 25% and 35% of investments in accordance with EU regulations, concerns around 20 projects a year, 80% of which are submitted by foreign enterprises. The government should abolish restrictions on foreign businesses entering the services sector in order to promote diversification into services, including through FDI (Figure 31). Such restrictions, especially on providers of legal services, architects and engineers, are high.

These regulatory barriers substantially limit foreign competition in several services sectors, especially professional services such as civil engineering, legal services and architecture. For example, in architecture and engineering services, Slovakia imposes residency and nationality requirements as preconditions for obtaining a license to practice (OECD, 2017j). Also, shares in businesses in these sectors must be majority owned by licensed professionals, who must also constitute a majority on their boards. Similarly, an authorisation from the Slovak authorities is needed to practice national and international law, and all the shares in law firms must be owned by locally licensed lawyers, and their boards must comprise locally licensed lawyers. There are also restrictions for accountants, tourist guides and real estate agents (EC, 2018b). All of these barriers tend not just to penalise the efficiency of these sectors, but also to make Slovak enterprises less suited to meeting the needs of foreign clients, thus reducing their capacity to integrate into value chains (Miroudot and Cadestin, 2017a).

Figure 31. Entrepreneurship barriers affect the professional services



Note: The indices are calculated on the basis of the STRI regulatory database which contains information on regulation. The STRI database records measures on a Most Favoured Nation basis. Preferential trade agreements are not taken into account.

Source: OECD (2018) Services Trade Restrictiveness Index.

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Improving transport infrastructure

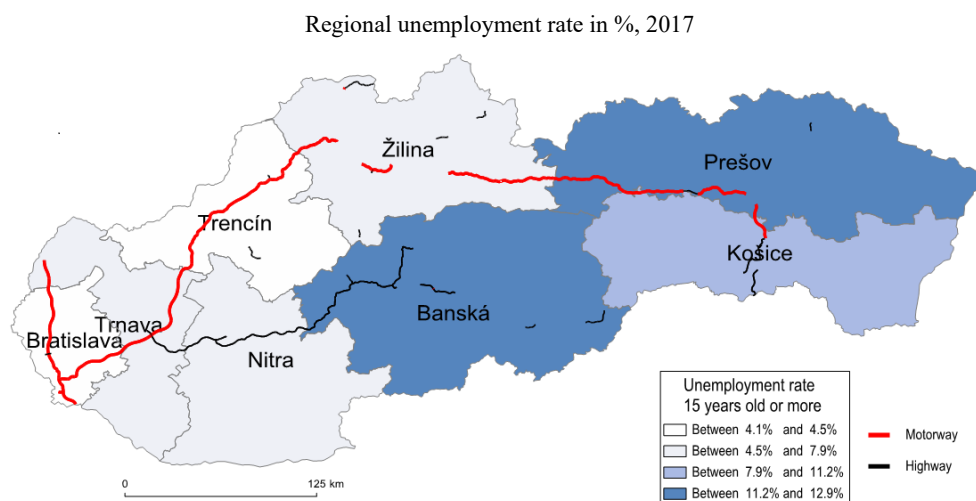
Transport infrastructure investment can boost total factor and labour productivity *inter alia* by decreasing trade costs and increasing international trade (Donaldson, 2018). This is of particular importance for Slovakia, whose development is based to a large degree on a strategy of closer integration into international trade. A reliable, low-cost transport network offering fluid connections to other countries is vital to the competitiveness of businesses whose intense trading with other players in production chains must be highly co-ordinated and adhere to precise schedules. Efficient and close connections between regions are also needed to promote balanced growth and allow the whole country to attract investment. By facilitating participation in the labour market, fast and reliable transport links make it possible for the country to mobilise all its labour resources and

increase the productivity, pay and well-being of the population. To promote sustainable development, Slovakia also needs high-quality public and urban transport in order to avoid congestion and to protect the environment by limiting pollution and greenhouse gas emissions.

Failings of the transport system

Although Slovakia's transport network has helped contribute to its tight integration into international trade, its failings prevent the country from reaping the full benefits of its privileged position in the centre of Europe and the opportunities generated by its participation in GVCs. Transport infrastructure is also very unevenly distributed across the territory, contributing to the significant regional disparities between Bratislava and the north, on the one hand, and the central and eastern parts of the country on the other (Figure 32). These disparities have been increased by the country's investment focus since the early 1990s on expanding the motorway network and upgrading the rail network around the capital and northwest of the country (Michniak, 2015). The Slovak expressway and motorway network is also underdeveloped compared to the EU average: links between the country's main cities have not all been completed, leading to longer journey times, although current projects slated for completion in 2020 should partly correct this. Recent research into transport modernisation in some regions has highlighted the concomitant benefits in terms of lower unemployment thanks to the development of business activity in the tourist sector, for example (Habrman and Žúdel, 2017; Mikloš and Habrman, 2018).

Figure 32. Unequal distribution of transport infrastructure contributes to regional inequalities

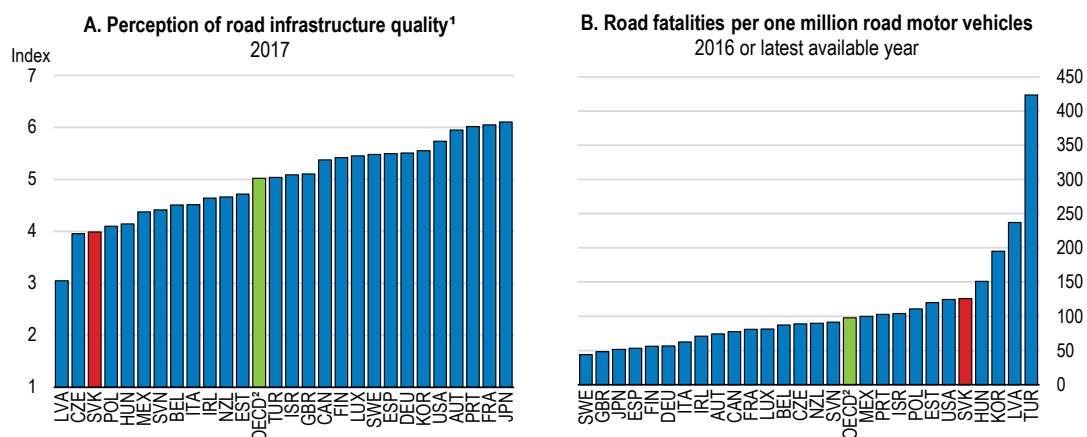


Source: OECD (2018), *OECD Regions at a Glance 2018* (forthcoming).

Slovak motorways are of good quality, having benefited from investment in recent decades, but the rest of the road network is beset by serious deficiencies. The condition of the first-class road network, which is denser than in the EU on average, has deteriorated dramatically since the beginning of the 2000s owing to insufficient maintenance and repair. In 2016, 38% of these roads were in bad or critical condition, and the perceived quality of Slovak road infrastructure ranked among the lowest in the OECD (Figure 33, Panel A). The situation is, in fact, likely to deteriorate further, given the under-resourcing of the public company that manages the network, the Slovak Road Administration

Authority (SSC). Its annual maintenance budget of around EUR 50 million between 2017 and 2019 is far below the estimated amount that would be required (EUR 64 million) to properly fulfil its mission (MoF, 2018). Road fatalities have been falling in Slovakia since 2000, but remain high by international standards (Panel B), and are higher on secondary roads than expressways.

Figure 33. Road infrastructure quality and security need to be improved



1. Index from 1 (lowest score) to 7 (highest score).

2. Unweighted average of available countries.

Source: ITF-OECD Transport Statistics Database; World Economic Forum (2018), *The Global Competitiveness Index Historical, 2007-2017*.

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Rail transport is also of inadequate quality. One of the difficulties of the network, just 43% of which has been electrified, is that like all public transport it is increasingly underused. Only a quarter of all journeys were taken using public transport in 2014, compared to almost half 20 years earlier (MoTRCD, 2016). The sharp rise in the number and use of private cars fuelled by rising living standards, which has caused the decline in rail travel, has also undermined the resources of public rail companies and led to a decrease in repair and maintenance work. As a result, there are speed restrictions on many parts of the network, which lengthen transit times both for passengers and freight, and further diminish the attractiveness of this mode of transport. Falling passenger numbers on public transport, moreover, have pushed up the cost of the subsidy, paid for with public money, because central and local government are required to provide a minimum service.

The management of transport infrastructure need to become more efficient

The authorities are anxious to solve these problems in a country where investment in transport is greater than average in OECD countries, as in other catch-up countries (Figure 33), and they have assessed the effectiveness of spending in this sector as part of their “Value for Money” initiative (MoF, 2016). Several shortcomings were detected, both in the management of investments and in that of operating costs, which led to some modifications and reform proposals. Improvements are indeed needed regarding the allocation of resources between investment and maintenance spending as well as project-selection procedures. A comparison of infrastructure governance systems in different countries, based on a detailed survey (Hertie Governance School, 2016), does confirm that Slovak infrastructure project management is relatively inefficient.

Improving project selection procedures

There is a particular need for increased transparency and rigour of project selection procedures, which have only recently started to make use of cost-benefit analyses (CBAs). The decision was taken in 2016 to automatically carry out these analyses for all transport projects costing over EUR 20 million. In order to improve benchmarking, projects will be evaluated using CBAs based on a common methodology, which is in the process of being drawn up. In accordance with best international practice this methodology will include a quantification of not only the economic impacts of projects, but also of their effects on the environment and public health, and analyses based on qualitative multi-criteria evaluation of impacts that are harder to quantify. It has also proved necessary to correct the flaws in internal project selection procedures revealed by an International Transport Forum report (ITF, 2018). This means using more reliable unit price data for these procedures, drawn from a historical database of information gathered during previous projects. Improving the selection process will also mean carrying out a risk assessment for some costs and including a quality-assurance system based on independent assessment throughout a project's development. Provisions along these lines have been included in the 2018 Slovak National Reform Programme (MoF, 2018).

These reforms will be useful. To complete the task, the authorities should also systematically publish the detailed CBAs of the projects under consideration before any decision is taken. It would also be advisable for the decision-makers to then be required to give reasons for their choices, especially those that go against the technical assessments. The creation of an independent agency responsible for selection-process quality control, like Infrastructure Australia, would also be a positive step. Such an independent body could, moreover, be responsible to systematically collect data during the planning, procurement, construction and early operating phases of transport projects and carry out regular *ex post* CBA audits (ITF, 2017).

Increasing the quality of rail and road transport

An analysis of the effectiveness of transport spending highlighted the need to increase the resources for infrastructure repair and maintenance (MoF, 2016). In the case of the rail sector this will mean rationalising and making savings on operating costs and divesting part of the rail network, which is one of the densest in Europe (MoF, 2018). The average cost per kilometre of Slovak rail transport is high—76% higher than that of the Czech Republic, for example — because of the staffing levels required to run a system in which the lines are under-automated and the use of rolling stock is sub-optimal (MoTRCD, 2016; Kubáček, 2017). A re-evaluation of the costs and benefits of less used routes is also needed. Cost-benefit analyses would help determine for which local lines subsidies are justified to keep them running and which ones should be closed and property and track sold off. In this process the authority should reconsider providing free rides for some class of passengers, including students and pensioners, which is a very inefficient way of providing social support to these population groups, if it is seen as desirable. Network maintenance could then focus on improving the operation of lines with a potential for development. Rail transport is the backbone of public transport, but cannot effectively cover zones where there are too many stations, needlessly lengthening journey times. This strategy would, however, require closer links and co-ordination with other forms of transport (coach, urban public transport and private cars), including the development of integrated pricing, allowing consumers to combine the use of different public services (train, bus and urban transport) in a given zone.

As the authorities have acknowledged, it will be necessary to devote more resources to first-class roads (MoF, 2018), and, for this to happen, they will have to reconsider the system of road infrastructure management by two different entities with separate budgets. First, they should narrow the maintenance funding gap between the National Motorway Company (NDS), which enjoys sufficient resources to guarantee the good general condition of motorways and expressways, and the Slovak Road Administration Authority (SSC) which manages first-class roads. In 2014 NDS spending on road maintenance came to an average of EUR 22 000 per kilometre, while SSC spent just EUR 5 000 per kilometre, which is a disproportionate distribution in the light of the difference in maintenance costs of motorways and roads (MoTRCD, 2016). Whereas the NDS, which is a public company, uses its own resources, generated by toll revenues (managed by satellite for heavy goods vehicles and motorway vignettes for private cars), the SSC is financed out of the government budget — insufficiently, and especially so since EU funds may not be used for maintenance work. Furthermore, the NDS uses its own machinery and labour to carry out fast network repairs when needed, but the SSC, which subcontracts most maintenance work, does not have the same level of resources. As a result it is less responsive and slow to carry out work after the winter, for example, which leads to further deterioration.

Although the transport sector's priority is to improve the efficiency of its management, it would also do well to make some adjustments to its funding. The first and most important of these concerns the maintenance of first-class roads, which urgently need additional resources. Some of the extra funds could potentially be generated by efficiency gains if, for example, the management of the road and motorway networks were merged. It would also make sense to accompany such a grouping with an increase in the new entity's own resources, as the SSC funding problem is unlikely to be solved by a better management. In general, to promote good management of transport infrastructure, it is desirable to fund the services they provide through user charges, rather than the state budget, and to include cost recovery in the price of services (Glaeser, 2016). The direct payment of these services by users would also increase discipline in the selection of investment projects. In this spirit, the use of a vignette system to collect road tolls from private cars could be extended to first-class roads for this purpose. As suggested in the 2017 Survey, pollution charges and taxes could also be raised by linking the registration tax on vehicles to their emissions levels, as is the case in most EU Member States (OECD, 2017b).

The authorities must also continue to improve the administration's capacity to mobilise European Structural Funds, which amount to almost EUR 15 billion for 2014-2020, i.e. around 3% of GDP per annum. Efficient use of these resources is needed, for example to electrify the parts of the rail network that have not as yet been electrified and that deserve to remain in operation, and to ensure interoperability with networks in neighbouring countries as part of the development of the trans-European transport system. Despite making progress in co-ordinating the management of these funds, difficulties remain because of the high rate of staff turnover, due in part to the political cycle, which is damaging to both the continuity and the institutional expertise of the administration (MoF, 2018). Greater transparency in project selection and public procurement would also help (EC, 2018b; OECD, 2017b).

Recommendations to increase the benefits of Slovakia's integration in global value chains

(Key recommendations included in the Executive Summary are in bold italics.)

Improve tertiary education

- Increase resources devoted to tertiary education and consider concentrating them on fewer, better performing, institutions.
- ***Publish high-quality analysis of graduates' labour market outcomes. Increase the time spent on general and digital training in vocational education.***
- Ensure that salaries and working conditions of tertiary-level teaching staff are adequate to attract highly-qualified professionals in all fields of study.
- Further involve businesses in higher education governance and introduce a general system of career guidance.
- Create vocational bachelor programmes and strengthen practical experience in higher education curriculum.
- Provide opportunities for management training for those with management responsibilities, especially in SMEs.

Promote research and innovation

- ***Include research collaboration with innovative companies in the assessment of universities and public research institutions.***
- Create larger, internationally visible research units and reorient HEI research funding to foster research at high international standards; adapt evaluation criteria accordingly.
- Carefully monitor the implementation of the more generous R&D tax incentives recently adopted.
- Consider providing direct support for centres of competence to strengthen public-private collaboration for research and innovation in areas such as the automotive industry.

Improve the business environment and the quality of regulation

- ***Continue to work with the ongoing Council of Europe project on judicial reform, and implement its suggestions.***
- Accelerate the handling of insolvency procedures.
- Further reduce the administrative burdens on enterprises by developing e-government, especially services to businesses, and adopt a "silence is consent" rule for administrative procedures, as and when appropriate.
- Lower licensing restrictions for legal services, architects and engineers.

Enhance transport infrastructure management and services

- Create an independent agency to monitor the quality of the project selection process.
- Introduce systematic publication of cost-benefit analyses of transport projects with mandatory justification of policy-makers' choices.
- Further improve the administration capacity to mobilise the EU structural funds thanks to greater transparency in project selection and public procurements.

Rationalise and improve maintenance of road transport infrastructure

- Create a single entity in charge of the management of motorways and first class roads.
- Consider extending the use of tolls by a vignette system for private vehicles for first class roads and linking car registration fee to their emissions to foster user funding of transport infrastructure and lower environmental costs.

Streamline railways management

- Rationalise railways infrastructure management by reducing personnel cost, implementing remote control of transport and optimising the use of rolling stock.
- Focus maintenance for railways network on the lines with a potential for development. Privatised some local routes and sell underutilised infrastructure. Enhance liaison and coordination with other modes of transport (coaches, urban public transport or private cars).

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