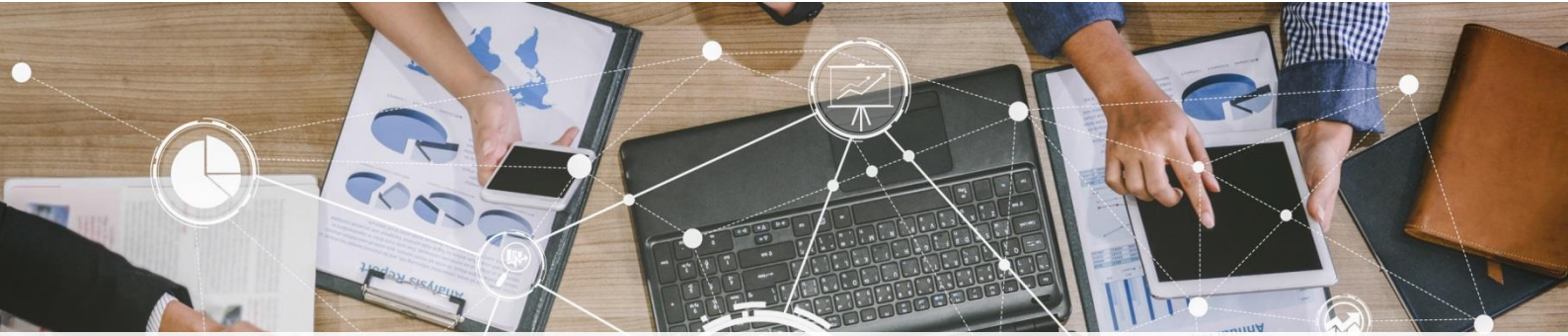

National Productivity Board of the Slovak Republic
and Institute for Strategy and Analysis,
Government Office of the Slovak Republic

Report on productivity and competitiveness of the Slovak Republic 2019

National Productivity Board of
the Slovak Republic

Inštitút pre stratégie a analýzy
Úrad vlády SR

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Federation of Employers' Association of the Slovak Republic
The National Union of Employers
The Slovak Chamber of Commerce
Supreme Audit Office of the Slovak Republic
Club 500

The National Productivity Board of the Slovak Republic is an independent and autonomous advisory body of the Government Office of the Slovak Republic, whose mission is to monitor, analyze and evaluate the development of productivity and competitiveness in the Slovak Republic.
The opinions presented in this report do not necessarily represent the official position of the Government Office of the Slovak Republic.

Executive summary

The presented Report on productivity and competitiveness maps the current economic situation in Slovakia and analyzes the state and development of the country's productivity and competitiveness.

In the first chapter of the Report, we evaluate the competitiveness of Slovakia in the context of macroeconomic indicators and international competitiveness rankings.

Today, Slovakia belongs to 30-40 most developed countries in the world. **In the period since the fall of the iron curtain until the Great Recession, the Slovak economy was approaching the level of developed countries at a rapid pace.** This is mainly due to the inflow of foreign direct investment as well as the availability of a skilled and cheap labor force.

The rate of convergence of the Slovak economy has slowed significantly in recent years. If this trend continues, our economy risks a substantial loss of competitiveness and may get caught in the middle-income trap.

According to Eurostat, Slovak exports in relation to GDP reached 96.1% in 2018, well above the EU-28 average (46.2%) and the highest value among the neighboring countries. **However, low domestic value added in exports remains problematic, suggesting that from a global standpoint, our economy still mainly serves as an "assembly plant" for international companies. To maintain and strengthen Slovakia's position in global competition, it is necessary to increase the focus on processes with greater value added.**

Our inflation rate is slightly above the rate of the price growth in the euro area. The real effective exchange rate and unit labor costs grew dynamically in the pre-crisis period, and have subsequently remained stable.

The balance of public finances has been negative over the long run. Nonetheless, public debt has been slowly declining in recent years, reflecting the fact that GDP is growing faster than the stock of debt. The high indebtedness of the state as well as of households and firms can weaken the country's macroeconomic stability. Household debt accounts for 79.1% of net disposable household income today, and private sector debt reaches 90.9% of GDP. Excessive use of debt financing can expose the private sector to significant risk and harm the competitiveness of firms, especially small and medium-sized enterprises, which are particularly vulnerable to macroeconomic shocks. Households, companies and the state have only small reserves for unexpected expenses or other negative shocks.

Slovakia's position in prominent competitiveness and business environment world rankings is relatively unfavorable in comparison with the other V4 economies as well as countries with a similar history or level of economic development. According to the World Economic Forum's Global Competitiveness Index, Slovakia is in the first third of the countries being evaluated, at 42nd place. According to the World Bank's Doing Business, our position (45th place) has deteriorated by 3 places compared to last year. Of particular concern, however, is our fall in the IMD World Competitiveness Ranking, currently 53rd out of the 63 countries surveyed, while in 2008 we claimed the 30th rank.

The second chapter analyzes the development of factors of production in various sectors of the economy.

Total factor productivity grew relatively dynamically between 2000 and 2009. The slowdown in productivity growth after the Great Recession threatens the sustainability of further convergence.

Differences in GDP per capita between the countries of Central and Eastern Europe and the EU-15 stem primarily from differences in labor productivity. **The nominal labor productivity of our economy was rapidly approaching the EU average until 2010.** Subsequently, relative labor productivity has stagnated. It is presently just above 80 % of the EU-28 average. **The gap between Slovakia and the EU average has not narrowed since 2011.**

Labor costs are increasing, having a negative impact on our country's competitiveness. The hourly labor costs in 2018 (15.9 euros in purchasing power parity per hour) amounted to 67% of the EU-28 average (23.7 euros), while hourly labor productivity was at 77%. **The era, in which the Slovak economy benefited from having a relatively cheap labor force may be coming to an end in the near future.**

Productivity in the industrial manufacturing sector has remained at the pre-crisis level. The construction sector's labor productivity is significantly lower than that of manufacturing: this suggests that the productivity growth experienced in the transition period has not extended into non-tradable sectors, such as construction. **The growth of labor productivity was significant especially in the automotive industry, thanks to highly productive foreign export-oriented companies.**

The service sector makes the biggest contribution to the value added in Slovakia, accounting for 64% of total value added. The impact of transformation is also visible: the share of value added produced by manufacturing has fallen to give way to construction and services. The share of value added is considerably more volatile in Slovakia than in the neighboring countries, especially in the industrial and energy sectors, as well as in the construction sector. This is a signal of the Slovak economy's sensitivity to external shocks and fluctuations caused by economic cycles.

The third chapter presents the relationship between investment, infrastructure and productivity.

Gross fixed capital formation shows a declining trend in the post-crisis period. Most of our investment capacity is taken up by construction and the acquisition of new machinery and equipment. **Investments in intangible assets, which have the potential to stimulate innovation and boost total factor productivity growth, such as information technology and intellectual property products, are at an alarmingly low level.**

Foreign direct investment (FDI) has significantly transformed our economy and has been a key driver of Slovakia's convergence towards more developed countries. In relation to GDP, there is a slight slowdown in the investment activities of foreign entities. **However, we remain a significant net importer of capital.** FDI of Slovak companies abroad is at a very low level and is directed to characteristically similar economies. This to some extent limits the potential benefits of outward FDI as a facilitator of technological transfer from abroad.

Slovakia lags behind the neighboring countries both in quality and in the pace of building the transport infrastructure. We also show poor performance in terms of logistical quality. Network infrastructure is at a level comparable to neighboring countries, but lags significantly behind EU leaders.

We have benefited greatly from receifing funds from the EU Cohesion Policy, but are very slow at spending them. In the 2014-2020 programming period, as of January 31, 2020, a total of 13.8 billion EUR was allocated from the European Structural and Investment Funds (ESIF). The largest part of ESIF is allocated to infrastructure projects, environmental protection and research and development

activities. **The extremely low uptake of allocated Eurofunds is a source of concern, especially in areas of research, technological development and innovation.**

In Slovakia, as in other countries, a gradual transition to alternative energy sources can be observed. **Yet, most primary energy supply still comes from fossil sources: coal, oil and natural gas. The largest increase has been recorded in biomass and waste energy, while the output of wind, solar or hydropower energy is low.** Renewable energy consumption in Slovakia is among the lowest in the EU and has even shown a slight declining trend in recent years.

The fourth chapter deals with the links between education, the labor market and productivity or competitiveness.

PISA test results reveal a worsening lag of Slovak students behind students from other countries. Pupils' results are greatly dependent on their socio-economic background. An increase in the funding for education (teachers' salaries and kindergarten infrastructure), combined with reforms to improve the quality of education would help to reverse this trend. It is equally important to make education more inclusive for disadvantaged groups at the earliest stage of schooling as possible. Slovakia ranks at the penultimate place in the EU in terms of the pre-school enrollement rate. The expansion of pre-school education, especially within marginalized Roma communities (MRC), has the potential to make a significant contribution to closing the gaps associated with different socio-economic backgrounds that children come from.

A decline in the quality of education is slowly being reflected in the deterioration of young adult's skills. A third of our jobs is under possible threat of disappearing due to automation, the highest among the OECD countries. **In the post-crisis period, the level of overqualification in the labor market has grown.** Improvement in the quality of secondary vocational education would be helpful, especially in terms of linking it more closely to industry (dual education) and ensuring that it responds dynamically to changes in the labor market and flexibly adapts curricula to new technological standards. Limited participation in lifelong learning among adults needs to be addressed as well.

Public and private R&D spending in Slovakia falls behind that in the neighboring countries and the EU average. Continuation of this situation can significantly reduce the country's innovation potential and thus its competitiveness. **University publications are at a low quality, even in comparison with similar countries. The low standards of Slovak universities, science and research lead to brain drain, both of students and researchers.** Slovakia is the second country within the OECD (after Luxembourg) in the share of students studying abroad. Slovak students often stay abroad after the completion of their studies.

Employment has risen in recent years and unemployment has fallen, but regional disparities in unemployment remain high. Improvement of road infrastructure in the country could help reduce persistent regional disparities in unemployment. **Members of MRC are disproportionately represented among the long-term unemployed.** Targeted active labor market policies and the elimination of discrimination are needed. **Gender gaps in employment and wages are high compared to the EU average.** The participation of mothers with young children in the labor market is among the lowest in the EU. Providing more flexible working arrangements, improving the supply of nurseries and kindergartens, and promoting a wider use of parental leave by men could help.

The fifth chapter focuses on institutional quality and the business environment.

Citizens' trust in institutions representing state power is low. Corruption is a major social problem in Slovakia, which hampers economic growth. Slovakia is a country moderately affected by corruption by global standards, ranking 59th out of 180 countries in terms of perceived corruption. This result is one of the worst among EU member states.

Slovakia is one of the countries with the least confidence in the justice system within the EU-28. Stronger distrust is reported only in Croatia and Italy. The proportion of appeals overturning of the original district court's decision is alarmingly high, particularly in criminal cases: half of the district court's decisions in criminal cases where an appeal was filed were overturned by the regional court. In such a situation, court decisions lack predictability, which significantly impairs the quality of the judicial system.

The bureaucracy associated with setting up a new business is well above the EU-28 average, both in terms of the number of steps and the number of days required. However, the costs associated with setting up a new business are the lowest in a regional comparison. At the same time, we have the largest share of fast-growing businesses among neighboring countries and provide room for further business growth, which positively contributes to convergence with developed countries.

In the thirty years that have passed since the end of communism and central planning, economic transformation has borne fruit in the form of modernizing the economy and significantly improving living standards. The sources of these achievements were primarily a skilled workforce, a favorable geographical location and a social consensus to undertake the necessary economic and political reforms. Thanks to substantial FDI inflows in the period before the Great Recession, Slovakia was one of the fastest growing economies in the EU. After the Great Recession, however, the impressive economic growth has not resumed and the rate of catching-up to more developed EU countries has slowed down. **Labor productivity growth is slowing, while growth of labor costs is surging ahead. Although wages in Slovakia still do not reach the EU average even after productivity differences have been accounted for, without a change in this trend, a gradual loss of price competitiveness will follow.** The successes of the Slovak economy so far have represented low-hanging fruit. We now need ambitious changes and reforms to reach the fruits on the higher branches. The National Productivity Board has identified a number of measures designed to support productivity growth of the Slovak economy and increase its competitiveness.

Ten recommendations how to increase competitiveness and prosperity of the Slovak economy

1. **Improve the business environment.** Specifically, streamline public administration, simplify communication between the state and the taxpayers (both businesses and individuals, including the simplification of tax payments), and remove complex bureaucratic demands on entrepreneurs. Promote the digital transformation of sectors and innovative activities.
2. **Eliminate corruption at all levels of government and reform the justice system.** Courts must be efficient and transparent, and their integrity should never again be called into question in the future.
3. **Restore the long-term sustainability of public finances.** This will require (after the crisis period caused by the COVID-19 pandemic) in particular, cuts in the costs of the pension system (e.g. the abolition of the pension ceiling and the 13th pension payments), improved tax collection and reductions in non-investment state expenditure that does not provide sufficient value for money. Create sufficient reserves for greater resilience of public finances and the economy to external shocks.
4. **Continue in the Value for Money project in the field of public administration.** Consistently apply the recommendations given in the project's spending reviews.
5. **Prioritize transport infrastructure projects.** Prioritize the construction and reconstruction of sections with the highest value for money. Connect the key urban centers in Slovakia with each other by means of high-quality motorways or expressways.
6. **Support science and research in firms, universities and public research institutes, and financially motivate their cooperation.** Fund universities in a way that incentivizes them to produce research in cooperation with the private sector and which attains international standards. This should be reflected in the volume of public-private cooperation projects and publishing activity in high-quality peer-reviewed international journals. Reward internationally competitive universities and terminate or significantly reduce research support given to sub-standard universities. Allow science parks and research centers to rent out their premises and acquire legal personality.
7. **Implement a graduate career mapping system through the use of administrative data and data from graduate and employer surveys.** Stop brain drain using a combination of tools that address the main reasons why qualified young people leave the country.
8. **Improve the quality of education at all levels, from primary schools to universities.** Promote an in-depth curricular reform focusing on IT and other key skills (e.g. reading comprehension, communication skills, teamwork, complex problem solving and critical thinking).
9. **Continue to increase employment.** In particular, ensure higher participation of workers of pre-retirement and retirement ages and substantially simplify employment conditions for people from third countries. Motivate jobseekers with low employability, support their employment through active labor market measures and improve the profiling of jobseekers at the point of registeration in order to determine the level of long-term unemployment risk.
10. **Deepen the social support system for families living in deep poverty and strengthen the inclusion of children from families at risk of poverty or social exclusion.** Support the provision of early intervention for children aged 0 to 3 years living in a socially disadvantaged environment, and in particular in marginalized Roma communities. Ensure that children from disadvantaged families attend kindergarten from the age of three. Support inclusive education, including increasing staff capacity in kindergartens and primary schools, so that schools are able to meet the specific needs of disadvantaged children. Limit grade retention and dropout of these children from primary schools, enabling them to get into secondary schools and obtain education with real employability prospects in the labor market.

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AMN	Assistance of material need
CPI	Corruption Perception Index
DESI	Digital Society and Economy Index
EIS	European Innovation Scoreboard
GCI	Global Competitiveness Index
GDP	Gross domestic product
IMD	International Institute for Management Development
GII	Global Innovation Index
H-index	Hirsch index
ISCED	International Standard Classification of Education
ISCED0	Pre-primary education
ISCED1	First stage of primary education
ISCED2	Second stage of primary education and lower grades of 8-year grammar schools
ISCED3	Upper secondary education
LPI	Logistics Performance Index
MRC	Marginalized Roma communities
NBS	National Bank of Slovakia
NEET	Not in Education, Employment or Training
OEC	Observatory of Economic Complexity
OECD	Organisation for Economic Co-operation and Development
p.p.	Percentage points
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for international Student Assesment
FDI	Foreign direct investment
TFP	Total factor producivity
SO SR	Statistical Office of the Slovak Republic
WEF	World Economic Forum
VA	Value added
Abbreviations of territotial units:	
EU	European Union
EA	Euro Area
V4	Visegrad group
AT	Austria
AU	Australia
CH	Switzerland
CZ	Czechia
DE	Germany
DK	Denmark
EL	Greece
FR	France
HU	Hungary
IL	Israel
IR	Iran
IS	Iceland
NL	the Netherlands
NO	Norway
PL	Poland
RS	Serbia
SK	Slovakia
SR	Slovak Republic
UA	Ukraine
UK	the United Kingdom
US	the United States

BA	Self-governing Region of Bratislava
BB	Self-governing Region of Banská Bystrica
KE	Self-governing Region of Košice
NR	Self-governing Region of Nitra
PO	Self-governing Region of Prešov
TN	Self-governing Region of Trenčín
TT	Self-governing Region of Trnava
ZA	Self-governing Region of Žilina

Introduction

"Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker."
Paul Krugman, Nobel Prize laureate in economics

Competitiveness is the key to economic growth and prosperity in a globalized world. Since the turn of the century, however, nations across Europe have seen declines in their productivity growth rates– especially in terms of labour productivity growth. In response to this rather concerning trend, the European Council has recommended EU member states to establish National Productivity Boards.[1] The Council's recommendation is primarily directed at member states that have accepted the euro as their common currency, and have thus given up exchange rate flexibility as an instrument of economic policy. Naturally, exchange rates and monetary policy in the euro area can only respond to shocks that affect the monetary union as a whole. Consequently, euro area member states have lost an important tool that was previously available to them in the event of an asymetric shock affecting their economy disproportionately. National Productivity Boards can help these eurozone members (as well as EU member states that have not accepted the euro, but have nonetheless decided to set up a National Productivity Board) identify such macroeconomic inbalances and threats, as well as put forward policy recommendations that would neutralize the threats and support the productivity growth and competitiveness of their economies. This process can in turn help stimulate economic growth in individual EU member states, as well as in the EU and euro area as a whole.

To this day, 13 euro area member states, as well as three EU countries outside the euro area, have set up their National Productivity Boards.[2] Slovakia has joined these countries in September 2019, establishing its own National Productivity Board. The National Productivity Board of the Slovak Republic (NPB SR) consists of representatives of analytical units of selected ministries, as well as experts representing various fields of the economy. The main output of the NPB is the annual *Report on productivity and competitiveness of Slovakia*, which we hereby present to the wider public.

[1] Recommendation of the Council from September 20, 2016 regarding the establishment of National Productivity Boards, Offical Journal of the European Union, 2016/C 349/01.
[2] The following countries have already set up their NPBs at the time of writing: Belgium, Cyprus, France, Greece, the Netherlands, Ireland, Lithuania, Latvia, Luxemburg, Malta, Germany, Portugal, and Slovenia, as well as Denmark, Hungary and Romania.

1 Macroeconomic development and the competitiveness of Slovakia from an international perspective

An analysis of challenges and opportunities in the area of productivity and competitiveness requires a thorough knowledge of the present state of the Slovak economy. Therefore, the first chapter examines the evolution of the main macroeconomic indicators, as well as our country's position in multiple prominent world competitiveness rankings. For comparison purposes, we present data on Slovakia, as well as on countries that are close to us geographically, economically and historically: namely, the Visegrad Group (V4) and Austria.

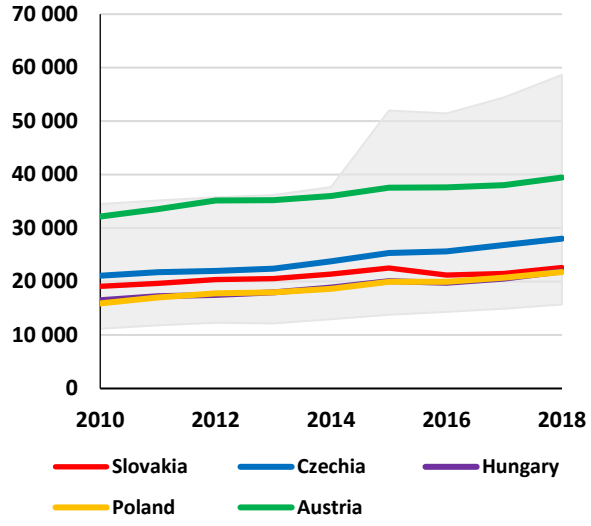
1.1 Macroeconomic development

Catching up to the EU average

When 30 years ago, Slovakia– then a part of Czechoslovakia– decided to end its communist experiment and embark on a journey back to market economy and democracy, it was a society characterized by a highly qualified labor force, yet at the same time falling far behind the rest of Europe technologically and economically. Since then, Slovakia has made significant progress in its *return to Europe*: it has become a member of the EU, NATO and OECD, and now ranks among the top 30-40 most developed countries in the world. In 2018, Slovakia's GDP per capita expressed in purchasing power parity was 22,620 euros (Figure 1.1), which represents 73.1% of the EU-28 average (Figure 1.3). In 2001, the GDP of Slovakia was merely 52.1% of the EU-28 average. Slovakia has thus grown at a much higher pace than other European countries over the past two decades, as depicted in Figure 1.2.[3] On the other hand, the gap between the Slovak growth rate and the EU average has been decreasing in recent years. While in the pre-crisis period, the Slovak economy grew multiple times faster than the European average (by more than 7 percentage points in 2007), this difference has significantly shrunk following the crisis, and was estimated to be less than 1 percentage point in 2019. According to the European Commission forecast (not taking into account the economic impact of the COVID-19 pandemic), Slovakia is expected to grow at a steady rate of 2.6-2.7% in the coming years, while the EU-28 member states are forecast to grow on average at 1.4% over the next 3 years. Thus, the medium-term outlook does not indicate a renewed pace of catch-up in any significant manner.

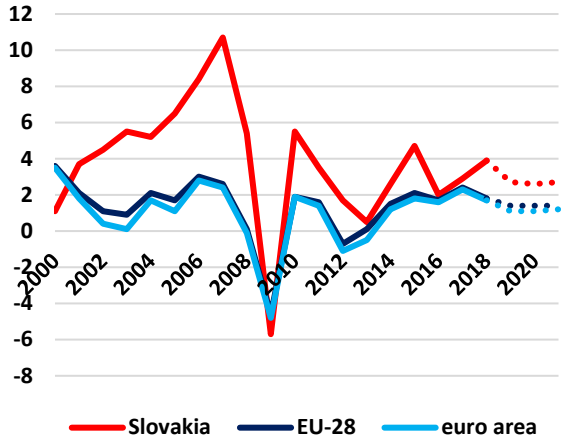
[3] The rapid increase in the maximum value between 2014 and 2015 are, according to the OECD, attributable to the movement of economic activities and intellectual property of multinational corporations to Ireland- revenues of these firms arising from intellectual property have began to be accounted to the Irish GDP, which has caused a year-on-year jump of approximately 38 % in GDP per capita.

Figure 1.1: GDP per capita (in thousands of EUR)



Source: Eurostat.
Note: Values are expressed in current prices at purchasing power parity. The gray band captures the range of values recorded in the EU as a whole. The range does not include Luxembourg for extreme values. The decline in GDP per capita in Slovakia at current prices in 2016 is due to a fall in the price level by 0.5% in that given year.

Figure 1.2: Growth in real GDP per capita, comparison with the EU (in %)



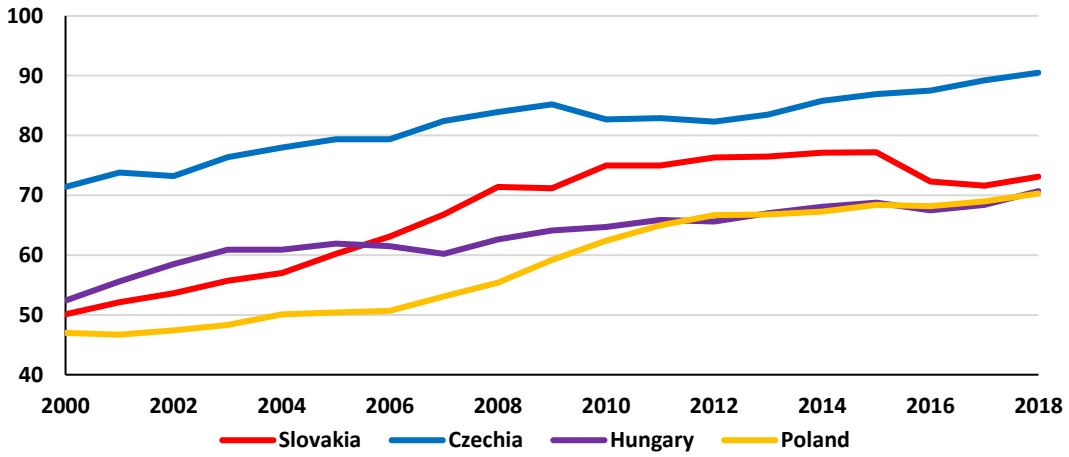
Source: Eurostat and the European Commission (forecast).
Note: Dotted lines represent forecast values.

Prior to the Great Recession, the Slovak economy was converging to the level attained in the other EU countries at a rapid pace, mainly due to the inflow of foreign direct investment, which led to the accumulation of capital and helped stimulate rapid productivity growth (Peciar and Wittemann, 2019). The attractiveness of Slovakia (as well as other Central and Eastern European countries) for foreign investors was based on the relatively low initial level of capital. Other factors also included a change in sectoral structure, i.e. the transition from a predominantly agrarian society to an export-oriented economy, and the shift in export orientation from traditional markets within the former Soviet bloc towards more developed Western economies. Last but not least, foreign investors also appreciated the quality of human capital, which, combined with relatively low wages, was a significant factor affecting pre-crisis economic growth.

The slowdown in the productivity growth of the Slovak economy and the slowdown in convergence to the EU-28 average[4] reflect an inefficient allocation of resources (Peciar and Wittemann, 2019; Grela et al., 2017), rising labor costs and a fall in the labor productivity growth rate below the growth rate of the labor costs. As a result, Slovakia currently faces the risk of falling into the middle-income trap: a term used to describe a situation whereby a less developed country successfully converges from a relatively low income level to a medium level at first, but subsequently stops its convergence process and, instead of further growth, the country stagnates in the long term. The transition from low to medium income level is relatively simple and may be compared to picking low-hanging fruit. The Slovak economy has already completed this phase and must now further increase its productivity and competitiveness in order to be able to reach the fruits on higher branches.

[4] Due to the transitional phase the United Kingdom is presently at, EU values presented throughout this Report still include the UK.

Figure 1.3: Convergence of GDP per capita to the EU-28 average in PPP, current prices (in % of EU-28 average)



Source: Eurostat.

International trade

The generally accepted consensus among economists is that openness to trade helps countries develop more quickly. Although opening up to external actors may be met with displeasure among domestic producers, the positive-sum nature of international trade has long been recognized since the times of Adam Smith or David Ricardo Indeed, countries more open to foreign trade have been found to experience a positive effect on productivity, as a large number of empirical studies confirm (e.g. Edwards, 1998; Miller and Upadhyay, 2000; Wong, 2006). By increasing the production capacity in order to cater to the foreign demand, companies are able to reduce unit production costs and benefit from economies of scale. Likewise, international trade allows domestic firms to access new technologies and production processes from abroad, while at the same time exposing them to more competition (World Economic Forum, 2015), in turn leading to increases in efficiency and cost reductions.

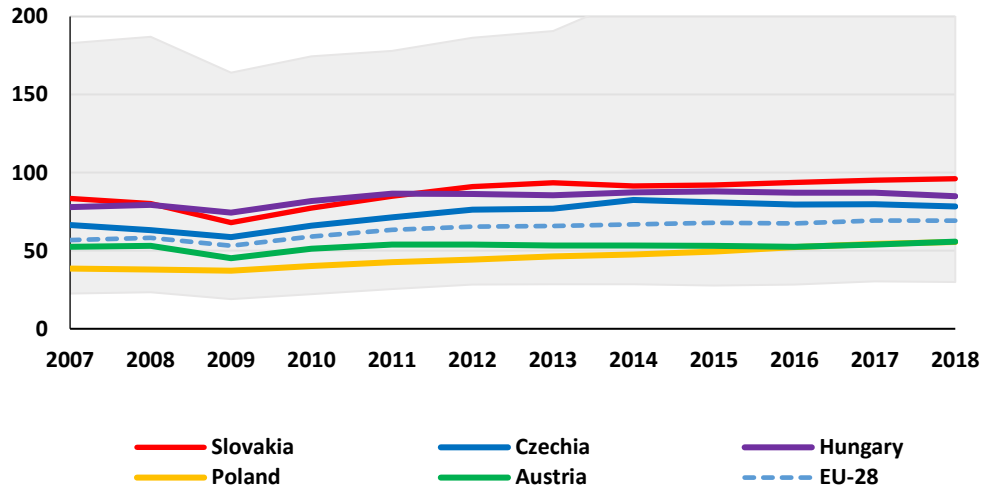
At the same time, if we interpret the concept of competitiveness as a country's ability to sell its goods and services globally, the extent to which Slovakia is successful in terms of international trade may be be seen as a reflection of the state of our competitiveness. According to Eurostat, Slovak exports in relation to GDP reached 96.1% in 2018— well above the EU-28 average (46.2%) and the highest among neighboring economies (Figure 1.4). The Economic Complexity Index 2017 of the Observatory of Economic Complexity (OEC) also names Slovakia as the 39th most important export economy in the world and the 16th most complex. Yet, what is problematic is the low domestic value-added of exports in comparison with neighboring countries as well as with the EU-28 average (Table 1.1). According to OEC, Slovakia's most important export category is automobiles, which accounts for 20% of total exported goods, followed by vehicle parts (7.1%) and video displays (6.4%). The low domestic value-added of exports thus suggests that the Slovak economy largely continues to serve as an "assembly plant" for international companies. Hence, in order to maintain and strengthen our position from a global standpoint, it becomes necessary to increase our focus on processes with greater value-added.

Table 1.1: Value added of gross exports (in %)

	2005	2007	2009	2011	2013	2015	2016
Slovakia	57.01	53.9	58.11	53.26	53.23	55.22	55.49
Czechia	65.57	63.67	66.67	61.34	61.09	60.72	62.33
Hungary	55.99	54.14	56.51	52.17	53.93	56.9	55.86
Poland	75.32	72.35	75.64	71.6	72.68	73.36	73.1
Austria	74.52	73.36	76.69	70.26	70.53	73.5	73.42
EU-28	89.59	88.24	89.18	85.99	86.48	87.85	88.37

Source: OECD.

Figure 1.4: Export of goods and services (in % of GDP)

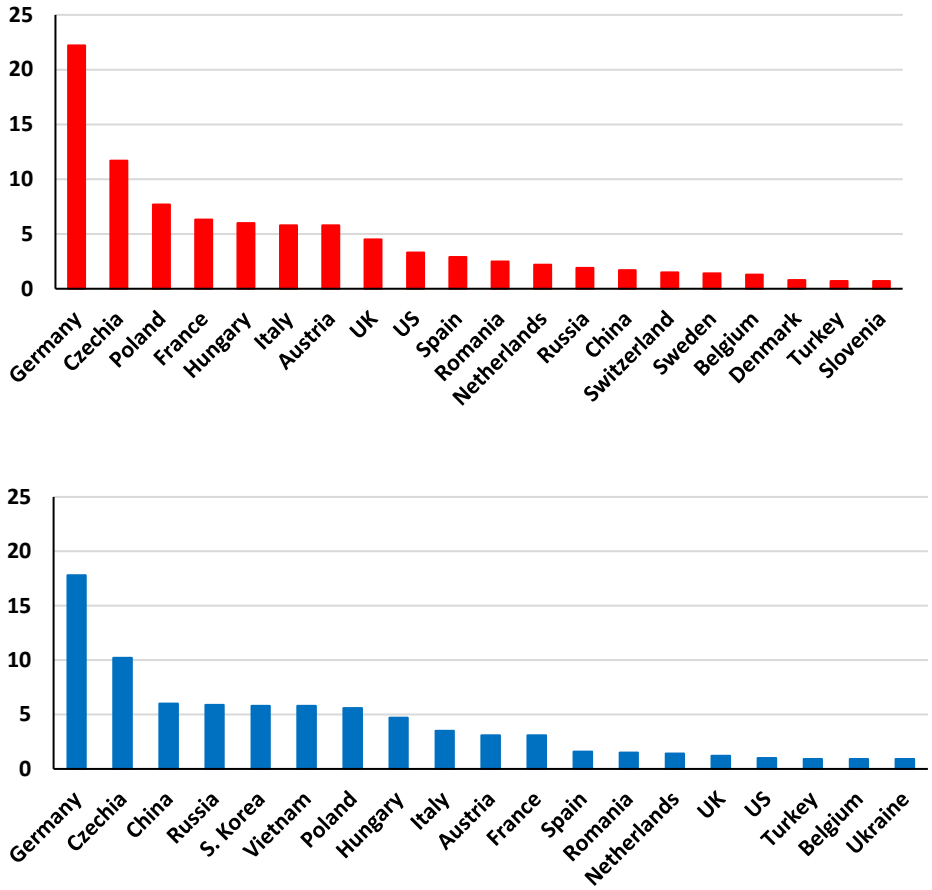


Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. Luxembourg, Malta and the Republic of Ireland are characterized by high international openness given by the prominence of their export-oriented service sectrors and consequently widen the EU range in a significant manner.

Structural declines in competitiveness can also be captured by a change in export market share. It would be especially worrying if a country‘s share were falling steadily over a longer period of time. Losses in the market share of exports can occur as a result of a decline in the country's exports, but also if domestic and world exports do not grow at a same rate, resulting in the deterioration of the country's relative position. We can observe that the Slovak market share of exports of goods and services in world exports declined between 2009 and 2013, most likely due to the Great Recession. In this regard, the Slovak economy was hit by the crisis in a similar manner to Czechia, worse compared to Poland, and less than Hungary and Austria (Table 1.2). The subsequent slowdown between 2016 and 2018 occured in parallel to the slowdown of convergence discussed in the previous subchapter. It can also be seen that the Slovak economy is particularly vulnerable in its service exports, which fluctuate significantly more than the export of goods: in the period of and immediately follwing the crisis, Slovakia's share in world exports of services has dropped dramatically.

Germany is the most important trading partner for Slovakia today, in terms of both exports and imports (Figure 1.5). Over a fifth of Slovak exports go to Germany, and 17.8% of total imports come from Germany. Slovakia's standing in foreign trade is therefore strongly dependent on the macroeconomic situation this one trading partner finds itself in. Other major trading partners are primarily EU member states, while numerous Asian countries characterized by relatively low costs of production are also represented in imports, such as China or Vietnam. The United Kingdom's share in Slovak exports stood at 4.5%. Hence, if Brexit were to be carried out without a subsequent trade agreement (the so-called hard Brexit), it could have a non-negligible impact on Slovak industry. Likewise, export duties introduced by the US at the end of 2019, which mainly apply to the food and aviation sectors, may also have a negative impact on Slovakia‘s international trade performance.

Figure 1.5: Total exports (above) and imports (below): breakdown by country (2018, in %)



Source: SO SR.

Table 1.2: Change in market shares of exports of goods and services (in %)

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Goods and services (% of world exports - 5 year change)	Slovakia	9.50	3.83	-2.78	-10.30	-4.08	1.88	4.06	7.31	5.15	3.20
	Czechia	27.16	11.70	7.39	-4.48	-9.77	-6.24	-2.16	2.44	8.56	11.90
	Hungary	10.25	0.79	-4.32	-23.17	-22.85	-16.82	-9.31	-2.11	10.82	8.44
	Poland	34.41	24.68	15.13	1.39	-0.26	4.68	9.18	17.73	27.95	25.75
	Austria	-6.08	-12.62	-12.5	-21.72	-18.42	-15.75	-9.15	-2.83	2.7	3.92
Goods (% of world exports - 5 year change)	Slovakia	17.69	10.67	2.28	-7.89	-1.56	2.11	6.92	10.49	7.14	4.67
	Czechia	33.44	11.74	7.85	-5.37	-8.17	-4.56	2.47	7.87	13.23	14.60
	Hungary	12.55	1.27	-6.21	-26.00	-25.23	-18.73	-8.56	-0.76	11.84	8.85
	Poland	35.24	23.93	14.33	1.51	0.83	3.99	12.25	21.37	30.90	25.54
	Austria	-6.93	-11.87	-11.85	-22.98	-19.47	-16.50	-9.17	-2.60	3.13	5.77
Services (% of world exports - 5 year change)	Slovakia	-26.81	-33.66	-35.26	-30.33	-20.37	-4.87	-0.96	11.97	13.39	7.80
	Czechia	4.36	13.04	5.47	-0.33	-17.33	-16.20	-18.72	-14.25	-5.92	4.97
	Hungary	2.60	-0.84	5.40	-8.67	-10.65	-9.01	-10.55	-5.27	8.46	7.80
	Poland	33.72	29.00	19.15	0.66	-4.64	6.91	-0.60	7.25	19.28	28.67
	Austria	-6.84	-15.68	-14.74	-17.46	-16.28	-12.93	-12.26	-8.60	-3.37	-4.29

Source: Eurostat.

Note: The unit is percent of world exports—5 year change, extracted from balance of payment data.

Macroeconomic stability

Macroeconomic stability is a crucial prerequisite for the competitiveness of an economy (Loser, 2008). As Nela, Muja and Metin (2019) point out, it is very challenging to prosper in an environment characterized by constant uncertainty and instability— firms in countries with out-of-control inflation have difficulty making informed decisions, the public sector's capacity to provide its citizens with the necessary services is constrained when it is bound by a large debt burden, and foreign investors are forced to re-evaluate a country's suitability as a destination for their capital in the light of a highly fluctuating currency (Porter and Schwab, 2008). At the same time, authors emphasize that macroeconomic stability is a necessary but not a sufficient condition for maintaining competitiveness or productivity. On the other hand, macroeconomic instability in the economy can significantly impede economic growth and affects a wide range of related indicators. In this section, we will therefore focus on assessing the level of inflation and exchange rate developments, as well as the level of public and private sector debt in Slovakia. While the analyzed indicators for Slovakia mostly show patterns similar to neighboring countries, potential threats in terms of macroeconomic stability can be identified in the areas of inflation rate and private debt: inflation rate by farexceeds the EU-28 level and euro area averages, and Slovak firms and households are significantly more indebted than the rest of the V4 economies.

Inflation

It is the responsibility of the European Central Bank to maintain price stability of the euro area, which it defines as average annual inflation rate below 2%. A higher rate of inflation compared to other eurozone countries may negatively affect the international competitiveness of domestic products, as the single currency eliminates the possibility of using monetary policy to regain competitiveness at the level of individual member states. Despite different currencies, trajectories of consumer prices in the V4 countries do not differ fundamentally. Yet at present, inflation rates in Slovakia and its neighboring countries are well above the euro area price-level growth rate (see Table 1.3). According to the forecast of the National Bank of Slovakia from the last quarter of 2019, the HICP inflation rate is expected to remain above 2% in the coming years (namely, 2.5% in 2020, 2.1% in 2021, and 1.7% in 2022). A higher rate of inflation in countries experiencing productivity growth is somewhat natural and reflects the so-called Balassa-Samuelson effect[5]. In this regard, if prices are rising on the background of rising productivity, it may not have an adverse impact on the economy. On the other hand, the situation becomes unsustainable if the price level continues to rise despite a slowdown in productivity growth. In terms of competitiveness, a mismatch between growth in labor productivity and growth in labor costs is particularly dangerous. Slovakia may now be on the verge of such a situation.[6]

[5] In short, this effect is based on the observation that productivity growth in tradable sectors (e.g. manufacturing) leads to rising incomes in these sectors. In turn, the higher wages in the tradable sectors put pressure on non-tradable sector wages (such as various services) despite no productivity growth taking place. Such growth in wages is followed by a higher rate of growth in the overall price level.

[6] Chapter 2: Productivity of factors of production, explores this topic further.

Table 1.3: Average annual rate of inflation based on the harmonized index of consumer prices (HICP) (in %)

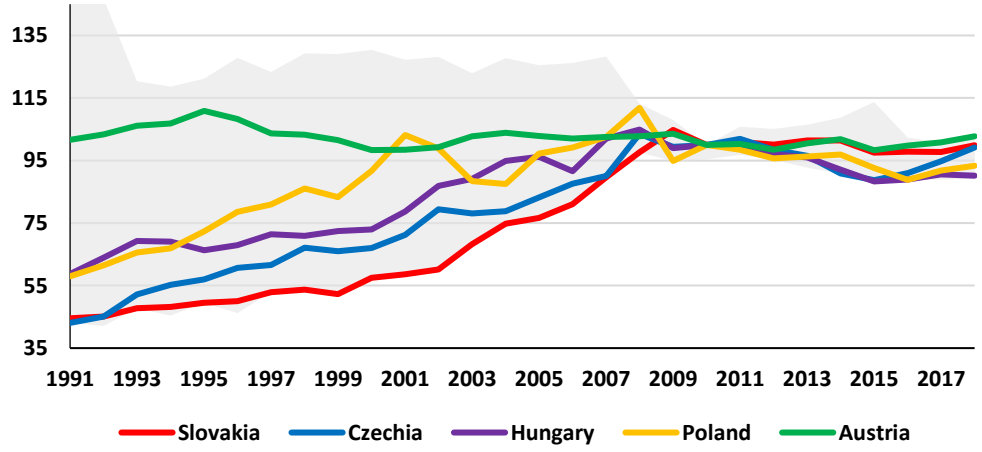
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Slovakia	3.9	0.9	0.7	4.1	3.7	1.5	-0.1	-0.3	-0.5	1.4	2.5	2.8
Czechia	6.3	0.6	1.2	2.2	3.5	1.4	0.4	0.3	0.6	2.4	2	2.6
Hungary	6	4	4.7	3.9	5.7	1.7	0	0.1	0.4	2.4	2.9	3.4
Poland	4.2	4	2.6	3.9	3.7	0.8	0.1	-0.7	-0.2	1.6	1.2	2.1
Austria	3.2	0.4	1.7	3.6	2.6	2.1	1.5	0.8	1	2.2	2.1	1.5
EU-28	3.7	1	2.1	3.1	2.6	1.5	0.6	0.1	0.2	1.7	1.9	1.5
eurozone	3.3	0.3	1.6	2.7	2.5	1.3	0.4	0.2	0.2	1.5	1.8	1.2

Source: Eurostat.

Exchange rate

With the introduction of the euro, Slovakia renounced its national currency and the nominal exchange rate has been fixed. Exchange rate risk vis-à-vis other euro area partners has thus been eliminated and the risk vis-à-vis partners outside the euro area has been reduced. The nominal exchange rate with our main trading partners, i.e. euro area countries, is now static. Yet, for an objective evaluation of the development in national competitiveness, it is necessary to analyze the trajectory of the so-called effective exchange rate. The effective exchange rate is a relative measure of the value of domestic currency against a basket of foreign currencies, with the weight of each currency reflecting the intensity of foreign trade with that country. In order to truly capture a country's price or cost competitiveness, however, it is important to take into account also the differences in costs and prices among individual countries. Hence, it is appropriate to use an exchange rate deflated by the consumer price index or another price deflator (the so-called real effective exchange rate, or REER). Slovakia reported a relatively fast growth in REER up to the Great Recession (Figure 1.6), similar to, albeit faster than, other V4 countries. It should be noted that a faster rise in prices is natural for countries of Central and Eastern Europe due to the aforementioned Balassa-Samuelson effect. Since the end of the Great Recession, the Slovak REER remains roughly constant.

Figure 1.6: Real effective exchange rate (index)



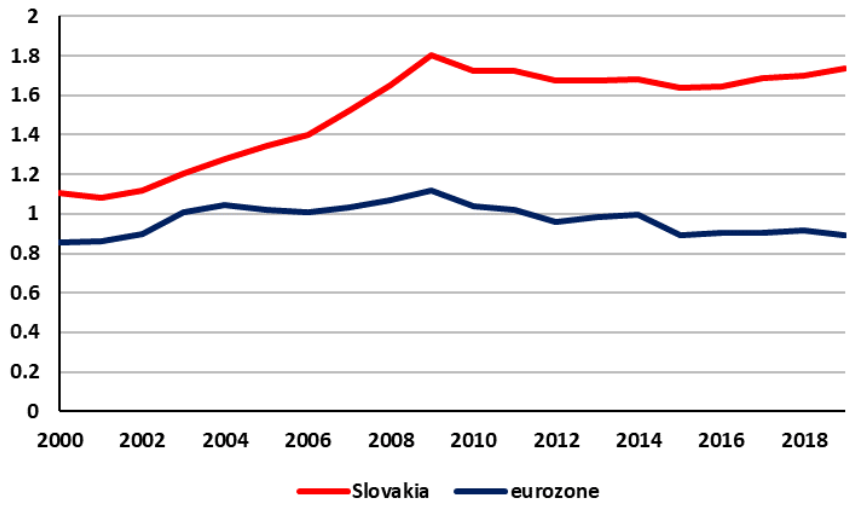
Source: World Bank.
Note: REER taking consumer prices into account. The gray band captures the range of values recorded in the EU as a whole. EU range does not include Lithuania, Estonia and Slovenia. The range captures data for Croatia between 1997 and 2016 only. The base of the index is 2010, whereby 2010=100.

Harmonized competitiveness indicators (HCI)

Harmonized competitiveness indicators are based on unit labor costs of the overall economy. The benchmark for the below-presented index is the first quarter of 1999, which is assigned a value of 100. The purpose of HCI is to provide comparable measures of price and cost competitiveness in the eurozone, in line with the REER of the euro. Consequently, for this section we present a comparison of Slovakia with the euro area rather than the V4 countries.

The ratio of compensation per employee to their labor productivity represents a unit labor cost. Labor productivity is expressed as GDP at constant prices per employee according to quarterly national accounts. As Figure 1.7 shows, a stagnation of HCI based on unit labor costs followed the Great Recession in Slovakia, until unit costs began to rise again in recent years. This implies that labor costs in Slovakia generally tend to grow faster than labor productivity. This negative trend in HCl is similar to that observed in REER. If Slovakia stays on this trajectory, the economy faces the risk of a significant loss of competitiveness.

Figure 1.7: HCI based on unit labor costs (index)



Source: European Central Bank.

Table 1.4: Harmonized competitiveness indicators

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Unit labor costs	SK	1.11	1.08	1.12	1.21	1.28	1.34	1.40	1.52	1.65	1.80	1.73	1.73	1.68	1.68	1.68	1.64	1.64	1.69	1.70	1.74
(%, change against 1999)	EA	0.86	0.86	0.90	1.01	1.04	1.02	1.01	1.03	1.07	1.12	1.04	1.02	0.96	0.99	1.00	0.89	0.90	0.91	0.92	0.89
Consumer price index	SK	1.12	1.14	1.17	1.34	1.47	1.50	1.58	1.73	1.87	1.99	1.90	1.91	1.91	1.93	1.93	1.86	1.86	1.86	1.89	1.91
(%,change against 1999)	EA	0.86	0.87	0.90	1.01	1.05	1.02	1.02	1.03	1.05	1.06	0.97	0.97	0.92	0.95	0.95	0.87	0.89	0.90	0.94	0.92
GDP deflator	SK	1.10	1.10	1.13	1.24	1.34	1.38	1.44	1.56	1.69	1.75	1.69	1.68	1.66	1.66	1.64	1.57	1.56	1.56	1.57	1.57
(%,change against 1999)	EA	0.86	0.86	0.89	1.00	1.03	1.01	1.00	1.02	1.03	1.04	0.96	0.94	0.88	0.91	0.91	0.83	0.85	0.86	0.87	0.86

Source: European Cental Bank.

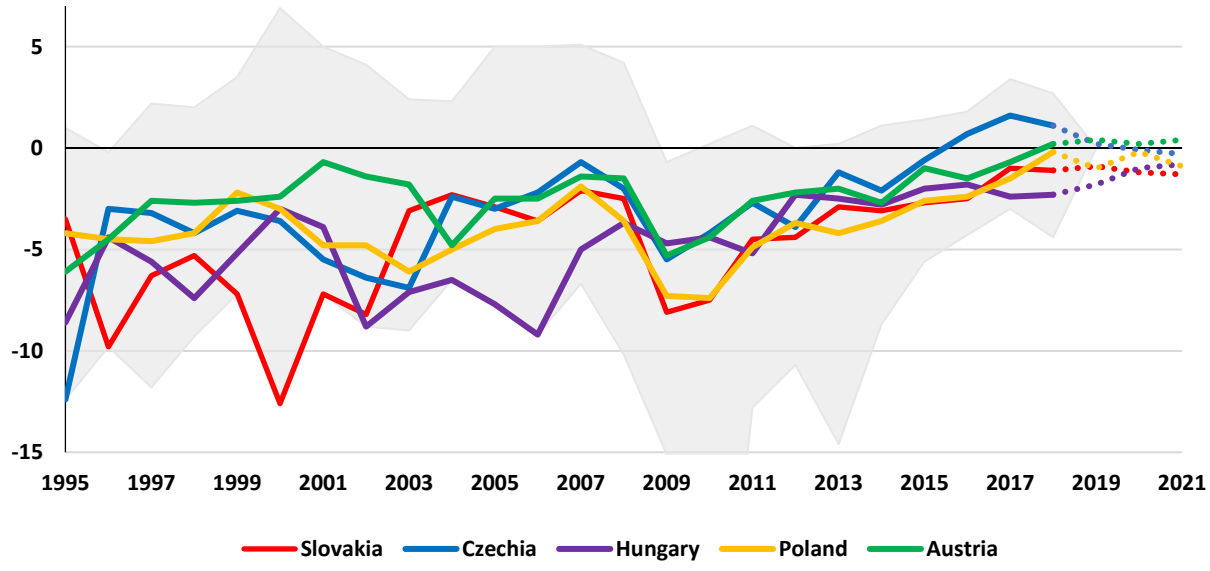
Table 1.4 presents HCI based on unit labor costs, the consumer price index and the GDP deflator, whereby yearly change against the year 1999 is shown. If we look at the competitiveness of the Slovak economy from the viewpoint of the consumer price index, we can see that prices have doubled since the base period (Q1 1999). Meanwhile, the consumer price index of the eurozone was stagnant throughout the period. HCI based on the GDP deflator grew 1.6-fold since 1999, although it has remained largely stagnant since 2015. The GDP deflator-based HCI in the euro area has been on a declining trend since 2010, falling below the 1999 level.

National budget and public debt

The Stability and Growth Pact of the European Union lays down the obligation for the euro area member states to keep their gross government debt below 60% of GDP and not to exceed a deficit level of over 3% of GDP.[7] Historically, the Slovak deficit fluctuated well above the 3% threshold over a relatively long period, and between 1999 and 2002, Slovakia ran the highest deficit among the EU-28. Today, however, Slovakia has a more balanced budget, with the deficit value closely mimicking the EU-28 average and the neighboring countries (Figure 1.8).

In reality, the range in the size of the public debt among the EU-28 countries is extremely broad, as Figure 1.9 shows. Some countries, such as Estonia, have their debt below 10% of GDP, while in Greece the figure reaches nearly 180%. However, high public debt is not only a Greek problem - many European economies have debt exceeding their GDP (e.g. Portugal, Italy, Cyprus or Belgium). In this respect, Slovakia finds itself close to the EU average, with its debt kept below the 60% mark throughout the examined period. Compared to other neighboring states, however, it can be seen that the level of public debt is more volatile in Slovakia: between 1995 and 2018, two cycles of growth and subsequent decline are observed. This seemingly cyclical development can be only partially explained by economic cycles— namely, the increase in debt between 2008 and 2013 is attributable to the Great Recession. Recently, Slovak public debt has stabilized, yet it has been declining only slightly, despite the country's favorable economic performance. Given that the government budget remains in deficit, the decline in public debt reflects the fact that GDP is growing at a faster pace than debt: that is, the ratio of public debt to GDP is decreasing, while its absolute value is not.

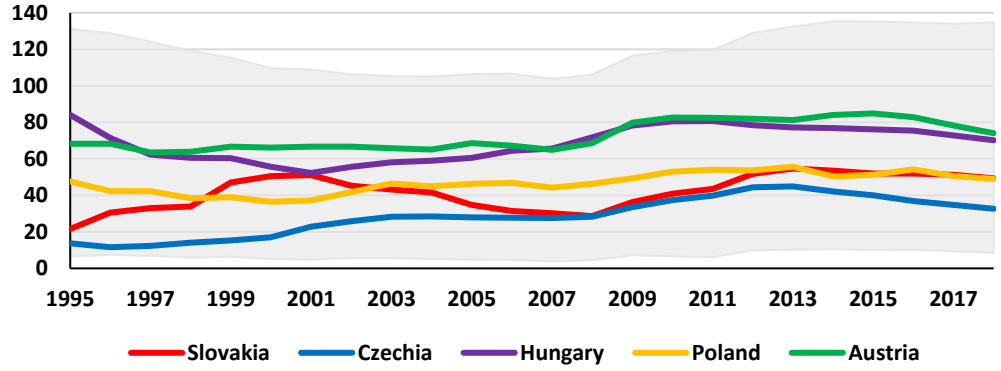
Figure 1.8: Budget balance (in % GDP)



Source: Eurostat and European Commission.
Note: Dotted lines represent European Commission forecasts. The gray band captures the range of values recorded in the EU as a whole. The EU range includes incomplete data for Luxembourg, Croatia and Greece. The minimal value for 2010 was -32.1%, recorded in Ireland.

[7] Later reforms of the Pact established more stringent medium-term budgetary policy targets in order to achieve a balanced budget, as well as to ensure that the level of government debt is constantly converging to 60%.

Figure 1.9: Gross public debt (in % GDP)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. Values for Greece have been omitted from the range for extreme values.

Household and firm debt

Highly indebted households and firms may also pose a threat to macroeconomic stability. Indeed, OECD (2017b) warns that such highly indebted countries may be sensitive to financial shocks, hindering medium-term growth prospects. While the authors recognize that debt financing of households and firms serves to support economic activity and that a high level of debt does not necessarily imply financial difficulty, they also warn that the average household indebtedness in high-income economies presently lies at an all time high with growth in disposable income not keeping up with growth in indebtedness. Such reality exposes high-income countries to a significant level of risk in the case of a sudden or unforeseen macroeconomic shock.

Based on OECD as well as Eurostat data, Slovakia was the second most indebted country in the region in 2018, behind Austria. Household debt makes up 79.1% of the net disposable income in Slovakia (Table 1.5) and private sector debt stands at 90.9% of GDP (Table 1.6). This may be partially explained by the fact that Slovakia, as the only V4 country that is a member of the eurozone, was directly influenced by the expansionary monetary policy of, and the low interest rates set by, the European Central Bank following the Great Recession. The growth in private sector debt in the 10-year period between 2008 and 2018 has truly been substantial—with an average annual growth rate of 3.7%, indebtedness has risen from 64% of GDP to 90.9%. Excessive use of debt financing may hurt the competitiveness of the private sector, especially small and medium-sized enterprises, which tend to be most vulnerable to crises and shocks.

The greatest share of the increase in debt volume is attributable to mortgages and household borrowing (Figure 1.10). Lending for house purchases in nominal terms grew at an average annual rate of 14.5% between 2006 and 2018, whereas loans to households expanded by 16.7% on average in the period between 2000 and 2018[8]. Naturally, the interest rate is a crucial factor determining the volume of debt in an economy. Since the turn of the millennium, a gradual decline in interest rates is observed across all categories of loans, with interest rates on mortgages marking the most significant drop— the interest rates in 2004 were almost four times higher than the 2018 levels (Figure 1.11).

[8] The value is calculated as a geometric average.

Table 1.5: Household indebtedness (in % of net disposable income)

	2014	2015	2016	2017	2018
Slovakia	64.65	68.49	74.38	79.11	79.42
Czechia	66.66	67.20	68.79	65.72	69.94
Hungary	55.48	48.33	45.95	42.96	41.61
Poland	61.74	63.80	63.57	62.02	-
Austria	90.48	92.05	92.07	90.80	90.27

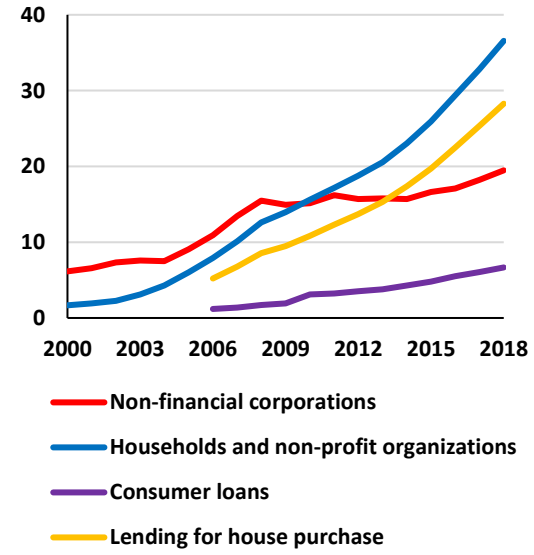
Source: OECD.
Note: The measure of household indebtedness expresses the ratio of all liabilities of households, which are subject to interest payment and have a maturity date, to the net disposable income.

Table 1.6: Private sector indebtedness (in % GDP)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Slovakia	64	68.4	66	69.5	71.1	75.2	79	80.6	88.6	94.5	90.9
Czechia	63.8	65.9	67.9	68.3	70.7	73.7	71.5	68.1	68.7	67.3	70.8
Hungary	104.7	115.9	114.4	113.6	101.1	94.6	90.7	83.2	76.6	70	69.3
Poland	67.3	67.1	69.7	73.9	73.4	75.4	78.1	78.9	81.6	76.5	76.1
Austria	126.7	131.9	132.3	129.4	128.2	127.1	124.8	124	123.5	121.8	121

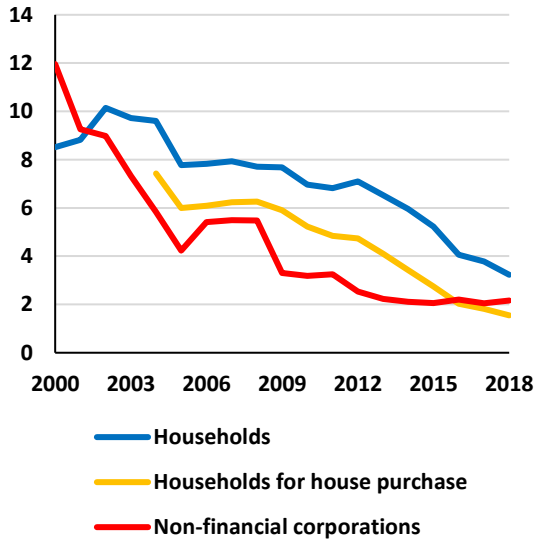
Source: Eurostat.
Note: Private sector indebtedness captures all liabilities of non-financial organizations, households and non-profit organizations.

Figure 1.10: Debt volume in Slovakia (in bill. EUR)



Source: NBS.

Figure 1.11: Interest rates by loan category (in %)

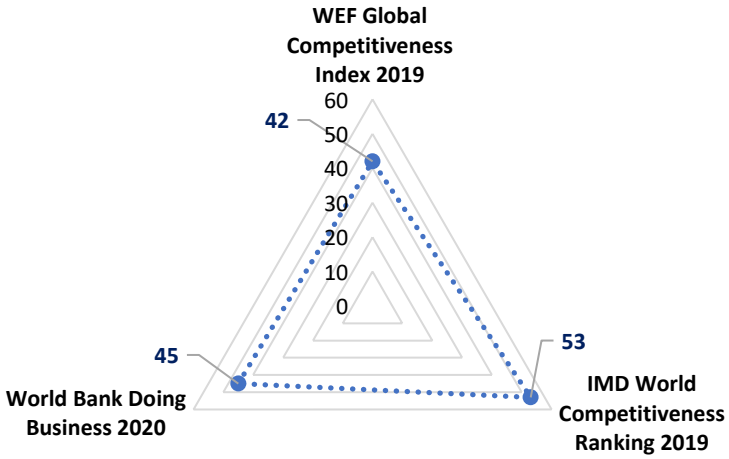


Source: NBS.

1.2 Competitiveness of Slovakia from an international perspective

There are various international rankings that score countries based on their competitiveness, of which perhaps the most prominent are *The Global Competitiveness Index* (GCI) of the World Economic Forum (WEF), *Doing Business* of the World Bank, and *The World Competitiveness Ranking* of the International Institute for Management Development (IMD). Because the methodologies applied in quantifying competitiveness differ from one index to another, this Report considers the standing of Slovakia across all three rankings. According to these institutions, Slovakia presently lies between the 42nd and 53rd rank in terms of international competitiveness (Figure 1.12).

Figure 1.12: Slovakia's position in international competitiveness rankings



Source: WEF, World Bank and IMD.

Global Competitiveness Index

The Global Competitiveness Index, deemed one of the most comprehensive country comparisons in the world, aims to provide a true picture of the growth potential of economies. It evaluates a country's potential to achieve sustainable economic growth over the medium term and ranks economies accordingly. In 2019, Slovakia scored 67 points, which places it at 42nd position out of 141 countries. Hence, Slovakia finds itself in the upper third of the countries considered (Table 1.7). Slovakia scored the highest in the pillar of macroeconomic stability, which considers inflation and debt dynamics. On the other hand, the worst result was achieved in the product market pillar, which examines the competitiveness of the domestic market and the openness of the economy to foreign trade. Regionally, we lag behind in our quality of infrastructure and in terms of market size. In comparison with neighboring countries, Slovakia is superior at adopting ICT, as the examination of mobile network connectivity, mobile and broadband internet connection, as well as the number of internet users shows.

Table 1.7: Ranking in the Global Competitiveness Index 2019 subcategories

		Slovakia	Czechia	Hungary	Poland	Austria
	Overall rank	**42**	**32**	**47**	**37**	**21**
Enabling environment	Institutions	61	44	63	60	14
	Infrastructure	30	20	27	25	10
	ICT adoption	39	42	54	51	50
	Macroeconomic stability	1	1	43	1	1
Human capital	Health	57	48	70	54	15
	Skills	45	29	49	34	16
Markets	Product markets	89	55	91	50	17
	Labor market	64	48	80	70	29
	Financial system	56	47	66	57	30
	Market size	59	42	48	22	43
Innovation ecosystem	Entrepreneurial dynamics	55	32	83	59	30
	Innovation capacity	44	29	41	39	14

Source: WEF (2019).
Note: The table indicates the ranking out of 141 countries, not the score. Hence, a higher number indicates worse performance by a country.

Doing Business

The World Bank annually issues its Doing Business ranking. Of the 190 countries considered in the 2020 issue, Slovakia scored 75.6 points and stood at 45th place—three ranks down from the previous year (Table 1.8). A positive development in the past years can be attributed to a reform that streamlined the complex paperwork surrounding tax arrears, thanks to which Slovakia's position in the category Starting a business jumped from 127th place in 2019 to 118th in 2020. Not much change took place in the category Dealing with construction permits, which explains the slight decline from 143rd to 146th place. Slovakia performed the best in terms of the Trading across borders category and the Registering property category, which takes an average of 16.5 days on compared to the OECD mean of 23.6 days.

Table 1.8: Ranking in the Doing Business 2020 subcategories

	Slovakia	Czechia	Hungary	Poland	Austria
Overall rank	**45**	**41**	**52**	**40**	**27**
Starting a business	118	134	87	128	127
Dealing with construction permits	146	157	108	39	49
Getting electricity	54	11	125	60	29
Registering property	8	32	29	92	31
Getting credit	48	48	37	37	94
Protecting minority investors	88	61	97	51	37
Paying taxes	55	53	56	77	44
Trading across borders	1	1	1	1	1
Enforcing contracts	46	103	25	55	10
Resolving insolvency	46	16	66	25	22

Source: World Bank (2020).
Note: The table indicates the ranking out of 190 countries, not the score. Hence, a higher number indicates worse performance by a country.

IMD World Competitiveness ranking

International Institute for Management Development (IMD) is a Swiss business school that has been publishing its World Competitiveness ranking of 63 countries—Slovakia being one of them— for over 30 years. As Table 1.9 shows, Slovakia seems to be gragually losing its edge over time. Slovakia now ranks 53rd out of the 63 economies, while in 2008, the year preceding the Great Recession, it ranked 30th. Furthermore, looking at individual subcategories within the scoring system, we can see that in terms of Economic performance, Slovakia lags behind the rest of the V4 at 42nd place, despite jumping 10 ranks from 2017. A weakness of Slovak economic performance is foreign investment, as well as employment. Aside from economic performance, IMD also considers government efficiency, business efficiency, and infrastructure. The disappointingly poor position of Slovakia within the Business efficiency category echoes many of the same issues the aforementioned Doing Business has touched upon (Table 1.10). In this respect, Slovakia ranks 60th out of 63, whereby its Labor market and Management practices are deemed the worst among all examined nations. Government efficiency entails the examination of business legislation, where again, Slovakia finds itself at the bottom of the chart at 59th position.

Table 1.9: Ranking in the IMD World Competitiveness 2019 subcategories

		Slovakia	Czechia	Hungary	Poland	Austria
	Overall rank	**53**	**33**	**47**	**38**	**19**
Economic performance	Domestic economy	39	29	23	26	19
	International trade	19	17	12	10	18
	International investment	56	38	63	40	25
	Employment	47	12	34	32	33
	Prices	23	25	14	9	24
Government efficiency	Public finance	47	25	45	38	30
	Tax policy	50	47	46	49	61
	Institutional framework	54	31	39	41	17
	Business legislation	59	42	37	39	21
	Societal framework	46	25	41	38	13
Business efficiency	Productivity and efficiency	34	28	46	27	13
	Labor market	62	49	59	38	19
	Finance	57	36	49	37	21
	Managerial practice	61	43	49	36	10
	Attitudes and values	59	39	57	48	34
Infrastructure	Basic infrastructure	46	24	32	31	15
	Technological infrastructure	42	30	41	39	26
	Scientific infrastructure	50	26	35	31	13
	Health and environment	38	31	39	43	9
	Education	47	40	44	31	13

Source: IMD (2019).
Note: The table indicates the ranking out of 63 countries, not the score. Hence, a higher number indicates worse performance by a country.

As the survey of global competitiveness rankings revealed, there are substantial gaps in competitiveness that Slovakia must address going forward, not limited to infrastructure quality, institutional quality, and the legislative framework—topics that will be covered in greater depth in the following chapters. Moreover, international comparisons show that the Slovak business environment proves problematic, substantially falling behind in terms of market size, employment, managerial competence and business legislation.

Table 1.10: Ranking in the IMD index across time

		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
World competitiveness ranking	Slovakia	41	38	38	33	34	33	34	30	33	49	48	47	47	45	46	40	51	55	53
	Czechia	35	32	31	36	30	28	32	28	29	29	30	33	35	33	29	27	28	29	33
	Hungary	30	30	30	35	31	35	35	38	45	42	47	45	50	48	48	46	52	47	47
	Poland	47	45	47	48	48	50	52	44	44	32	34	34	33	36	33	33	38	34	38
	Austria	14	15	14	13	17	13	11	14	16	14	18	21	23	22	26	24	25	18	19
Economic performance	Slovakia	48	43	38	38	47	47	42	32	34	54	57	55	52	55	54	44	52	46	42
	Czechia	25	27	25	26	32	23	29	20	25	29	34	29	38	30	26	20	19	16	17
	Hungary	31	33	31	39	43	37	38	39	33	40	44	35	44	32	17	26	36	39	46
	Poland	47	46	48	48	46	46	41	31	39	24	31	30	36	36	33	27	27	18	18
	Austria	21	21	14	20	25	27	21	17	18	18	24	20	22	17	21	19	40	17	20

Source: IMD.
Note: The table indicates the ranking out of 63 countries, not the score. Hence, a higher number indicates worse performance by a country.

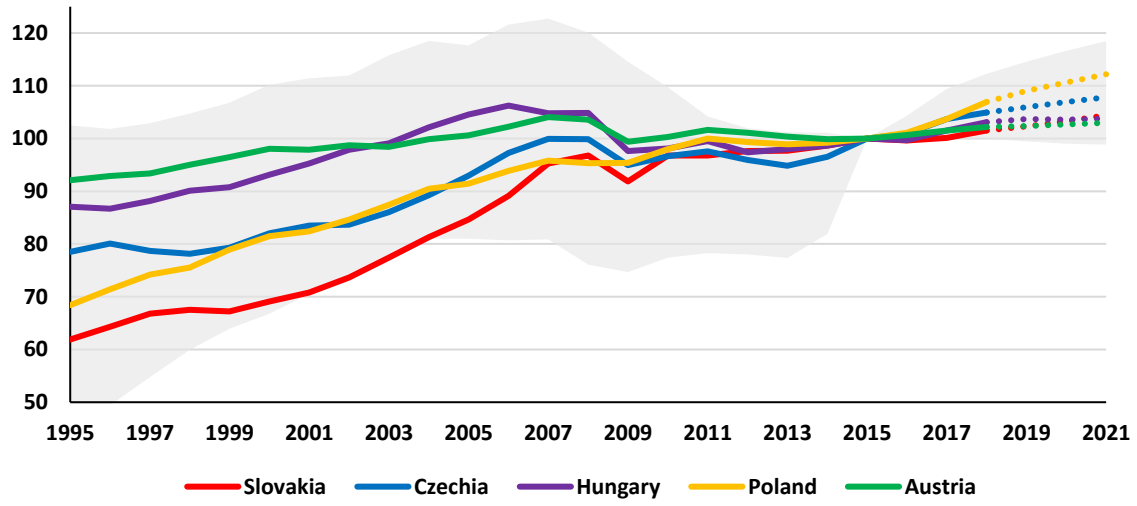
2 Productivity of factors of production

Labor productivity and economic growth are key determinants of maintaining national competitiveness in the global marketplace (Auzina-Emsina, 2014). Productivity is measured as the ratio of total output to inputs used in the production of goods and services. Productivity grows when output, i.e. production, grows at a higher rate than inputs do. An improvement in productivity at the firm level directly translates to national economic growth. When discussing productivity, it is important to distinguish between labor productivity, capital productivity and total factor productivity (TFP).

Labor productivity captures growth in value added of production per utilized unit of labor. There are three determinants of labor productivity—human capital, technology, and economies of scale (Taylor et al., 2016). Capital productivity, on the other hand, is a measure of the efficiency of the transformation of inputs (in the form of physical capital) into output. Finally, TFP is a productivity measure involving all factors of production. It measures output per unit of factor of production used as an input in the production process. TFP growth captures the growth in output that cannot be attributed to growth in labor or capital, so that the TFP growth rate can be used as a proxy for the rate of technological progress.

TFP in Slovakia has grown from 69% of the 2015 level in 2000 to 96.8% in 2008. The Great Recession subsequently caused a slump in TFP, after which TFP growth slowed down (Figure 2.1). The slowdown in labor productivity growth and the TFP growth again support the claim that Slovakia‘s ability to converge to the EU-28 average is presently under threat.

Figure 2.1: Development of total factor productivity



Source: AMECO.
Note: The base year of the index is 2015. The gray band captures the range of values recorded in the EU as a whole. Dotted lines represent forecast values.

Differences in GDP per capita between Central and Eastern Europan countries and those of the EU-15 primarily stem from differences in labor productivity (Grela et al., 2017). Furthermore, the contribution

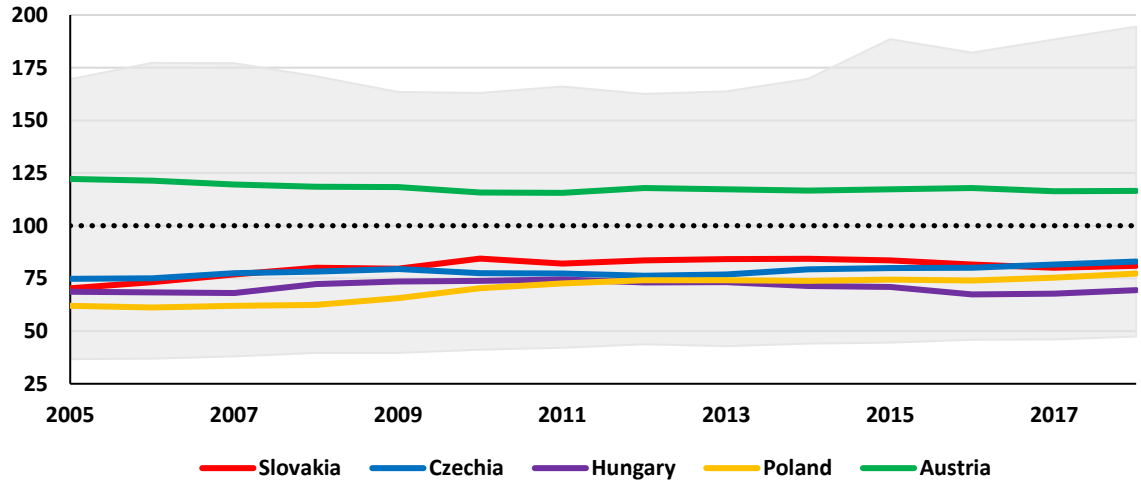
of TFP to economic growth in Central and Eastern European countries proves significantly higher compared to the other parts of the world, which may to some extent be explained by the legacy of an ineffective system of central planning, followed by the reallocation of resources to more productive sectors of the economy.

2.1 Labor productivity and costs per unit of labor

Labor productivity is a fundamental gauge of productivity. Figures 2.2 and 2.3 depict nominal labor productivity, whereby it is indexed in a way so that the EU-28 average in the given year is assigned a value of 100. The index of nominal labor productivity per employee is calculated as GDP per employee, expressed in euros and adjusted for purchasing power parity in order to eliminate price differences between individual countries (Figure 2.2). Labor productivity per hour worked is calculated as the real output per unit of labor (measured by total hours worked, Figure 2.3). This measure gives a more accurate account of the development in productivity per employed person, as it eliminates the differences that exist between individual years and countries in the composition of the labor force such as full-time and part-time work or work overtime.

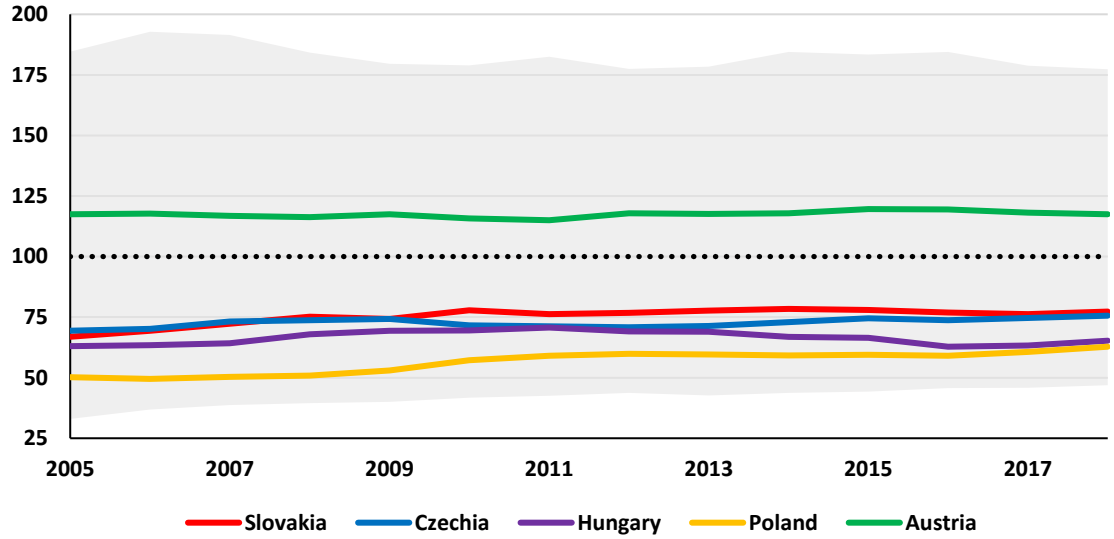
The year period between 2005 and 2010 saw rapid convergence of Slovak nominal labor productivity to the EU average in terms of both indicators. However, stagnation followed. Today, the nominal labor productivity in Slovakia stands at 80.9% of the EU average in terms of labor productivity per hour worked (Figure 2.3); if we look at labor productivity per employee, it is at 80.2% of the EU average (Figure 2.2). What proves problematic, however, is that the productivity gap between Slovakia and the EU has not been narrowing further in recent years. Comparing the development of nominal labor productivity and GDP per capita in PPP terms, we can see that Slovakia reports higher labor productivity per employee (aside from Czechia, which overtook Slovakia in 2017) and per hour worked than the rest of the V4, but this does not seem to translate into higher GDP per capita in current prices (Figure 2.4). The primary cause is likely the lower labor force participation rate in Slovakia, especially among marginalized communities and pensioners.

Figure 2.2: Nominal labor productivity per employee in PPP



Source: Eurostat.
Note: The unit is an index, where the base is the EU-28 average in the given year= 100. The gray band captures the range of values recorded in the EU as a whole.

Figure 2.3: Nominal labor productivity per hour worked in PPP



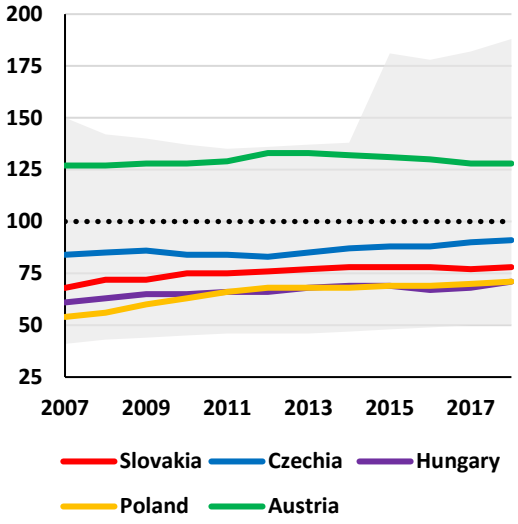
Source: Eurostat.
Note: The unit is an index, where the base is the EU-28 average in the given year= 100. The gray band captures the range of values recorded in the EU as a whole.

Exacerbating the problem further, labor costs show an upward trend despite stagnant labor productivity. Labor costs per hour worked are defined as wage expenditure (the sum of gross wages and contributions) divided by the number of hours worked. In this regard, Slovakia stood at 67% of the EU-28 average in 2018 after the conversion of prices to PPP (Figure 2.5), whereby labor productivity per hour worked was at 77%. If we do not adjust the values for PPP, the number would be 46.4% of the EU-28 average in 2018. If we compare the development of labor productivity per hour worked and labor costs, it becomes apparent that the times when the Slovak economy enjoyed a cost advantage in terms labor seem to be coming to a close.

The combination of stagnant labor productivity and increasing labor costs undermine the competitiveness of a nation. It must be noted, however, that unit labor costs have been growing at a relatively fast pace across all V4 countries since 2015 (Figure 2.6). According to the forecast values, nominal unit labor costs will be 23 percentage points higher in 2021 than they were in 2015. Meanwhile, the nominal unit labor costs in the EU-28 will see an 11 percentage-point increase. Žúdel (2020) forecasts a slowdown in the economy in 2020, which will bring about a slowdown in the growth of wages, bringing labor productivity growth and wage growth more in line.

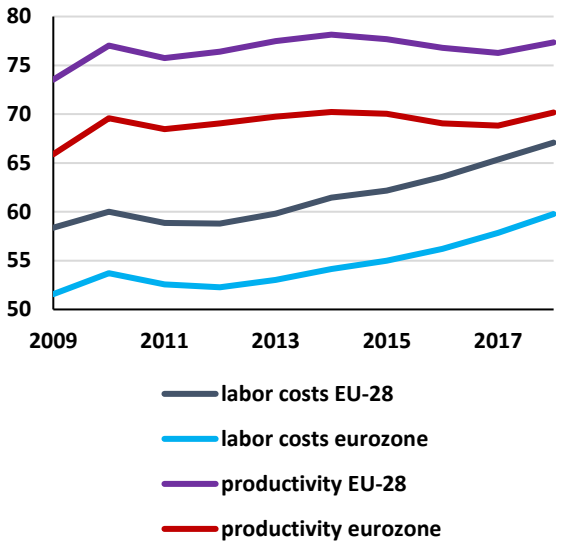
Unit labour costs are a key measure for the purpose of international comparison. In 2009, they stood at 11.5 euros per hour in PPP, while the EU-28 level was 19.7 euros. In 2018, this value was 11 euros (comparable to Czechia), or 15.9 euros in PPP (Figure 2.7). Naturally, labor costs in Austria are significantly higher, as is the labor productivity.

Figure 2.4: GDP per capita in PPP (in % of EU-28 average, in current prices)



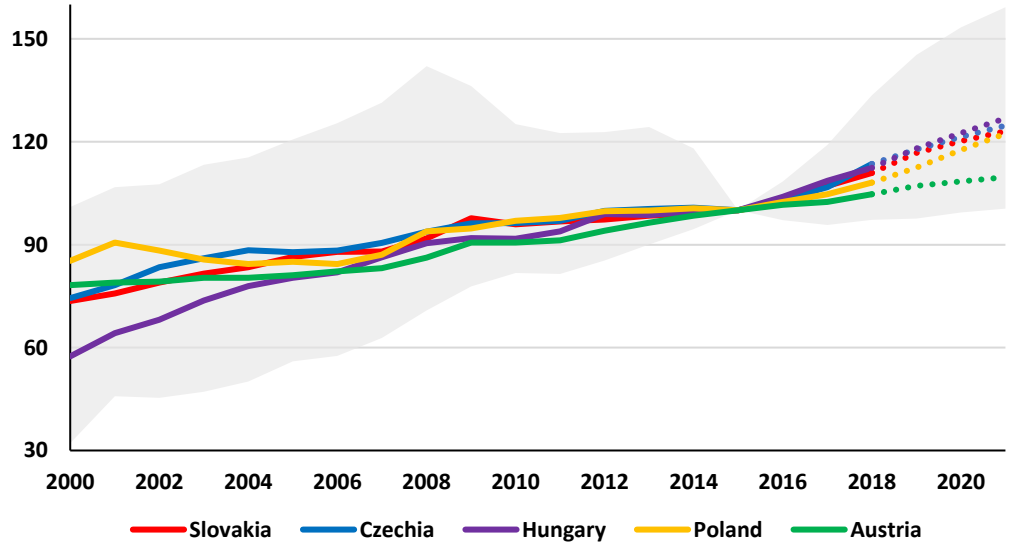
Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The dotted line represents EU average. The EU range omits Luxembourg for extreme values.[9]

Figure 2.5: Labor expenses and labor productivity per hour worked in Slovakia (in % of EU-28 and eurozone average)



Source: Eurostat.
Note: Labor costs per employee are calculated per hour worked, in euros and PPP terms. Labor productivity is calculated per hour worked.

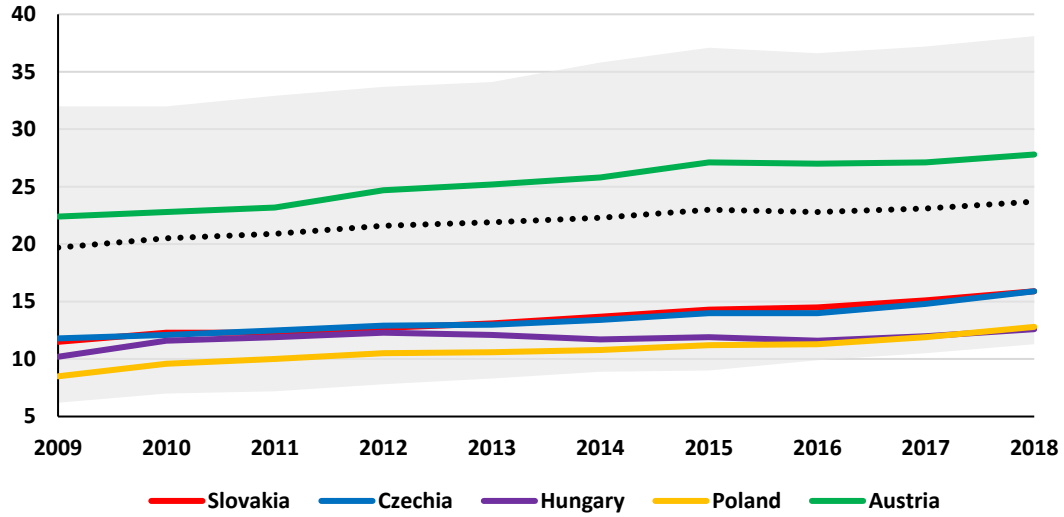
Figure 2.6: Nominal unit labor costs



Source: AMECO.
Note: The gray band captures the range of values recorded in the EU as a whole. The index measures the ratio of labor costs to real GDP per employed person expressed in national currency, whereby the average rate of growth in individual countries is weighted by current values in euros, benchmarked against the year 2015 (2015=100).

[9] The rapid increase in the maximum value between 2014 and 2015 is, according to the OECD, caused by the movement of economic activity and intellectual property of multinational corporations to Ireland. Revenues arising from intellectual property began to be accounted towards the Irish GDP, causing a year-on-year jump of approximately 38% in GDP per capita.

Figure 2.7: Labor costs per hour worked (in euros, PPP)

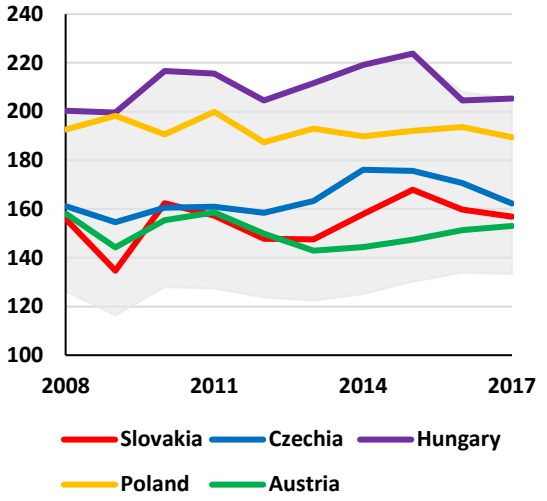


Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The dotted line represents the EU average.

2.2 Labor productivity in selected sectors of the economy

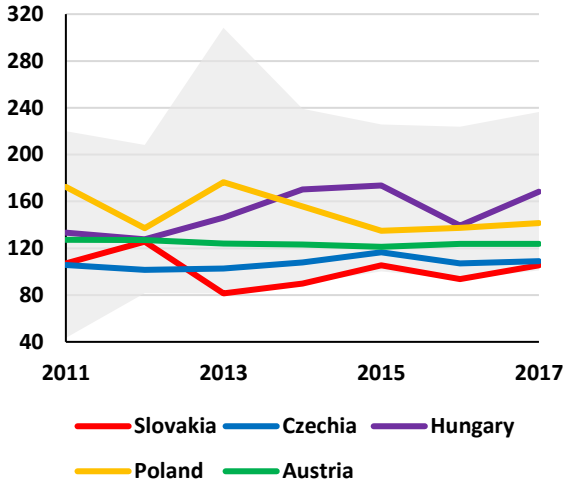
If we are to compare labor productivity and labor costs across different countries, it is also appropriate to look at labor productivity adjusted for employee wages. This measure captures the ratio of labor productivity to wage expenditure. As Figure 2.8 shows, labor productivity in manufacturing has been stagnant since the pre-crisis year of 2008. It can also be seen that the labor productivity adjusted for labor costs within the construction sector is significantly lower than that in the manufacturing sector (Figure 2.9) — this implies that the productivity growth experienced during the transition period has not spread into the non-tradable sectors such as construction. Slovakia recorded a sharp fall in labor productivity by 2013 to 81.4% and only regained the 2011 level (106%) in 2017. This downfall may be attributable to the inefficient allocation of factors of production within the construction sector, as argued by Peciar and Wittemann (2019). Conversely, as OECD (2019d) points out, the Slovak automotive industry has experienced non-negligible labor productivity growth, not least due to the presence of highly productive and export-oriented multinational firms. Hence, the participation of Slovakia in global value chains is an important driving force of allocative efficiency within the sector. The Slovak information and communication technology sector has been, prior to the Great Recession, one characterized by high value added relative to wages per employee (Figure 2.10). However, as can be seen in Table 2.1, value added has remained largely unchanged since the recession.

Figure 2.8: Wage-adjusted labor productivity: Manufacturing (in %)



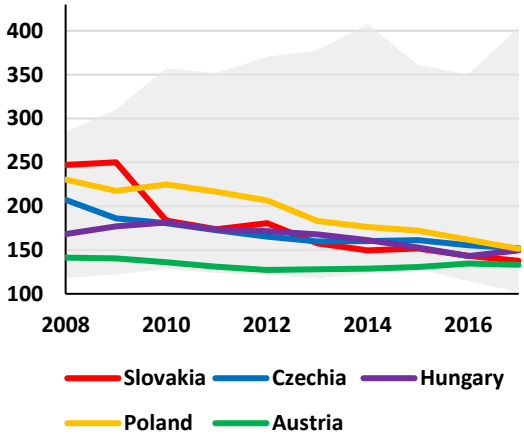
Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. EU range does not include Ireland for extreme values and Malta for data unavailability.

Figure 2.9: Wage-adjusted labor productivity: Construction (in %)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. EU range does not include values for Malta in the year 2016.

Figure 2.10: Wage-adjusted labor productivity: Information and communication technologies (in %)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. EU range includes incomplete data for Malta and France.

The slowdown in the growth of wage adjusted for labor productivity is not a matter to be taken lightly. Among the V4 economies, Slovakia, together with Czechia, has the highest labor costs and their growth rate exceeds that of the EU-28 average. Meanwhile, labor productivity growth is not keeping up with this pace.

Value added in sectors

Value added quantifies the value of goods and services produced in an economy, calculated as the value of output minus the value of intermediate inputs. Value added by economic activity presented below breaks this measure down by various sectors of the economy. For a small and open economy such as Slovakia, this indicator is especially meaningful, since it reflects the extent to which individual sectors within the production process contribute to the value of the final output. The indicator presented in Table 2.1 shows value added expressed as a percentage of total value added, broken down to sectoral level.

The service sector is one with the highest value added in Slovakia, claiming 63.78% of the value added in 2018. Figures 2.11 – 2.14 capture the evolution of value added within individual sectors from 1995 to present for V4 economies and Austria. Here, a structural shift of value added from manufacturing to construction and service sectors can be observed for Slovakia. Noteworthy is also the fact that the share of value added in Slovakia is significantly more volatile compared to neighboring economies, especially in industry, energy and construction sectors. This may be a sign of vulnerability of the Slovak economy to external shocks and swings caused by business cycles.

Table 2.1: Value added by activity (in % of total value added, 2018)

Services (%), of which:	**63.78**
Wholesale, retail, repairs, transport, accommodation and food services	19.49
Public administration, defense, education, health care and social work	14.44
Professional, scientific and support services	10.15
Information and communication technologies	4.7
Finance and insurance	3.12
Other services (art, recreation)	2.06
Real estate	9.82
Industry including energy (%), of which:	**25.67**
Manufacturing	21.93
Construction	**7.92**
Agriculture, forestry and fishing (%)	**2.63**

Source: OECD.

Figure 2.11: Value added - Services (in %)

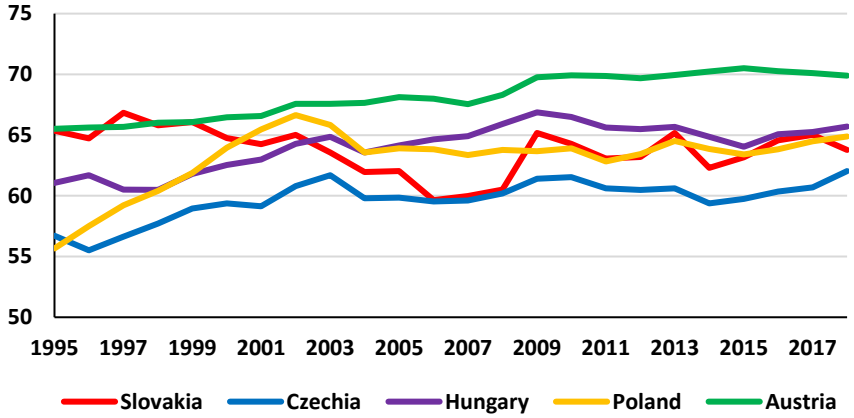


Figure 2.12: Value added – Industry and energy (in %)

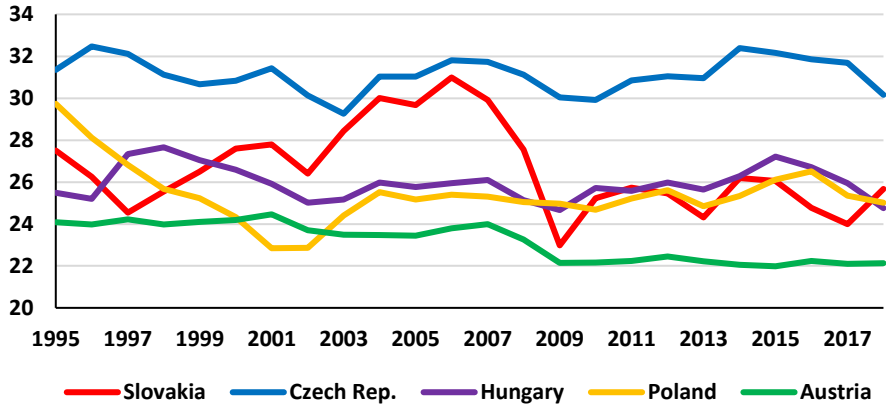


Figure 2.13: Value added - Construction (in %)

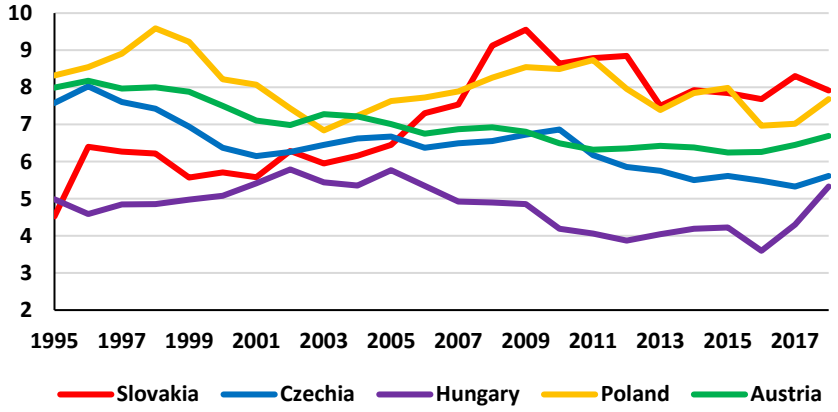
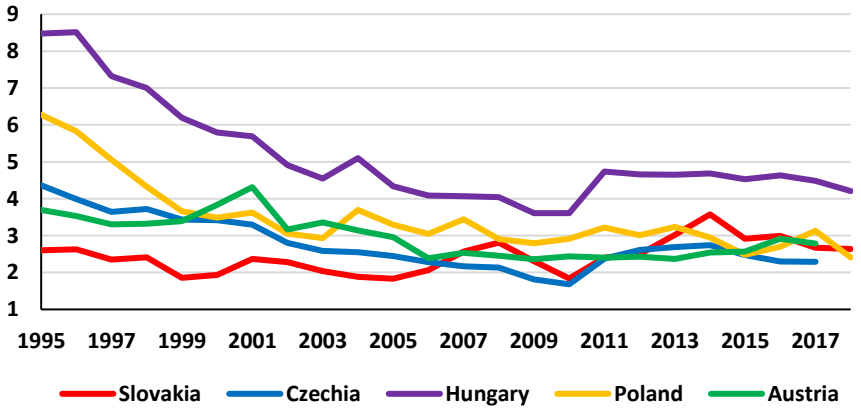


Figure 2.14: Value added - Agriculture, forestry and fishing (in %)



Source: OECD (all graphs).

3 Investment, infrastructure and energy

The volume of investment in an economy is an important determinant of productivity that should not be overlooked. Academic literature repeatedly points to the strong relationship between the level of public as well as private investment in physical capital or infrastructure and output per worker (e.g. Aschauer, 1989; Munnel, 1990; Lichtenberg, 1992). Korkmaz and Korkmaz (2017) and Jorgenson, Gollop and Fraumeni (1987) even identify capital as the single most important factor of production for economic growth, and Jajri and Ismail (2010) emphasize the necessity of investing in capital for achieving productivity growth, as well as economic growth overall. Investment in research and development, as well as in other intangible assets, is also of vital importance, as these sectors often are the key catalysts of technological progress and TFP growth. In this context, the declining trend in gross fixed capital formation in the post-crisis period, lack of investment in intangibles stimulating innovation, the stagnant state of foreign direct investment stocks, as well as the inferior quality of public infrastructure present significant obstacles for achieving further growth in productivity and competitiveness.

3.1 Gross fixed capital formation

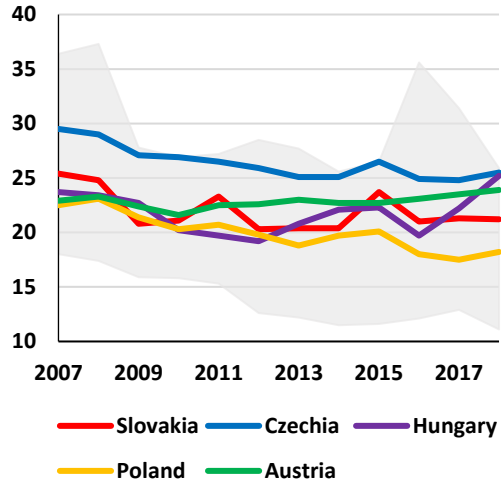
Investment in tangible and intangible assets leads to the accumulation of capital in an economy, enabling a structural transition towards more capital-intensive sectors. At the same time, it is investment that allows the modernization of production processes or the upgrading of machinery, in turn boosting output per worker. A gradual decline recorded in the level of gross fixed capital formation in the EU following the Great Recession (Figure 3.1) thus presents a worrying trend in terms of European labor productivity, in which Slovakia, despite some swings, is no exception.

At the same time, it must be noted that it is not only the quantity of investment that matters for productivity and competitiveness, but also the quality. Decomposing the gross fixed capital formation values based on asset types (Figure 3.1), it can be seen that the majority of investment capacity is taken up by construction and acquisition of new machinery and equipment. On the other hand, the share of ICT or intellectual property remain at very low levels, especially in comparison with Czechia and Austria. These modern sectors stimulate innovation and technological progress and have a significant potential to contribute towards TFP growth.

Furthermore, it may be seen that Slovakia is characterized by a relatively low share of public sector investment in terms of gross fixed capital formation (Table 3.1). This may, to some extent, be related to the fairly limited capacity to collect taxes. Inflow from taxes and social contributions at the national level fluctuates between 30 and 40% of GDP, as Figure 3.2 depicts. With the gradual decline in tax revenues to GDP witnessed between 1995 and 2005, the Slovak value has hit the EU minimum in 2006, but has now recovered to a level comparable to that of neighboring countries. However, Bukovina and Palkovičová (2020) forecast a slowdown in the growth rate of tax and social contribution revenue in 2020 to 3.2% from the 6.1% recorded in the previous year. Relatively low government revenue may be limiting the capacity of public investment and can indicate an institutional weakness in the tax collection process. The low government revenue could largely be offset by tapping into EU finances.

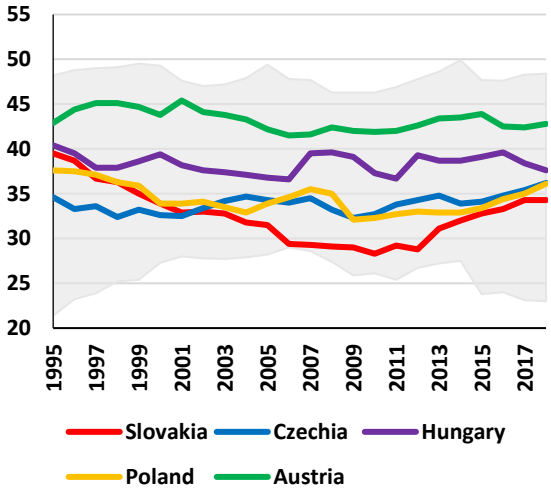
As will be shown in Section 3.4, however, Slovakia also lags behind in its ability to utilize European Structural and Investment Funds.

Figure 3.1: Gross fixed capital formation (in % GDP)



Source: Eurostat.
Note: Gross fixed capital formation quantifies the investment of the public sector, the private sector and of households in fixed assets. Fixed assets consist of dwellings, other structures, machinery, equipment and intangibles such as intellectual property or software. The gray band captures the range of values recorded in the EU as a whole.

Figure 3.2: Government tax and social contribution revenue (in % GDP)



Source: Eurostat.
Note: Government tax and social contribution revenue consists of all tax and contribution payments after subtracting such claims that are unlikely to be collected. The gray band captures the range of values recorded in the EU as a whole.

Table 3.1: Gross fixed capital formation- breakdown by asset type and sector (in % GDP, 2018)

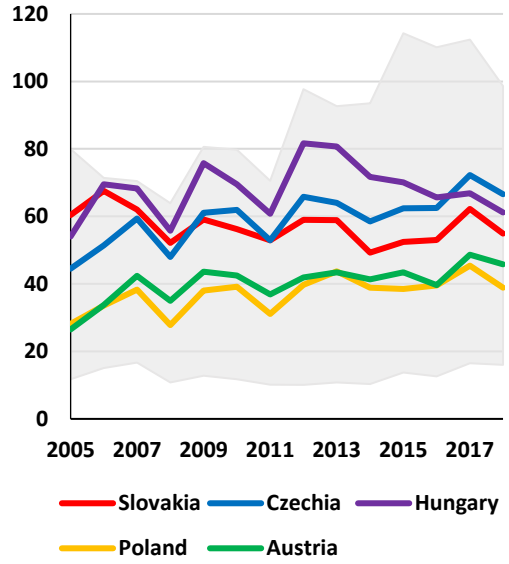
		SK	CZ	HU	PL	AT
Gross fixed capital formation by asset type (% GDP)	Construction	9.5	10.2	12.5	9.2	10.9
	Transport equipment	2.7	2.8	2.6	2	2.3
	ICT equipment	0.4	1.6	0.7	-	1.2
	Other machinery, equipment and weapons	6.3	6.8	6.4	5.6	4.6
	Intellectual property products	1.8	4.1	2.8	1.4	5
Gross fixed capital formation by sector (% GDP)	Households	4.44	4.6	4.16	4.17*	5.26
	Public sector	3.74	4.1	5.84	3.78*	2.98
	Private sector	13.05	16.79	15.18	9.76*	15.71

Source: Eurostat.
*2017 data.

3.2 Foreign direct investment

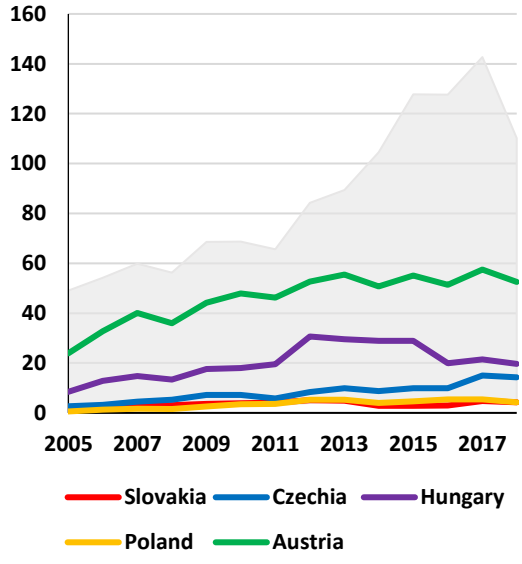
Investments coming in from abroad are at least as important as those raised domestically. Foreign direct investment (FDI) can be a significant source of economic growth, as it not only brings employment, but also foreign technology, production processes, managerial expertise and know-how. Furthermore, via strengthened competition and spill-over effects, FDI also boosts the productivity and competitiveness of domestic firms. Indeed, Grela et al. (2017) confirm that the large volume of foreign capital inflows coming into Central and Eastern European countries was likely the most important determinant of convergence towards high-income countries. Likewise, Bijsterbosch and Kolasa (2009) point to the strong effect FDI has had on productivity convergence in these countries. Moreover, Peciar and Wittemann (2019) claim firms with foreign ownership in Slovakia exceed the productivity of Slovak-owned firms by over one-half. The increased tax revenue arising from FDI is also non-negligible, expanding the capacity of public investment. It is important to note, however, that it is not sufficient to stimulate foreign investment in an economy just for the sake of quantity. Strategic sectors with high value added must be identified and regulatory barriers that hinder technological transfers to domestic firms removed.

Figure 3.3: Inward FDI stocks (in % GDP)



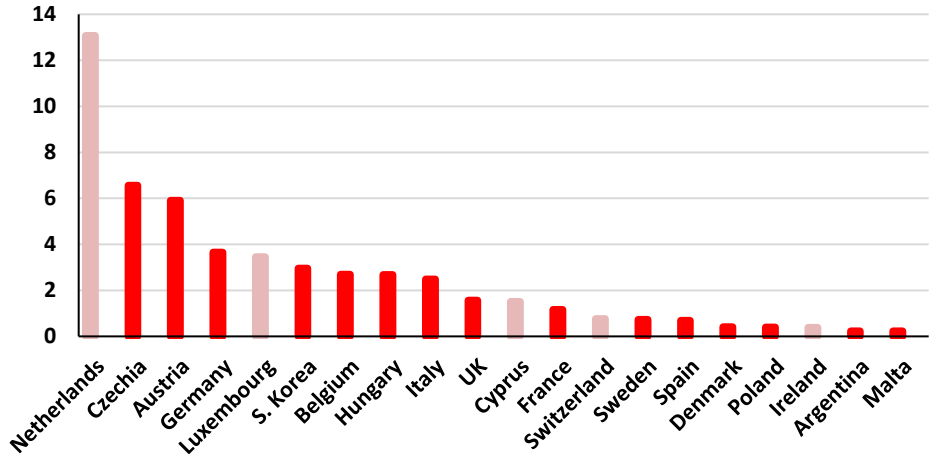
Source: OECD.
Note: The gray band captures the range of values recorded in EU countries that are simultaneously members of the OECD. International financial centers (Ireland, the Netherlands and Luxembourg) are omitted from the range due to extreme values.

Figure 3.4: Outward FDI stocks (in % GDP)



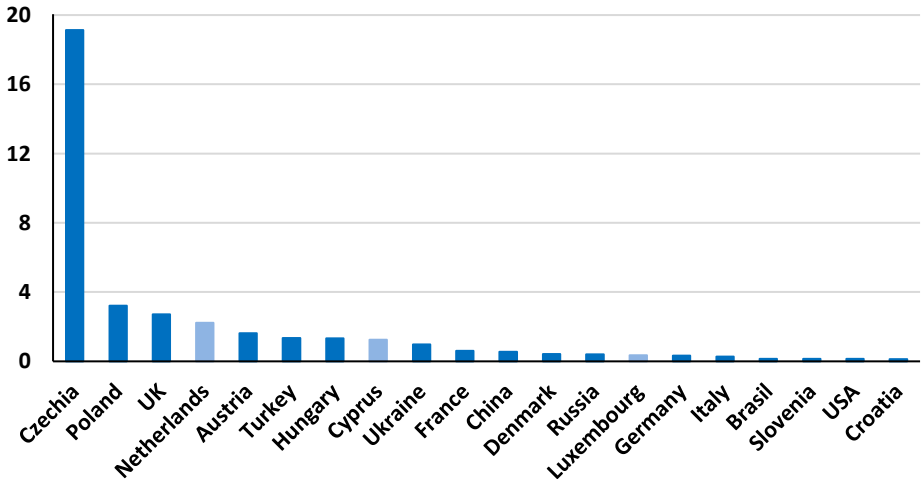
Source: OECD.
Note: The gray band captures the range of values recorded in EU countries that are simultaneously members of the OECD. International financial centers (Ireland, the Netherlands and Luxembourg) are omitted from the range due to extreme values.

Figure 3.5: Inward FDI stocks in Slovakia by country (2018, in mil. EUR)



Source: NBS.
Note: Countries marked in lighter color are prominent international financial centers and hence capital coming in from these countries may not necessarily have originated here.

Figure 3.6: Outward FDI stocks in Slovakia by country (2018, in hundred thous. EUR)



Source: NBS.
Note: Countries marked in lighter color are prominent international financial centers and hence capital going into these countries may not necessarily have the given country as its final destination.

FDI stocks quantify the accumulated value of foreign capital, while FDI flows capture the flow of capital in a given period of time. Ramirez (2006) notes that in the context of productivity, it is more appropriate to look at the cumulative stock of capital rather than flows, as it is the former rather than the latter that affects marginal labor productivity. Slovak inward FDI stocks stood at 70% of GDP in 2006, but as a result of a global slowdown in investment activity that followed in subsequent years, the value has sunk to 54.9% of GDP (Figure 3.3). Most investors in Slovakia come from the EU, with neighboring countries making up a large portion of FDI in Slovakia (Figure 3.5). At the same time, we can see that while in 2006, Slovakia had one of the highest inward FDI stock to GDP ratios within the EU, today the value is barely above the EU median.

In contrast to stocks of inward FDI, stocks of outward FDI in Slovakia are miniscule in relation to GDP. This reflects the fact that Slovakia currently finds itself at a specific phase of development: it is a fast growing medium-income economy, and its capital importing needs outweigh the need for capital

exports. In this sense, Slovakia is not much different from the other V4 economies, despite being at the bottom of the range of EU countries that are also OECD members in terms of the outward FDI stock to GDP ratio (Figure 3.4). Within the rather limited foreign investment activity undertaken by Slovak firms, the lion's share goes to Czechia (Figure 3.6). Hence, outward FDI in Slovakia is extremely regionally oriented and motivated primarily by the expansion to characteristically similar economies. This reality constrains the potentially favorable economic effects that outward FDI can bring, limiting the acquisition of new technology and know-how from abroad.

At the same time, the ability to attract foreign investors is related to the competitiveness of a given economy. Investors evaluate the suitability of a country based on various factors, such as labor costs, macroeconomic stability, the tax system, infrastructure quality, or institutional quality (OECD, 2008). The stagnation witnessed in inward FDI stocks may thus potentially be a warning sign of deteriorating competitiveness of the Slovak business environment, echoing the low ranking in the aforementioned World Bank's Doing Business 2020 indicators.

Tax policy

Tax policy is an important determinant of FDI. In its survey of various empirical studies, OECD (2008) shows that the volume of FDI flows is negatively related to the level of taxes—namely, 1 percentage point increase in the tax rate is associated with an average 3.7% decrease in FDI flows. In this context, it becomes relevant to look at the effective corporate tax rate, which measures the average tax rate at which firm revenues are taxed. The effective tax rate may differ from what is given by legislation due to various exemptions. As Table 3.2 shows, Slovakia is the only country in the region that has seen a notable increase in its effective tax rate between 2007 and 2018, while Czechia and Hungary have recorded a drop. As a result, Slovakia now has the highest effective corporate tax rate in the region after Austria. While this may be positive news in terms of addressing low government tax revenues, it may also be harmful for attracting further FDI.

Table 3.2: Average effective corporate tax rate for non-financial organizations (in %)

	2007	2018	Rank
Slovakia	16.8	18.7	16
Czechia	21	16.7	19
Hungary	19.5	11.1	27
Poland	17.4	17.5	17
Austria	23	23.1	8

Source: Eurostat.
Note: The effective tax rate at the firm level is calculated as the ratio of total tax expenses to earnings before tax.

3.3 Infrastructure

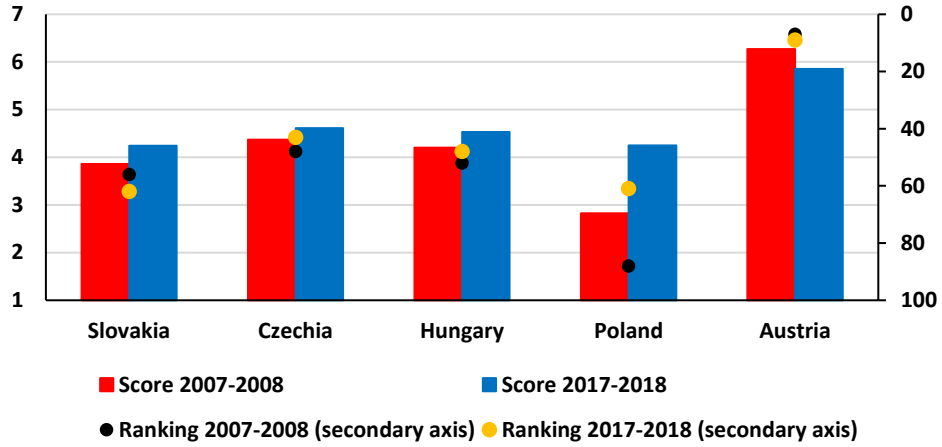
The quality of infrastructure is a vital determinant of productivity and competitiveness. Insufficient investment in the maintenance and upgrading of public infrastructure can lead to economic stagnation. Aschauer (1989) showed that a decline in public infrastructure investment was one of the key explanatory forces of the TFP growth slowdown in the US in the 1970's. Building on Aschauer's study, Ford and Poret (1989) identified a significant effect of infrastructure on TFP in about half of the countries examined. Likewise, Grela et al. (2017) found infrastructure investment, primarily into ICT, to be one of the most important driving forces behind productivity growth and convergence of Central and Eastern European countries. The linkage between infrastructure and productivity should not be surprising: improvements in the infrastructure reduces the time required to transport products, stimulates international trade and enables the concentration of production that brings about economies of scale (Crafts, 2009). Likewise, the upgrading of ICT makes business communication easier and allows firms to access important information for decision-making in a timely manner.

Transport infrastructure and logistics

A well-developed system of transport infrastructure is key from the point of view of international competitiveness, as well as for attracting FDI. As was discussed earlier, WEF evaluates various aspects of competitiveness in its Global Competitiveness Indicators, in which infrastructure makes up one of the 12 socioeconomic pillars. Based on this indicator, Slovakia's state of infrastructure improved in the 10-year period between 2007/08 and 2017/18 from 3.86 to 4.24 (7 being the maximum score). However, improvements in other countries exceeded the progress in Slovakia, and our position in the ranking actually dropped as Figure 3.7 shows. Moreover, Slovakia is the only country within the V4 that saw its standing deteriorate in the 10-year period. A similarly bleak picture of Slovak infrastructure is painted by the Logistics Performance Index (LPI) of the World Bank, which assesses the efficiency and ease at which products can be transported to and within a country. As can be seen in Table 3.3, Slovakia significantly lags behind neighboring countries, which are tens of ranks ahead in the ranking. The specific areas within the LPI that call for greater attention are timeliness of delivery and tracking ability. The uncompetitive state of Slovak infrastructure suggests insufficient investment in this direction.

An alternative measure of road quality may also be the speed at which automobiles can travel between the two biggest cities of a country. Table 3.4 summarizes this information. While the minimum travel estimated speed between city A and city B in Slovakia is above the neighboring country avergage, the maximum speed (that is, ideal traffic conditions) in Slovakia is below average. The only case in which the maximum travel speed in Slovakia does not come in last is when afternoon travel is considered, due to the volatility of traffic conditions in Poland. In combination with the fact that Bratislava and Košice lie the furthest apart in terms of distance, making the Slovak market more geographically dispersed, it can be concluded that the road conditions in Slovakia fall behind those of neighboring countries.

Figure 3.7: Global Competitiveness Indicators – infrastructure quality



Source: World Economic Forum.
Note: The score is on a scale of 1 to 7, whereby 7 is the best score, or the most competitive economy in this respect.

Table 3.3: Logistics Performance Index (2018)

		LPI overall	Customs performance	Infrastructure quality	Timeliness	International transport	Quality of logistics services	Tracking and tracing
SK	Score	3.03	2.79	3	3.14	3.1	3.14	2.99
	Ranking	53	50	48	86	52	41	64
CZ	Score	3.68	3.29	3.46	4.13	3.75	3.72	3.7
	Ranking	22	30	26	16	10	20	24
HU	Score	3.42	3.35	3.27	3.79	3.22	3.21	3.67
	Ranking	31	27	30	32	43	38	26
PL	Score	3.54	3.25	3.21	3.95	3.68	3.58	3.51
	Ranking	28	33	35	23	12	29	31
AT	Score	4.03	3.71	4.18	4.25	3.88	4.08	4.09
	Ranking	4	12	5	12	3	6	7

Source: World Bank.
Note: The final score is calculated as the arithmetic average of the six dimensions.

Table 3.4: Road transport between two largest cities in a country

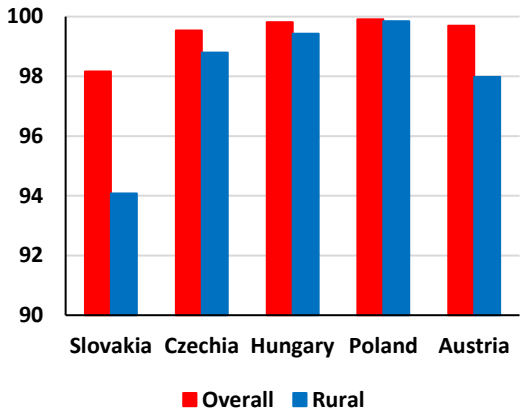
			Average speed (km/h)			
	Distance (km)	Duration	Departure at 2 AM		Departure at 2 PM	
			Min	Max	Min	Max
Slovakia	404	4:10 – 5:20	80.80	89.78	75.75	96.96
Czechia	205	1:50 – 2:40	76.88	102.50	76.88	111.82
Hungary	233	2:10 – 3:20	82.24	107.54	69.90	107.54
Poland	294	3:10 – 4:50	60.83	92.84	60.83	92.84
Austria	200	2:00 – 3:00	75.00	100.00	66.67	100.00

Source: Google Maps.
Note: The values are calculated based on the optimal route for automobile transport between the two largest cities in the country by population (i.e. Bratislava and Košice in Slovakia, Prague and Brno in Czechia, Budapest and Debrecen in Hungary, Warsaw and Krakow in Poland, and Vienna and Graz in Austria), departing on Feb 17, 2020 at 2 AM and 2 PM. The estimated journey duration, which Google Maps discloses as a range, is subsequently divided by the distance to obtain an estimate of average speed.

Network infrastructure

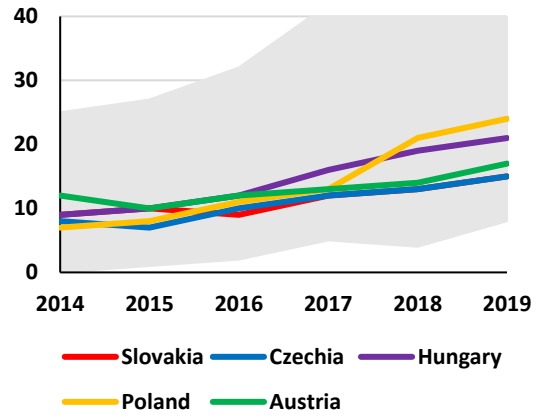
Technological progress over the past century has made investment in network infrastructure at least as crucial as that in transport infrastructure. In order for an economy to transition into highly productive intelligent manufacturing or "Industry 4.0", a fast and reliable network connection is a vital prerequisite. Broadband coverage in Slovakia currently reaches 98.2% of households, as Figure 3.8 depicts. Despite this relatively high share, Slovakia is nonetheless a country with the least broadband coverage among neighboring countries. Rural areas prove especially problematic—here the difference with other countries in the region is more significant. The difference between rural and urban broadband coverage does not only contribute to differences in the quality of life, but also affects the business environment in both of these areas. Modernization of rural areas thus ought to be a part of the agenda in raising competitiveness of the country and lowering the prevailing socioeconomic inequalities between urban and rural life in Slovakia.

Figure 3.8: Broadband coverage (in % of households)



Source: Eurostat.

Figure 3.9: Share of firms using the fastest available broadband connection 100Mb/s+ (in % of enterprises)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The maximum value in 2019 was 62%.

Looking at the private sector, we can see that only 15% of Slovak firms make use of the fastest available internet connection, i.e. 100 Mb/s and faster, while the maximum value for the EU was 62% (Figure 3.9). Hence, Slovakia is significantly below the EU-28 average in this measure, which stood at 22 % in 2019. In the context of big data use, which holds great potential for raising firm-level productivity going forward, it is noteworthy that while this area has been growing in the eurozone, it seems to be shrinking in Slovakia in terms of the share of firms that use big data in their operations (Table 3.4). Given the very limited number of available observations, however, we cannot make any confident claims about such trends. Rather, taking the average of 2016 and 2018 values for individual V4 countries and Austria, Slovakia seems to be the largest big data user in the region. Cloud computing is also a growth area in Slovakia, keeping pace with the euro area. Compared to countries such as Denmark, Sweden or Finland, however, where the share of firms using cloud computing services ranges from 55 % to 65 %, Slovakia is still substantially behind. The quality of digital infrastructure and

the innovative capacity of a country is also evaluated by the composite DESI index, which will be discussed in the next chapter (Table 4.2)

Table 3.5: Big data and cloud computing use by firms

		2016	2018
Firms analyzing big data (% of enterprises)	Slovakia	11	9
	Czechia	9	8
	Hungary	7	6
	Poland	6	8
	Austria	-	6
	EA	9	13
Firms buying cloud computing services over the internet (% of enterprises)	Slovakia	18	21
	Czechia	18	26
	Hungary	12	18
	Poland	8	11
	Austria	17	23
	EA	20	25

Source: Eurostat.

3.4 European structural and investment funds

Slovakia is one of the EU member states that have benefited greatly from the European Cohesion Policy and the financial transfers of the European structural and investment funds (ESIF). In the programming period of 2014-2020, 13.78 billion euros of EU funds were allocated to Slovakia[10], with the direct or indirect objective of boosting national productivity and competitiveness.

The question of whether the ESIF positively affects economic growth is yet to reach a conclusive verdict in the academic literature. Benkovskis, Tkacevs and Yashiro (2018) on the one hand, find a positive effect of ESIF on economic performance in the case of Lithuanian businesses. They found that greater support obtained through the European Regional Development Fund has had an immediate effect on the capital stock per worker and firm revenue, and has led to productivity increases three years following project implementation. On the other hand, Peciar and Wittemann (2019) point out a lower productivity, albeit faster growth, of firms characterized by higher ESIF support in Slovakia. At the same time, the authors also acknowledge that ESIF can help small and medium-sized enterprises in their expansion or technological upgrading.

According to the metaanalysis by Dall'erba and Fang (2017), the average estimated elasticity of ESIF with respect to GDP per capita growth is around 0.174 with a range of -7.6 to 6.3. The heterogeneity in these results may be caused by a number of factors, whereby the publication year seems to be playing a crucial role. A possible explanation is that the European Commission has learned to set more efficient rules and guidelines for fund implementation over time. Alternatively, researchers may now be using more sophisticated methods for evaluating ESIF-related questions. For instance, to address the issue of reverse causality in the context of economic growth and ESIF spending, Becker et al. (2010, 2012) and Pellegrini et al. (2013) use the threshold for the implementation of the Convergence Objective (GDP per capita of 75 % of EU average) in an application of the regression discontinuity

[10] Data as of Jan 30, 2020. The value does not include the Rural Development Programme.

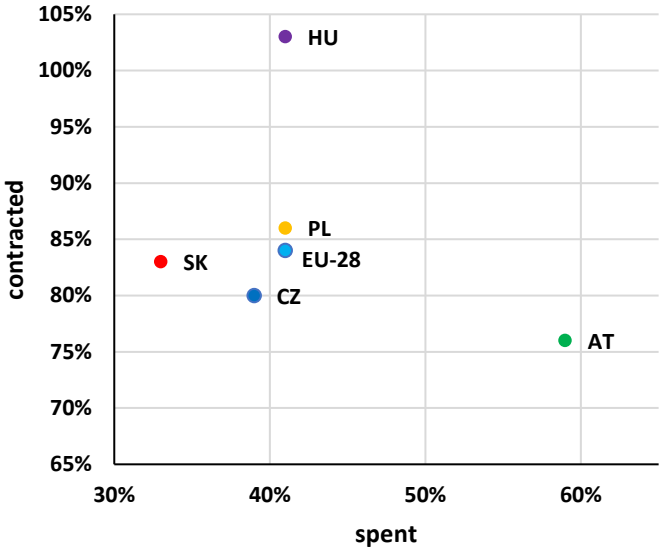
design. Likewise, Fidrmuc et al. (2019) use the presence of protected natural areas in the region as an instrument for ESIF. These studies have all found a positive effect of ESIF on regional economic growth.

Fattorini, Ghodsi and Rungi (2018), however, obtained mixed results in their study— they found a positive relationship between firm-level productivity and the volume of ESIF support directed at research and innovation, but also a negative relationship between productivity growth and overall ESIF support. The lack of consensus in the relationship between ESIFsupport and economic performance is apparent. Nonetheless, this does not alter the fact that the ESIFrepresent a significant source of capital that Slovakia is a net recipient of, and are directed at sectors closely related to productivity and competitiveness. Thus, a discussion of the effective allocation and spending of these funds cannot be omitted from our discussion.

ESIF spending in Slovakia over the programming period of 2014 – 2020 is around 28.7 % of allocated funds, which roughly equates to 3.955 billion euros. The largest portion of these funds is utilized for infrastructure projects (Figure 3.11). In terms of productivity, however, what is worrying is the extremely low rate of ESIF spending in the area of research, technological development and innovation: only 10.8% of the allocated 1.678 billion euros has been spent at the point of writing. The inability to absorb these funds to support technological progress hinders our TFP growth potential. The areas of education and human capital development, as well as improving the access to ICT suffer from the same problem.

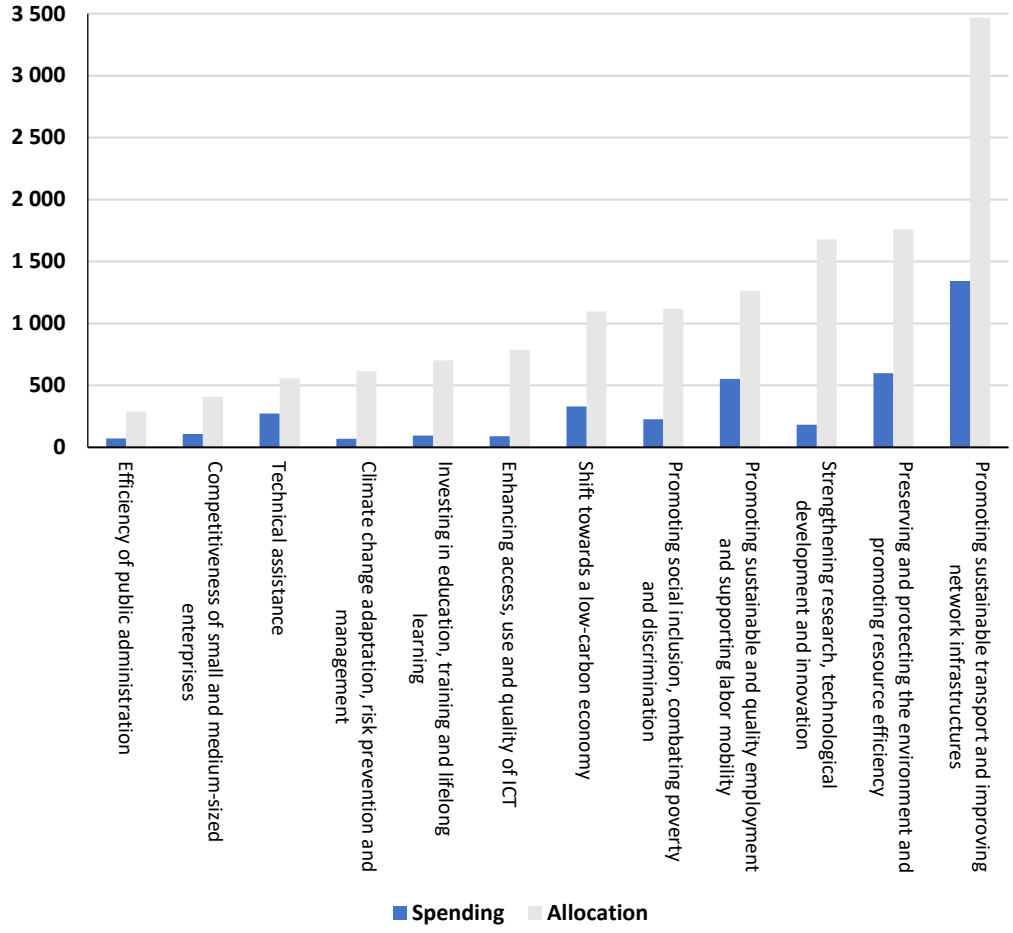
In a similar manner, Labaj (2020) points to the weak usage of European funds in Slovakia: Slovakia reports one of the lowest absorption rates of the European Regional Development Fund within the EU in the third programming period. What is more, Slovakia has seen a decrease in its ESIF spending in comparison to the previous programming period 2007 – 2013. The problem is also apparent when looking at Figure 3.10, where Slovak ESIF spending is clearly the lowest in the region and below the EU-28 average. According to the cohesion data of the European Commission, only Croatia reports a lower rate of ESIF spending. The low ESIF spending rate has resulted in a missed opportunity of more significant GDP growth—Labaj (ibid.) reports Slovakia could have grown by over 3 % in 2019, had it spent the allocated funds at a rate comparable to the V4 economies. Žúdel (2020) expects the economy to regain dynamism in 2023, due to the increased ESIF spending as a result of the third programming period coming to a close. Public investment and consumption is expected to be stimulated as a result. However, this growth in ESIF spending must be interpreted with a degree of caution, as it is merely an accounting effect and can rather be a negative phenomenon for the economy. For instance, rushed ESIF spending may lead to the adoption of low-quality projects. Likewise, a large volume of spending at once may cause the overheating of the economy. Hence, for ESIF to truly be an enabler of economic development, it is not only the volume of funding that matters, but also the manner in which these funds are spent.

Figure 3.10: Implementation of ESIF in the programming period 2014 – 2020 by country (2019)



Source: European Commission.

Figure 3.11: The state of ESIF implementation in Slovakia for the programming period 2014 – 2020 by thematic objective (in mil. EUR)



Source: ITMS2014+, MF SR, PS INTERACT III and Interreg V-A SK-AT.
Note: Data as of Jan 31, 2020. Only EU funds are displayed.

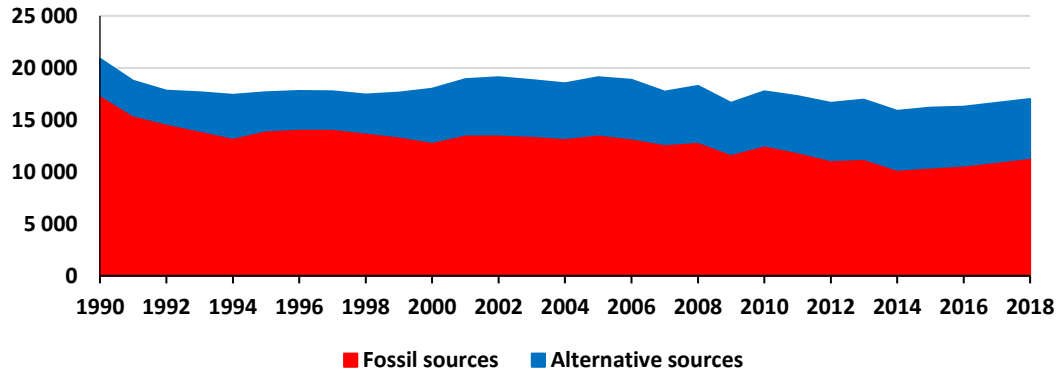
3.5 Energy

Climate change and environmental degradation have come to the forefront of public debate in recent years. It is now a relatively undisputed fact that in order to achieve sustainable growth, it is necessary to become less dependent on traditional non-renewable energy sources. Contrary to the mainstream view, whereby environmentally favorable regulations or actions and economic performance are seen as conflicting, the view that these two elements tend to go hand in hand is gradually gaining popularity. Mazzanti and Zoboli (2008) also take this view, as they conclude in their empirical study of energy efficiency and labor productivity — productivity seems to go up with decreasing emission intensity of production. A possible explanation for this observation may be greater pressure on innovation that more stringent environmental regulation brings about, what may translate into complementary productivity gains (Jaffe et al., 1995). It may also be the case that such firms are more conscious about the optimal allocation of their inputs.

With growing environmental awareness, the share of renewables in total energy consumption is increasing worldwide. Greener energy sources are gradually becoming more represented in Slovakia as well, yet most of the primary energy supply still consists of fossil sources, i.e. coal, crude oil and natural gas (Figure 3.12). Biomass and waste recorded the largest increases, while the supplies of wind, solar or hydropower energy remain generally negligible or non-existent in Slovakia (Table 3.6). As Figure 3.13 illustrates, consumption of renewable energy in Slovakia is among the lowest in the EU and even shows a mild downward trend over the recent years. While the share of renewables stood at 11.49% of total energy consumption in Slovakia in 2017, the EU-28 average was 17.53% and the maximum value was 54.5%. Regional comparison also shows that the V4 countries consume significantly less renewable energy than Austria, where 32.56% of total energy consumption comes from sustainable sources.

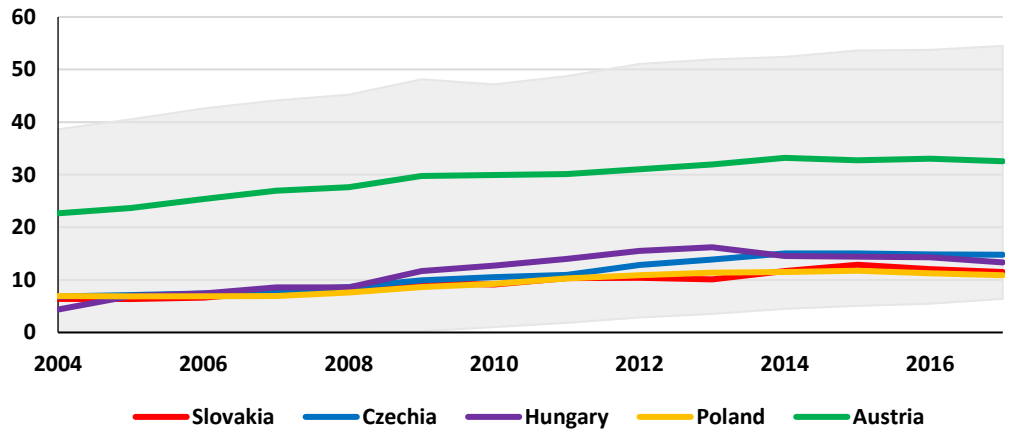
In 2016, the Directive of the European Parliament and the Council of the European Union on the reduction of emissions of sulfur dioxide (SO2), nitrogen oxides (NOX), non-methane volatile organic compounds (NMVOC), ammonia (NH3) and fine particulate matter (PM2.5) was adopted in Slovakia, based on which the National Program for Emissions Reduction is in the process of being elaborated. As EU member states are bound by obligations under this Directive, we may see a rise in investment in the area of renewable energy going forward.

Figure 3.12: Primary energy supply in Slovakia by source (in kt of oil equivalent)



Source: International Energy Agency.
Note: Fossil sources include coal, crude oil and natural gas. Alternative sources of power include wind, solar, hydro, nuclear, biomass and waste.

Figure 3.13: Renewable energy consumption (in % of total energy use)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole.

Table 3.6: Primary energy supply in Slovakia by source (in % of total)

	1990	1995	2000	2005	2010	2015	2018
Coal	37.5%	30.5%	23.8%	22.2%	22,00%	20.3%	19.5%
Crude oil	21.5%	19.1%	15.7%	18.1%	20.4%	20.2%	23.2%
Natural gas	24.4%	29.5%	32.1%	30.8%	28.2%	24.0%	24.0%
Wind and sun	0.0%	0.0%	0.0%	0.0%	0.1%	0.4%	0.4%
Nuclear	15.0%	16.9%	23.9%	24.4%	21.7%	24.7%	23.1%
Biomass and waste	0.8%	1.6%	2.3%	2.4%	5.0%	8.5%	8.1%
Water	0.8%	2.4%	2.2%	2.1%	2.5%	2.1%	1.8%

Source: International Energy Agency.

4 Human capital

In economics, human capital is perceived as a factor of production that shares multiple characteristics with physical capital: it is built gradually through costly investment (whereby the cost may not necessarily be of financial nature but can also take the form of time and effort), it is associated with an identifiable rate of return for individuals as well as the society, and unless we maintain it and invest in it continuously, it declines and deteriorates over time. Like physical capital, human capital is also an important determinant of economic growth and development. Increasing the level of human capital enables new ideas to be discovered and shared with others, leading to progress within the society as a whole (Jones & Romer, 2010). Human capital is also significant for the quality of life on an individual level: educated people have higher earnings, faster career advancement, and have a greater likelihood of being employed or participating in the workforce. Human capital is also linked to a multitude of non-financial returns: educated people tend to be less involved in crime, show higher civic participation (for example, higher voter turnout or higher likelihood of contributing to charity), and enjoy better health (and this benefit tends to extend to their children as well).

In this chapter, we will explore various aspects related to human capital in Slovakia—quality of education, science, research and development, as well as finding employment in the labor market.

4.1 Education

The results of the Program for International Student Assesment (PISA) are widely used to compare the quality of education across countries. The internationally standardized PISA allows OECD to monitor the performance of 15-year-olds in the fields of mathematics, science and reading comprehension every three years. Table 4.1 shows that the results in Slovakia deteriorated in the observation period, further widening the gap between Slovakia and other countries. While the latest testing in 2018 shows a slight improvement, the number of underperforming students in Slovakia across all categories remains nonetheless worrying. For instance, up to 31.4% of Slovak pupils have difficulty comprehending text (OECD 2019c). Given that the PISA testing system is set in a way that assesses the state of knowledge of pupils reaching the end of their compulsory education and examines areas relevant for labor market participation, the observed long-term negative trend may translate into a slowdown in labor productivity growth in Slovakia in the future.

The results of Slovak pupils largely reflect on their socio-economic background (Figure 4.1). As Varsik (2017) points out, a weaker socio-economic background of a student is associated with a higher rate of repetition of a grade as well as a later start to schooling, which in turn negatively affects the outcome of the PISA test in the field of science. Frequent grade retention is also related to the fact that children from socially disadvantaged backgrounds have a higher probability of finishing the education process by reaching the compulsory schooling age and do not complete the full 10 years of schooling. Hence, they often do not participate in Grade 9 testing (ÚHP, 2019).[11] Furthermore, the study warns that in comparison to other OECD countries, the Slovak education system separates children into parallel

[11] In the academic year 2017/18, 3.02% of grade 9 students were from socially disadvantaged backgrounds and marginalized communities (against 9% in grade 1), as well as 2.67% of students from marginalized communities without social disadvantage (against 3.95% in grade 1). The population of socially disadvantaged students not from the marginalized communities represented 4.94% of all grade 9 students, against 6.22% in grade 1 (ÚHP, 2019).

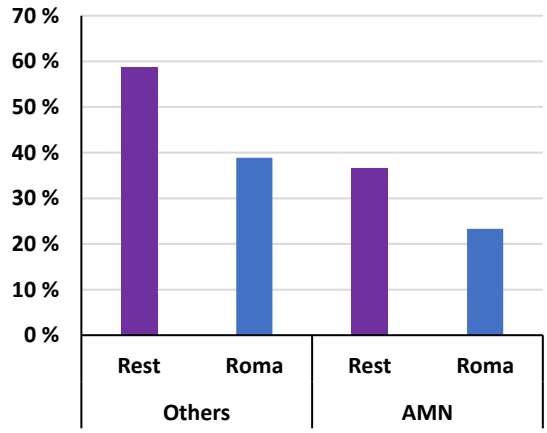
schooling tracks at a younger age (11 vs 14.3 years of age). An earlier stratification of children can exacerbate existing social and economic segregation and increase inequalities that prevail between students and, later, adults. Furthermore, the share of youth not in education, employment or training (NEET) in Slovakia is the highest in the region, along with Hungary (Figure 4.2). Still, the values for Slovakia do not fall very far from the EU mean.

Table 4.1: PISA test results by areas of examination

		2003	2006	2009	2012	2015	2018
Results from reading literacy (average score)	**SK**	469	466	477	463	453	458
	CZ	489	483	478	493	487	490
	HU	482	482	494	488	470	476
	PL	497	508	500	518	506	512
	AT	491	490	470	490	485	484
Results from mathematics literacy (average score)	**SK**	498	492	497	482	475	486
	CZ	516	510	493	499	492	499
	HU	490	491	490	477	477	481
	PL	490	495	495	518	504	516
	AT	506	505	496	506	497	499
Results from science literacy (average score)	**SK**	-	488	490	471	461	464
	CZ	-	513	500	508	493	497
	HU	-	504	503	494	477	481
	PL	-	498	508	526	501	511
	AT	-	511	494	506	495	490

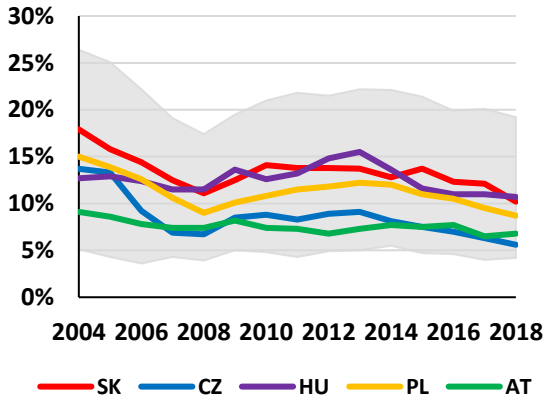
Source: OECD.
Note: PISA scores are adjusted to have a normal distribution with the OECD mean score of around 500 points with a standard deviation of 100 points. In 2009, there was a weeklong boycott of PISA testing in Austria due to a conflict between teachers and the ministry of education; hence, the 2009 Austria value is given as an estimate.

Figure 4.1: Average success rates of socially deprived groups in the Grade 9 exam (in %)



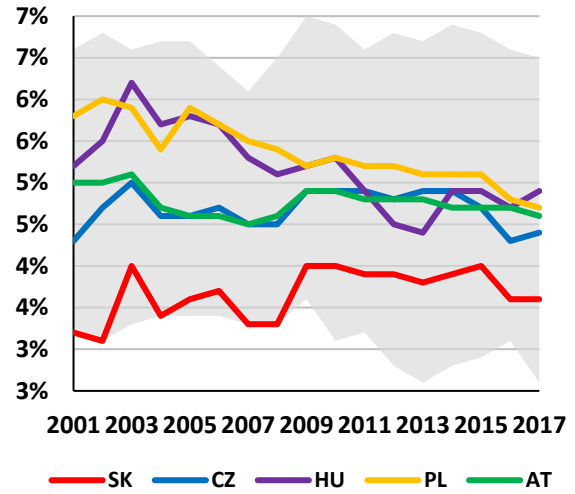
Source: Habodászová (2019).
Note: AMN stands for recipients of material need assistance.

Figure 4.2: NEET rate (in % of population between the age of 15-24)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The NEET rate is the share of young people not in education nor employment.

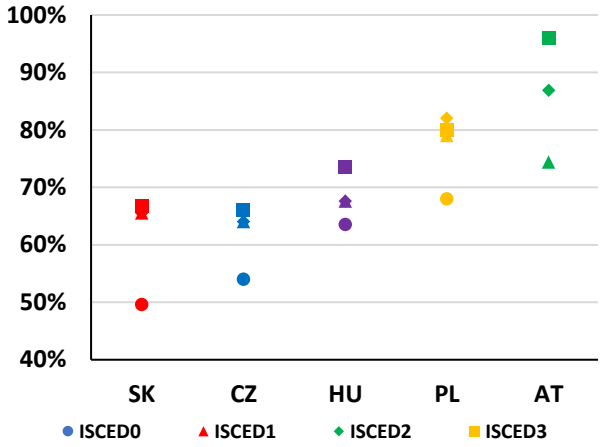
Figure 4.3: Public expenditure on education (in % GDP)



Source: Eurostat.

Note: The gray band captures the range of values recorded in the EU as a whole.

Figure 4.4: Average wage of teachers aged 25-64 years (as % of the average wage of a tertiary educated person in 2017).



Source: OECD (2019b).

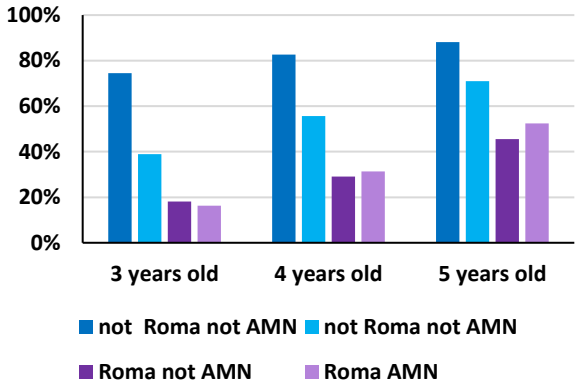
Note: ISCED is the International Standard Classification of Education. Individual levels represent pre-primary education (0), first primary education stage (1), second primary education stage and 5th to 8th grages of 8-year grammar schools (2), and upper secondary education concluded by a school leaving examination (3).

The Slovak education system is underfinanced in comparison to other countries. Figure 4.3 illustrates total spending on education as a percentage of GDP. We can see that the expenses related to education in Slovakia fall behind those of neighboring countries and rank among the lowest of EU values. Greater investment in education, especially coupled with reforms of the education system that would increase the quality of learning, could boost education in Slovakia. [12] One of the areas where an increase in spending could help is raising teachers' wages. Wages of Slovak teachers in 2017 did not even reach 70% of the average income of persons with tertiary education, which, together with the Czech Republic, is the lowest of the other countries under review (see Figure 4.4). This difference is especially pronounced for new teachers, which, in combination with a sense of lack of appreciation by the society, may be a disincentive for choosing the career of a teacher (ÚHP, 2017 and Perignáthová, 2019).[13] This problem is particularly acute in the Bratislava region, where in 2018 the ratio of teachers' earnings to the wages of the population with tertiary education reached only 61%, while the ranges in other regions lied between 78% and 98% (Vitáloš, 2019).

[12] The initiative "To dá rozum" (which can roughly be translated as "It makes sense") proposed reforms based on an in-depth data analysis. Their recommendations are directed at three main goals—increasing the quality of education across all levels, providing equality of opportunity for all children, and creating a positive workspace and work atmposphere for children and teachers. Source: https://analyza.todarozum.sk/docs/. Increased education spending alone may not help. It must be coupled with other reforms. OECD (2016) points to the fact that increased spending per student has the potential of improving PISA scores mostly in low-income countries, which Slovakia is no longer.

[13] It must be noted that in the last two years, the wages of teachers have grown by 10% annually, with additional increases for young teachers (IVP, 2019). OECD data on the ratio of teachers' wages to average wages of those with completed tertiary education are only available up to 2017, hence this increase is not displayed.

Figure 4.5: Participation rate of children in pre-school education by age (in % of social and age group)



Source: ÚHP (2019).
Note: AMN stands for recipients of material need assistance.

Investment in kindergartens must also be strengthened. Smidova (2019) sees two channels through which the attendance of kindergartens can help children to achieve better results in the educational process. The first is through an increase in household income by enabling both parents to work.[14] Socio-economic background often significantly affects children's education. The second channel is the cognitive ability of children themselves. Children learn the fastest during the first five years of their life. Therefore, properly delivered care in an intellectually stimulating environment has a major impact on lifelong results. Children are more likely to succeed in the labor market, tend to be more successful in social life, and less likely to be involved in criminal activities, if they develop their language skills, motor skills, self-control and social relations early. Although the care of parents remains most important at an early age, preschool care can work to enhance the influence of parents (Shuey a Kankaraš, 2018).

Slovakia lags behind in the pre-school education rate. The rate of pre-schooled children aged 3-5 years reaches approximately 75%, placing Slovakia in the penultimate place within the EU (ÚHP, 2019). As can be seen in Figure 4.5, pre-school education at this age is significantly lower for children from socially disadvantaged groups and marginalized Roma communities (MRC). Increasing their pre-school enrollement rate could help improve young people's skills (OECD 2020a). ÚHP (2019) also claims that the main barrier is the poor availability of kindergartens in municipalities with higher concentrations of MRCs and insufficient inclusion. Varsík (2019) and OECD (2019b) recommend increasing investment in kindergartens, as the existing infrastructure can only provide a place for compulsory preschooling for 91.3% of five-year-olds. Yet, existing capacities do not even suffice to accommodate 75% of five-year-olds in much of the districts of southern and eastern Slovakia.[15]

Pre-school education will need to be made more inclusive with increased capacity. In this context, OECD (2020a) points to the success of the Omama project. The non-profit organization The Way Out selects one mother, the so-called *Omama*, in the Roma community, which is not only well respected

[14] This claim is contingent upon the affordability of pre-primary care.
[15] In 2019, a law (No 209/2019) on compulsory pre-school education of children aged five years was passed, effective of 2021. This represents a positive step towards greater training at the pre-school age, as well as a call to build the necessary infrastructure.

in the community, but is also reliable and responsible. After undergoing early childhood development training, Omamas help develop the skills of children aged 0 to 3 years through activities and games for children, and provide advice to parents. OECD (2020a) proposes the extension of this project to older children between the ages of 3 and 5 by educating parents about the importance of pre-schooling and the administrative issues needed to enroll in pre-school education. Moreover, ÚHP (2019) points out the lack of Roma-language speaking nursery teachers as well as the lack of support staff needed to integrate disadvantaged groups. Given that pupils' results are strongly correlated with their socio-economic backgrounds (as was shown in Figure 4.1), expanding pre-school attendance of children from economically disadvantaged families and MRCs has the potential to contribute significantly to blurring the differences stemming from different socio-economic situations that children come from.

4.2 Science, research and development

Slovakia is falling behind in its innovative capacity. Table 4.2 shows the evolution of multiple innovation and R&D indices over time. Each index focuses on different areas: the aforementioned Digital Economy and Society Index (DESI) focuses on the digitization of society and its ability to exploit digitalization, while the Global Innovation Index (GII) and the European Innovation Scoreboard (EIS) focus on the innovation environment. All three indices point to a larger gap between Austria and the Czech Republic and the remaining three V4 countries. The EIS categorizes Slovakia as a moderate innovator, one that excels at marketing innovations, but lags behind in many other areas, especially in research.

One of the reasons behind Slovakia's relatively poor results is the low level of R&D expenditure. In the EIS, it is precisely the financing and promoting of innovation that is rated as the weakest in Slovakia relative to the EU average. Figures 4.6 and 4.7 show the evolution of the ratio of R&D expenditure financed from public and private sources in relation to GDP. In both cases, Slovakia has one of the lowest R&D expenditures in the region, as well as in the EU overall. The short-term increase in public funding in 2015 is due to increased spending of ESIF as a result of the end of the 2007-2013 programming period. OECD (2017a) reports that in that particular year, Slovakia ranked fifth in the sum of ESIF spent on research and development.[16]

Private R&D funding in Slovakia is growing steadily. If private R&D expenditure could be increased to the OECD average (1.3%), our GDP could increase by 1.4% in the next ten years (OECD, 2019d).[17] However, it should be noted that the calculation is based on an analysis from 2017. Since then, thelevel of R&D expenditure, which is tax-deductable, has changed substantially. The level of this deduction is gradually increasing from 25% in 2018 to 200% in 2020, making Slovakia one of the countries with the highest tax support for private R&D (IFP, 2019). Peciar and Witteman (2019) propose that, in addition to tax relief, R&D conducted by the private sector ought to be supported through loans that could be used to procure new technologies or to expand to foreign markets.

[16] It can be seen in Figure 4.6 that the remaining V4 countries, which were also among the five countries with the highest R&D funding through the ESIF, saw a decline in public R&D funding with the end of the 2007-2013 programming period.
[17] This forecast assumes fiscally neutral policy.

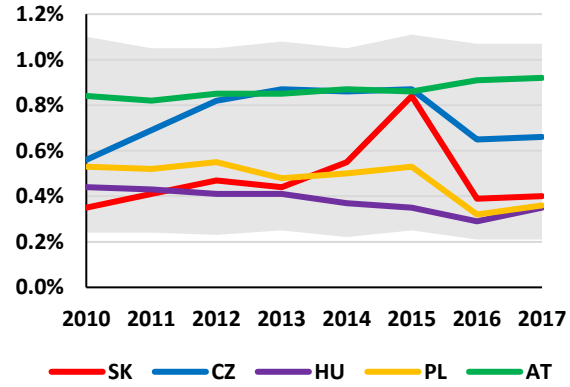
Table 4.2: Overview of various innovation indices (in % of EU-28)

		2014	2015	2016	2017	2018	2019
DESI (score as a % of EU-28)	SK	85.00%	83.3%	82.61%	87.27%	89.41%	88.25%
	CZ	92.61%	97.76%	95.37%	96.49%	95.64%	95.23%
	HU	81.74%	82.7%	84.17%	85.41%	86.66%	86.46%
	PL	74.14%	74.67%	74.22%	76.99%	77.92%	86.46%
	AT	105.87%	106.47%	105.87%	104.73%	104.21%	102.7%
EIS (score as a % of EU-28)	SK	65.35%	65.98%	66.38%	62.55%	63.5%	-
	CZ	83.24%	83.19%	79.24%	80.94%	82.15%	-
	HU	64,00%	64.1%	63.64%	64.05%	63.43%	-
	PL	50.3%	50.57%	51.73%	53.25%	56.15%	-
	AT	116.51%	114.73%	116.53%	114.72%	114.7%	-
GII (score as a % of EU-28)	SK	84.56%	85.82%	83.91%	87.05%	86.48%	85.54%
	CZ	101.31%	102.38%	99.4%	102.3%	98.17%	100.61%
	HU	90.01%	85.82%	89.95%	83.64%	90.51%	90.63%
	PL	81.94%	80.23%	80.89%	84.25%	84.06%	84.11%
	AT	107.77%	107.97%	105.84%	106.51%	103.41%	103.67%

Source: European Commission, INSEAD.

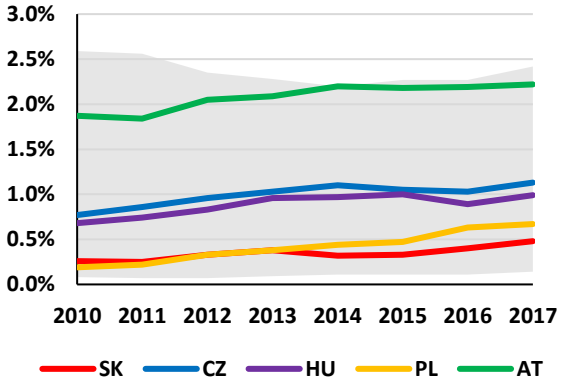
The cooperation between the public and the private sector in R&D is also problematic. Cedzová and Rybanská (2020) point to the untapped potential of science parks and research centers in Slovakia, and aim to improve the linkages between the public and private sectors in research and its application. However, the authors identified several barriers in this cooperation. As the study shows, at present, Slovak science parks are funded by the faculties themselves, yet their resources are merely sufficient for maintenance. Furthermore, they often do not have the possibility of renting out these facilities to the private sector for joint research activities. To tackle these issues, the authors propose granting permissions for the letting of premises to all science parks. Furthermore, research centers should be allowed to acquire the status of independent legal entities, enabling them to own patents. In this way, science parks would be able to fund themselves and cooperation between the two sectors could be boosted.

Figure 4.6: Public expenditure on research and development (in % GDP)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole.

Figure 4.7: Private expenditure on research and development (in % GDP)

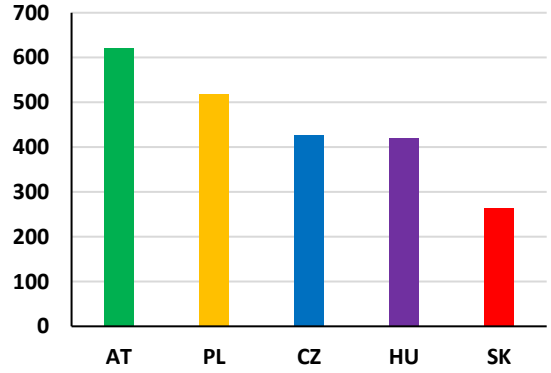


Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole.

Slovak universities achieve relatively poor research results. In order to provide high-quality university education, professors who are familiar with state of the art teaching methods, are able to use them and communicate them to students are needed. A relevant indicator for measuring the internationally standardized quality of research of university professors is the Hirsch index (H-index), which captures the productivity of scientists as the impact of their publications through citations.[18] Figure 4.8 shows that Slovakia lags significantly behind all the countries under review in the H-index based on articles available in the Scopus database. Furthermore, ÚHP (2017) points out that in comparison with other EU countries, Slovak universities publish an extremely high share of work in conference proceedings, even in fields where this practice is not common. In 2017, the system of funding universities changed to give more consideration to the scientometric ranking of publications in current research journals[19] and journals found in the Web of Science and Scopus databases. The long-term impact of this change cannot yet be assessed.

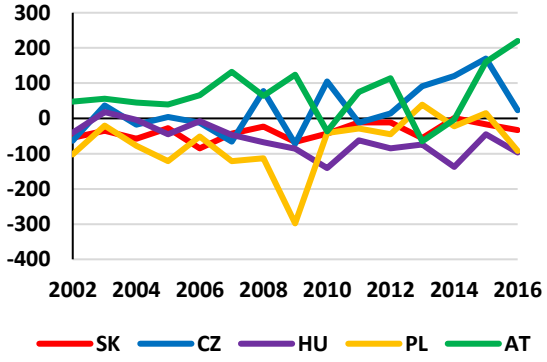
Inferior-quality research results do not help to reduce the brain drain experienced by Slovakia. Figure 4.9 shows that more scientists are leaving Slovak universities in the long term than are coming in. Likewise, Slovak students prefer university studies in foreign countries: the number of Slovaks studying abroad is three times higher than the number of foreign students enrolled in Slovak universities (see Figure 4.10). According to OECD (2019b), Slovakia has the second largest percentage of students studying abroad among EU countries after Luxembourg. This fact in itself may not be unusual for a small, open economy.[20] However, as Figure 4.11 shows, Slovak universities are not attractive to students from neighboring countries in the same manner, except Ukraine.[21]

Figure 4.8: H-index of university publications in the period between 1998-2018



Source: Scimago Journal & Country rank.

Figure 4.9: Net flow of scientific authors (number of persons)



Source: OECD (2017a).

Generally, superior students prefer studying abroad. Martinák and Varsik (2020) point out that the preference for studying abroad increases with academic performance in secondary school leaving exams. This applies in particular to those who score highly in in mathematics and English, where over 50% of the most successful students' decile continues onto university education outside of Slovakia.

[18] The H-index measures the maximum amount of scientific articles (H), which were cited at least H-times. In the context of Figure 4.8, this means that between 1998 and 2018, Slovak universities published 263 articles that were cited at least 263 times.

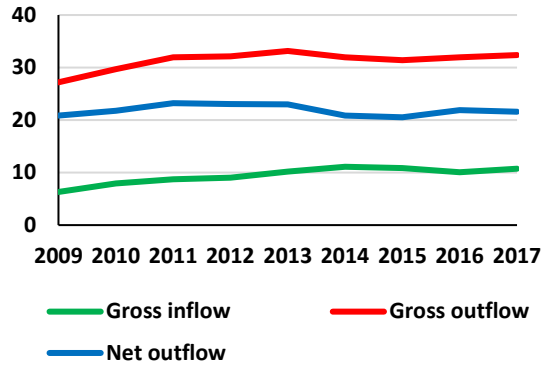
[19] Current journals are scientific journals that are included in the database *Current Contents* (https://clarivate.libguides.com/webofscienceplatform/ccc). This database tracks publications in peer-reviewed and scientifically higher rated journals.

[20] Czechia, Austria and Hungary are also small, open economies. However, they have a positive migration balance of students.

[21] Martinák and Varsík (2020) also warn that the majority of foreign students in Slovakia study on part-time programmes.

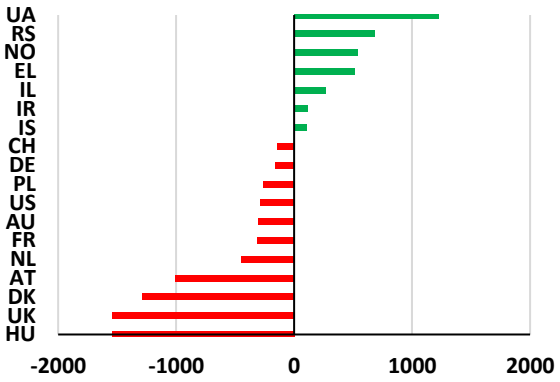
At the same time, these authors identify two channels through which the outflow of students adversely impacts the Slovak economy. First one is through universities, which lose out on a large share of bright high school graduates. Since the return rate of these students is low and the majority of Slovak scientists living abroad first emigrated for their undergraduate or graduate study, it is not only teaching that suffers, but also the scientific work of universities. The second channel is the effect on the labor market through an outflow of qualified human capital, without an offsetting flow from other countries.

Figure 4.10: Student migration balance (in thousands)



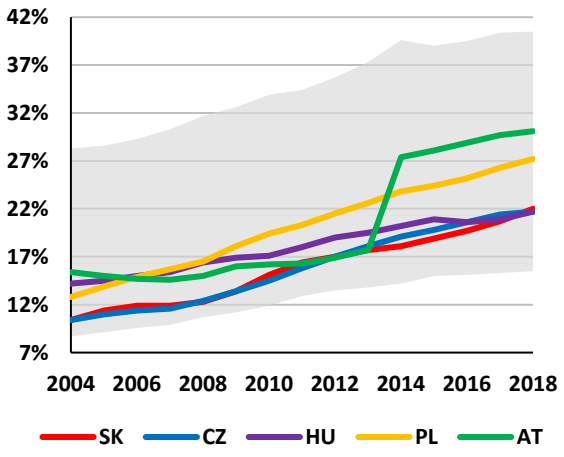
Source: UNESCO.
Note: The inflow of foreign students to Slovak universities and the outlow of Slovak students to foreign universities are shown.

Figure 4.11: Student migration balance by country (in thousands in 2017)



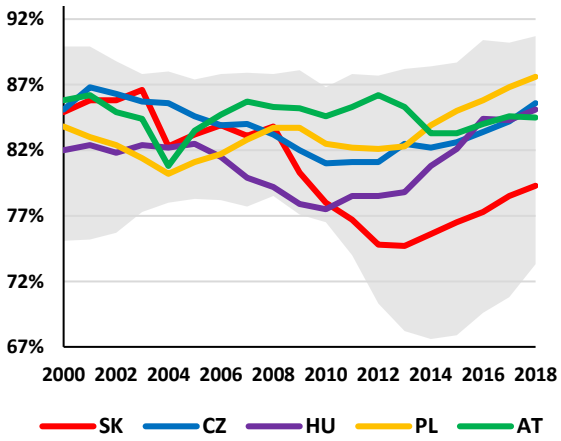
Source: UNESCO.
Note: The difference in the inflow of foreign students to Slovak universities and the outlow of Slovak students to foreign universities in 2017 is shown for countries, whereby the balance was smaller than -100 or greater than 100 with the exception of Czechia (-18 523) for visualization purposes.

Figure 4.12: Tertiary educated persosns (in % of population aged 25-64 years)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The sharp increase in Austria in 2014 may be due to the transition from ISCED97 to ISCED11.

Figure 4.13: Employment rate of persons with tertiary education (in % of all tertiary educated persons aged 25-64 years)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole.

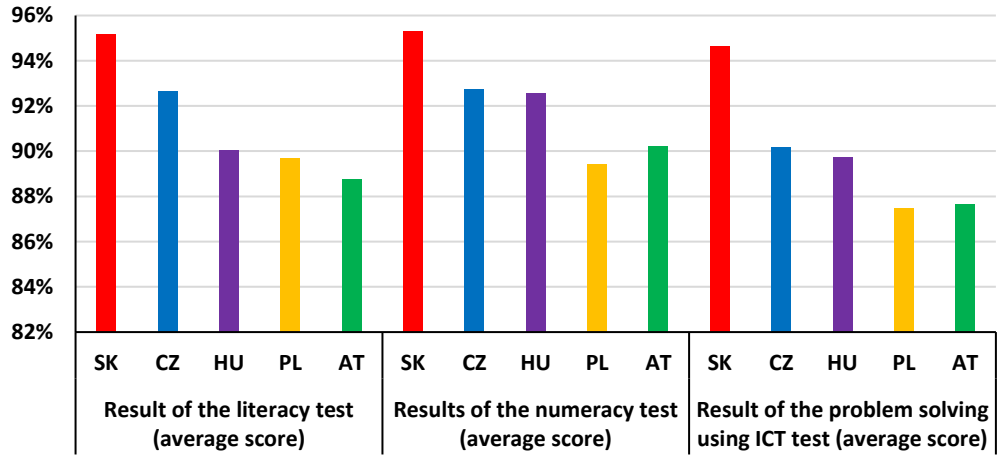
A relatively small share of the Slovak population has completed tertiary education. Along with Hungary and Czechia, Slovakia is among the EU countries characterized by the lowest share of university graduates in the working-age population (Figure 4.12). On the other hand, the share of educated individuals at the tertiary level shows a positive trend, suggesting Slovakia is slowly making its way up from the bottom of the EU range, gradually approaching the median.

Nonetheless, the employment rate of persons with higher education is relatively low. Figure 4.13 shows that while other neighboring countries exceed the EU average in this respect, Slovakia has been below the EU average since the Great Recession. OECD (2019b) also points out that Slovakia is inferior in terms of undergraduate employment (65%). Even individuals with completed secondary education as their highest attained level of education have a better chance of finding employment in the labor market (80%), which is a rather abnormal result, since the employment rate generally tends to increase with increasing levels of schooling.

4.3 Skills

Poor education quality negatively affects the skills possessed by adults. An indication of the impact that poorer pupil performance has, as shown with PISA test results, is also reflected in the latest OECD PIAAC test of 2012. Figure 4.14 shows the ratio of the average scores of the older age cohort to the younger cohort.[22] Compared to other V4 countries and Austria, this ratio is relatively high for Slovakia, suggesting poor young adult performance and good performance of pre-retirement adults compared to other countries. The picture of the deteriorating relative position of Slovakia in relation to similar countries confirms the unfavorable development in student test results. Without a change in this trend, it may significantly undermine the productivity and competitiveness of the Slovak economy. Slovakia faces the risk of an inferior human capital formation, as well as increased likelihood of Slovak human capital flowing to other countries. It is therefore necessary to create both favorable conditions for the creation of human capital as well as for its retention.

Figure 4.14: PIAAC test results of the cohort aged 55-59 years (in % of the 25-29 year old cohort results)



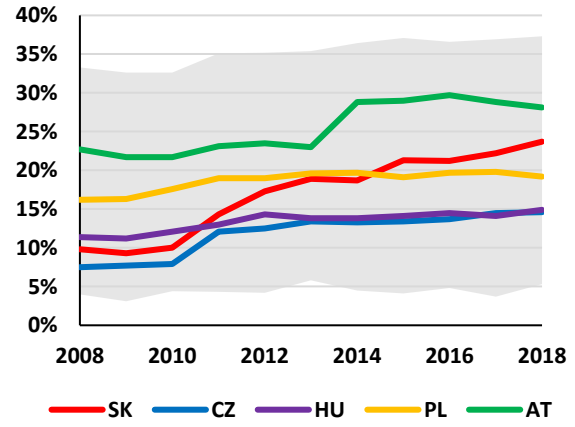
Source: OECD.

[22] A similar pattern holds for the ratio of the 60-64 cohort or the 50-54 cohort to 15-19 year olds or 20-24 year olds.

A decline in skill levels may have an impact on labor market mismatch, which may in turn negatively impact societal developments. On the employee side, mismatches equate to the inability to use one's acquired skills, suggesting they cannot increase their usefulness to the employer. This may translate into lower wages and job satisfaction. For employers, mismatches can mean higher costs of requalification and education, as well as higher turnover and lower productivity. For labor market mismatches, a distinction is made between skill (vertical) and field of study (horizontal) mismatches. The first describes a situation whereby a person works in a position with a different level of education than the position requires and is therefore either over-qualified or under-qualified for the job. The latter situation arises when a person works in a field other than the field of their study (Montt, 2015).

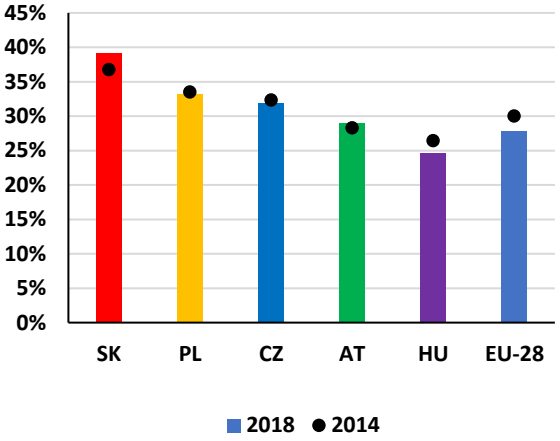
Mismatches in the Slovak labor market are quite significant from an international perspective. Figure 4.15 depicts overqualification in the labor market.[23] The development of over-qualification in Slovakia shows a turning point shortly after the Great Recession. Around that time, the employment of university graduates also began to decline (Figure 4.13). Hence, a possible explanation may be a lack of job opportunities for university graduates. In times of a shortage of jobs, a highly qualified person is left to choose between unemployment and work requiring less expertise.[24] Furthermore, as can be seen in Figure 4.16, the field of study mismatch in Slovakia is also high compared to the other countries under review and the EU average.

Figure 4.15: Overqualification of persons in the labor market (in % of employed tertiary educated persons aged 20-64 years)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole.

Graf 4.16: Horizontal mismatch of persons with secondary or tertiary education (in % of secondary or tertiary educated aged 15-34 years)



Source: Eurostat.

However, a field of study mismatch may not be a problem in itself. If a person is able to work in another field but uses the same set of skills, the negative impact on wages should be minimal. Rather, it becomes problematic when there is no link between qualifications and the field of study. Montt (2015)

[23] The data shown in Figures 4.15 and 4.16 are labelled by Eurostat as experimental statistics, as they rely on approximations in the qualification level and field of study or employment, by making use of the EU Labor Force Survey . Measurement relying on PIAAC test results is a possible alternative. For a discussion of how mismatches can be measured, see Montt (2015) and Martinák (2016).

[24] Vanteplas & Thun-Thysen (2019) estimate the correlation between unemployment and overqualification in the EU in 2007-2017 to be around 20 %. Verhest, Sellami & Van der Velden (2017) and Verhest & Van der Vellen (2013) point to the role played by economic cycles and structural problems in the labor market in vertical mismatches.

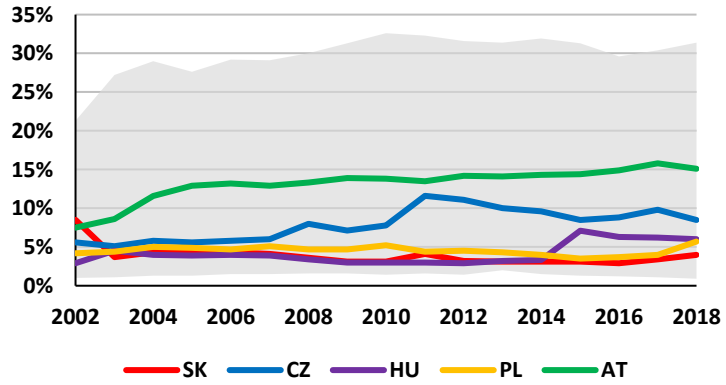
estimates the productivity gap in Slovakia arising from the field of study mismatch and over-qualification at 0.37% of GDP.

The most problematic fields in this respect are teaching, humanities, agriculture and veterinary medicine. Based on PIAAC test data, Martinák (2016) estimates that most field of study mismatches come about in the fields of humanities, agriculture and veterinary medicine. It is precisely in these fields that we observe the greatest saturation, i.e. a high number of graduates in relation to vacant positions. Yet, Martinák (2016) argues that graduates in these fields tend to have a greater set of transferable skills. However, teaching shows the highest number of instances of both skill and field of study mismatches. Martinák (2016) attributes this to the perceived unattractiveness of a teaching career and the resultant preference for different career paths by graduates.

Improved secondary education would also help with labor market mismatches. Slovakia is one of the EU countries with the highest proportion of secondary school pupils compared to other schools. However, according to Martinák and Zápražná (2017), 34.5% of secondary school graduates work outside their field of study. In part, this may be due to the absence of higher vocational education, which would strengthen the formal training for vocational skills with higher qualifications (IFP, 2019). Likewise, a better linkage of secondary school programmes to the industry would help. It is countries with a functioning dual system (such as Austria and Germany) or a labor market need anticipation system (such as the Nordic countries) that have the lowest level of field of study mismatch (Martinák, 2016).

Of equal importance is the issue of a lack of professionally oriented university courses. OECD (2017c) points to the negligible number of professionally oriented undergraduate programs. These programs could serve as an addition to secondary vocational schools. Furthermore, cooperation with industry in designing the curricula could bring about a reduction in the shortage of skills. Fazekas and Kurekova (2016) point out Sweden as a positive example of higher vocational education. Employers help in creating the content of the program. At the same time, during the free two-year study, students spend a quarter of their time training with a company. As a result, 80-90% of graduates find a job one year after graduation.

Figure 4.17: Lifelong learning (in % of population between 25-64 years of age)



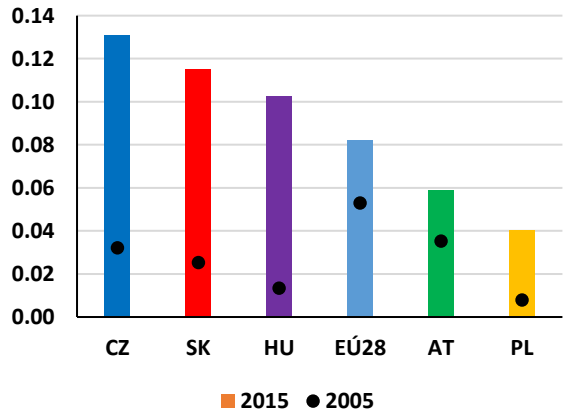
Source: Eurostat.

Note: The gray band captures the range of values recorded in the EU as a whole.

Lifelong learning can also help in reducing the negative impacts caused by mismatches. The ability to learn alongside work can help to align one's skills to the tasks they carry out (McGowan & Andrews, 2017). Figure 4.17 shows that the lifelong learning rate in Slovakia is among the lowest in the region and the EU overall.[25] Thus, lifelong learning represents an area that leaves significant room for improvement in Slovakia.

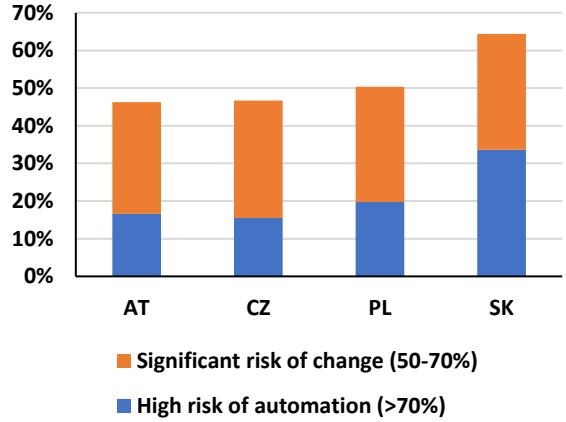
The automation of work is also related to skills in the labor market. The use of robots in Slovak industry sectors is high. Together with the Czech Republic and Germany, Slovakia has the highest density of industrial robots in the EU (Figure 4.18). Between 2005 and 2017, this ratio increased fourfold; an above-average growth rate. Growth in automation has the potential to polarize the labor market if automation replaces human work in sectors characterized by medium skill demands and routine tasks, while creating more demand for higher skilled and non-routine workers (Martinák, 2017). Figure 4.19 shows the risk of job losses due to automation. We can observe that in Slovakia, about a third of the employed fall into the high risk of robotization category, which is the highest among OECD countries. The region of Western Slovakia is classified as the OECD's most vulnerable region in terms of automation (OECD, 2018a). Between 2011 and 2016, employment increased in all regions except Central Slovakia, especially in occupations with a higher risk of automation, i.e. industrial workers and craftsmen (OECD, 2017a). These locations could become endangered in the future if the scope of automation expands. Martinák (2017) also mentions that from a global perspective, automation can threaten the Slovak economy through reverse offshoring. New technologies can enable foreign companies to move their production back to their domestic markets. At present, Slovakia is still protected by relatively low labor costs, but as our discussion of slowing productivity growth and continued growth in labor costs has shown, this advantage may be lost in the near future.

Figure 4.18: Intensity of robot use in manufacturing (in millions USD in current prices)



Source: OECD (2017a).

Figure 4.19: Jobs at risk of automation (2013, in % of employed)



Source: OECD (2018a).

[25] The measure of lifelong learning captures the share of adults aged 25-54 who have reported partaking in any form of formal or informal education within four weeks prior to the survey.

4.4 Employment and wages

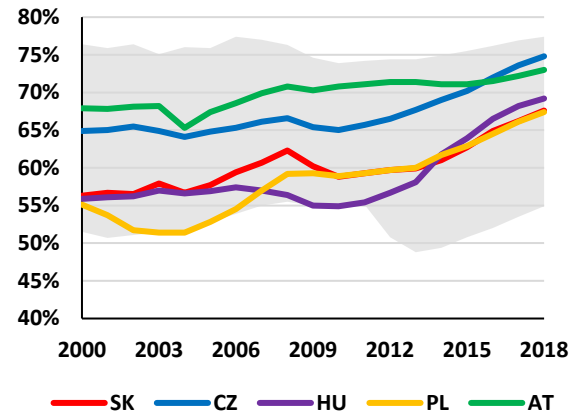
Employment is rising and unemployment is falling (Figures 4.20 and 4.21), in both cases since 2012, in Slovakia and in other EU countries. Unemployment lowers productivity at an individual level through a deterioration of skills. This is particularly true for long-term unemployment, which remains a problem in Slovakia. Hence, the situation in the labor market is important for the productivity and competitiveness of an economy.

Because Slovakia was less affected by the Great Recession than other EU countries (Figure 1.2), it achieved above-EU-average results in terms of both indicators. However, it still lags behind other V4 countries and Austria. The main problem is long-term unemployment and employment of the MRCs. Slovakia has a relatively high share of long-term unemployment, with MRC members being disproportionately represented (OECD, 2019d). Unemployment in this social group is significantly higher than that of the majority population (Figure 4.22). In the long term, unemployment of this group has been on a decline. However, Hidas et al. (2018) point out that the slight increase recorded in the employment rate of this social group may suggest that the decline in MRC unemployment is to some extent a result of tightened labor office rules and regulations. These allow for the exclusion of the unemployed due to non-cooperation, which would mean that the fall in unemployment was at the expense of higher non-participation in the workforce. Their study also suggests less MRC support with employment support tools or the application of ineffective tools such as activation work that does not allow one's skills to be increased. Machlica et al. (2014) also point to the discrimination faced by MRC members in the labor market. By sending out CVs that differed only in the names of jobseekers, they found that jobseekers with typical Slovak names were invited to an interview in 40% of cases, as opposed to 17.7% of jobseekers with a common Roma name. An important part of the solution to these problems is the timely availability of effective employment support tools in order to reduce the likelihood of long-term unemployment among disadvantaged groups.

The integration of the MRC is a crucial societal challenge. Figure 4.23 shows the weak intergenerational mobility of MRC. Its strengthening would help economic development in Slovakia. Bednárik, Hidas & Machlica (2019) point out that if employment of the MRC were at the same level as the employment of the majority population, GDP in Slovakia would be more than 12% higher in 2060 and the GDP growth would increase by 0.3 percentage points per year. As a possible solution, they propose increasing spending on active labor market measures and focusing more on MRC in active measures. In particular, increased spending could be directed at effective training measures, as they can improve skills and increase the likelihood of employment, especially if linked to the needs of local employers. [26] As an example, Bednárik, Hidas & Machlica (2019) cite health mediators or teaching assistants, which could also help with other aspects of MRC integration - their education and health.

[26] Petráš (2019) indicates that it is precisely the creation of more qualified temporary positions, such as posts in administration or services, which help disadvantaged jobseekers the most (persons over 50 years of age, the long-term unemployed or persons with lower education than secondary vocational education). Specifically, graduates have a 20-25 p.p. greater chance of finding employment in these positions compared to the control group, while the average employment efficiency of this measure on employment is 14 p.p.

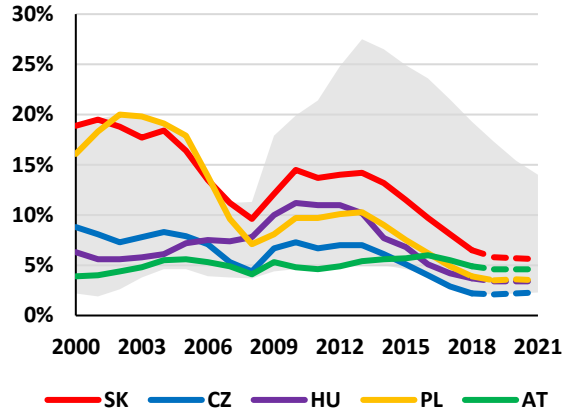
Figure 4.20: Employment (in % of population aged 15-64)



Source: Eurostat.

Note: The gray band captures the range of values recorded in the EU as a whole.

Figure 4.21: Unemployment (in % of economically active population)

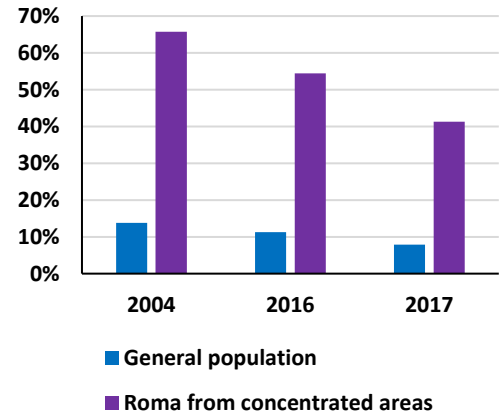


Source: Eurostat.

Note: The gray band captures the range of values recorded in the EU as a whole.

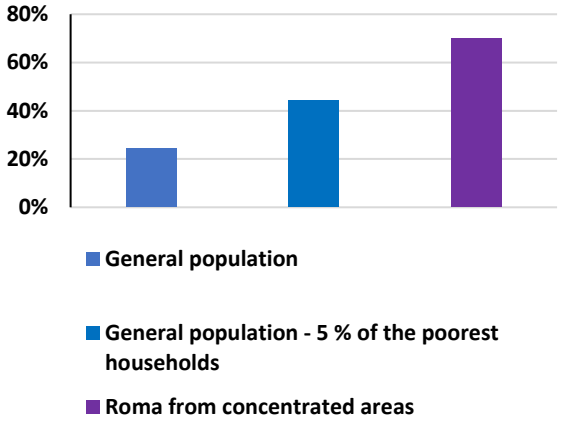
More information can also help to reduce the discrimination faced by MRCs. Gatti et al. (2016) mention a positive example from Košice, where US Steel used the help of a local church active in the Roma community to identify skilled Roma keen to find work and employed them in their plant. In this way, social workers were able to overcome the existing stigma. At the same time, data on health and social needs of the Roma would help job centers to tailor training measures individually.

Figure 4.22: Unemployment within socio-ethnic groups (in % of economically active population)



Source: ÚHP (2019).

Figure 4.23: Probability of being unemployed or earning less than the minimum wage according to parents' economic and ethnic status (in %)

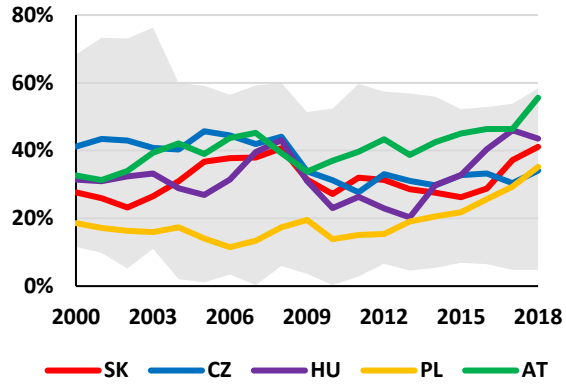


Source: Rizman (2018).

Regional disparities in unemployment persist. All countries in the region rank among the EU member states with highest unemployment disparities (Figure 4.24). Looking at Figure 4.25, we can see that self-governing regions can be divided into two groups: three self-governing regions (Banská Bystrica, Košice and Prešov) have long-term high unemployment, while others have relatively low unemployment. The Nitra self-governing region is exceptional in the sense that it has successfully

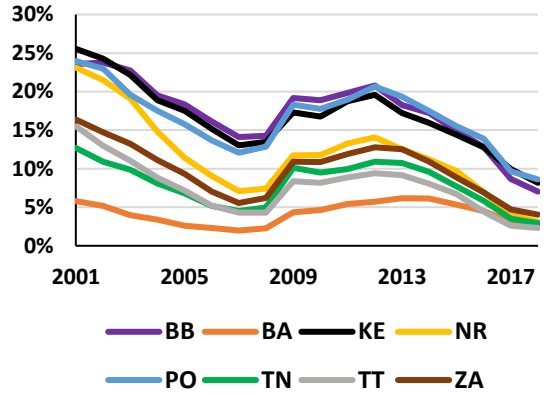
moved from the higher unemployment group to the lower unemployment group. The reason may be an increase in foreign direct investment in this region after 2001.

Figure 4.24: Coefficient of variation of unemployment on the level of NUTS 2 regions



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The term coefficient of variation is used to label the ratio of the standard deviation to the mean.

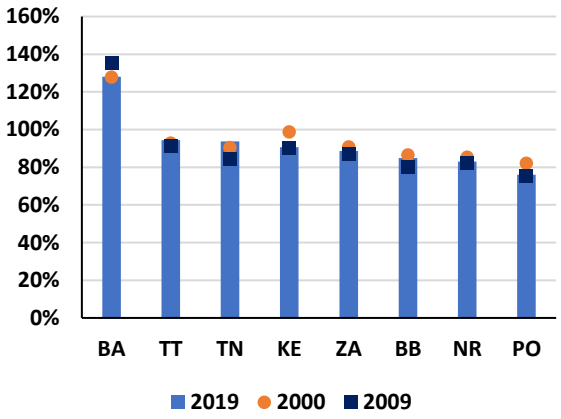
Figure 4.25: Unemployment rate in Slovak regions (in % of all economically active population)



Source: SO SR.

The wage gap between regions is stable: it has not changed much since 2000 (Figure 4.26). In comparison with the average of the whole country, the salary decreased only in the Košice and Prešov regions. A study by Gertler et al. (2020) looks at differences in salaries adjusted for purchasing power, tax-levy and housing costs. Since housing prices and costs are higher in the Bratislava Region, regional disparities are halfed if disposable real wages are concerned. Relatively high housing prices, however, hamper the Prešov region in catching up to the remaining regions.

Figure 4.26: Average wage by Slovak Regions (in % of national average wage)

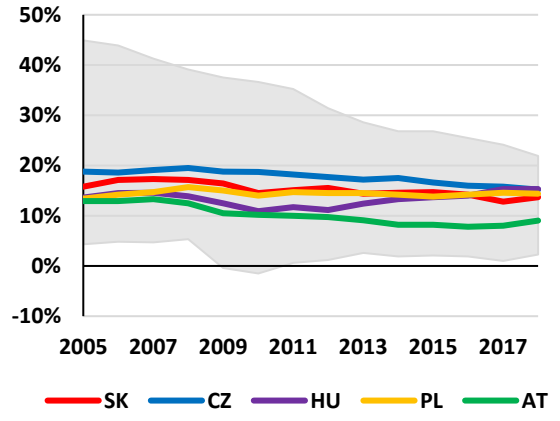


Source: SO SR.

In addition to regional disparities, differences in labor market outcomes between men and women are also important. Strengthening gender equality requires in particular the strengthening of job opportunities available to mothers. Figure 4.27 shows that V4 countries have long been just above the EU-28 average in terms of the gender employment gap. Slovakia is one of the OECD countries with lowest participation rates of mothers with a youngest child aged 0-2 in the labor market. Similarly, Slovakia, together with the Czechia and Austria, is one of the EU countries with the largest gender pay gap (Figure 4.28). Rizman (2017) notes that while motherhood is associated with a drop in wages (by 0.7 p.p. for each child and 0.3 p.p. for each year on parental leave), fathers enjoy an increase in pay. OECD (2019d) warns that the way family policy is presently set in Slovakia leads to mothers staying at home and caring for children up to the age of three, penalizing them in the labor market. Although the popularity of paternity leave is increasing, the subsequent parental leave is mainly used by mothers.

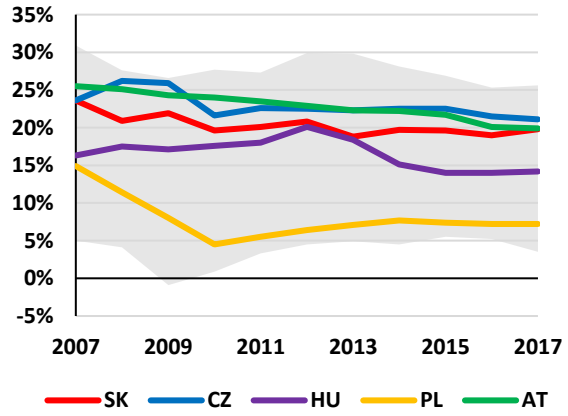
Improving childcare infrastructure could also help increase mothers' participation in the labor market. OECD (2019d) points out that employers do not offer sufficient opportunities to balance work with the care of a small child. This means, on the one hand, a lack of opportunities for more flexible work arrangements and the lack of childcare facilities on the other. Hidas and Horváthová (2018) therefore propose finding incentives that would help make the work of mothers more flexible and support the construction of quality and affordable childcare facilities based on regional needs. Another possibility for increasing mothers' participation in the labor market is the so-called "paternity quota". This is the part of the parental leave, which is reserved for fathers and is not transferable to mothers if they do not exercise their right to it. According to OECD (2016c), the introduction of a paternity quota has led to a doubling in the number of fathers' days on parental leave in the Nordic States, while the ratio of men to the total number of parents on parental leave tripled in the Republic of Korea.

Figure 4.27: Gender employment gap (in p.p.)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole.

Figure 4.28: Gender wage gap (in %)



Source: Eurostat.

Note: The gray band captures the range of values recorded in the EU as a whole.

5 Institutional quality and the business environment

The main determinants of productivity include investment, science and research, innovations and human capital - all topics we have discussed in the previous chapters. Yet, these do not explain all of the variation. Recent research shows the existence of other factors explaining the differences in productivity between countries such as social capital (Beugelsdijk and van Schaik, 2005) and institutional quality (Kaasa, 2016). Social capital is composed of several dimensions affecting productivity: trust in government institutions, citizens' participation in public affairs, as well as the creation of informal and formal networks. These increase the absorption capacity of the economy, which is very important for productivity growth (Kaasa, 2016). Literature distinguishes between short, medium and long-term determinants affecting productivity growth. Long-term, or so-called in-depth, determinants include integration through trade, institutions and geography (Isaksson, 2007). The medium- and short-term factors include those discussed in previous chapters. However, these cannot be effective without the solid foundations given by quality institutions.

Institutional quality is a broad and multidimensional concept that is difficult to define precisely. It includes areas such as law enforcement, individual rights, and the quality of governance. Institutional quality and economic development are closely interrelated. Countries with a better level of institutions are able to adopt new technologies more quickly, which is dependent upon their absorption capacity and thus their ability to increase productivity. Hence, institutional quality is the best indicator of structural development and long-term prosperity of a society (Bruinshoofd, 2016). In terms of the link between institutions and productivity, the most significant outcomes of developed institutions include reduced transaction costs as a result of property rights and law enforcement, the ability of firms to improve their technology and reduction in monitoring costs (Kaasa, 2016). As early as 1999, Hall and Jones showed that differences in physical capital and educational attainment can account for only a relatively small proportion of the existing differences in production per worker between developed and developing countries. Much of the variation in productivity remained unexplained. At a deeper level, Hall and Jones have documented that differences in capital accumulation, productivity, and hence output per worker, are due to differences in the quality of institutions and government policies, collectively called social infrastructure.

In this chapter, we look at a number of indicators of institutional quality, the level of corruption that destroys trust in institutions, law enforcement and the speed of administrative procedures, from where we move onto examine the business environment— a topic closely related to institutional quality.

5.1 Public administration and trust in institutions

From international comparisons of Slovakia's competitiveness vis-à-vis the V4 and EU-28 countries, we saw that Slovakia’s position has deteriorated in recent years. This unfavorable development is partly due to the lack of reforms to improve institutions, business environment and the public administration, allowing other countries to gain competitive advantage over Slovakia (NBS, 2018).

The World Bank looks at the quality of public institutions through its Worldwide Governance Indicators consisting of six pillars listed in Table 5.1. We can see that Slovakia had the worst score in its capacity

to control corruption and rule of law. Overall, Slovakia lags far behind the Czechia and Austria, reaching similar values to Hungary and Poland. Institutional quality assessment is also part of Moody's country ratings, where the Worldwide Governance Indicators receives much attention. Slovakia is currently assigned an A2 rating, which it has held since 2012. In contrast, Czechia has improved its rating this year from A1 to Aa3. According to Moody's, the biggest challenge Slovakia faces is the sustainability of competitiveness and aging population. Moreover, the Corruption Perception Index (Table 5.2) is also taken into account. According to the European Anti-Fraud Office (OLAF, 2018), there is a high incidence of irregularities in the use of EU funds in Slovakia. This diminishes the above-mentioned ability of European funds to increase competitiveness in the areas of research, innovation but also others vital areas.

The trust of Slovak citizens in institutions representing the government is low. The Eurobarometer surveys conducted semi-annually by the European Commission monitors the sentiment prevailing in EU member states. According to the spring survey of 2019, 64% of respondents do not trust the National Council of the Slovak Republic (the parliament) and 65% do not trust the government. Distrust in institutions in Slovakia exceeds the EU-28 average by 4 percentage points in both cases. At the same time, Slovak citizens are more confident in EU institutions, probably because of the more developed social infrastructure at the Union level: only 46% of the respondents have expressed distrust of the EU. At the same time, 72% said that the greatest benefit of EU membership was the free movement of people, goods and services within the common block.

The European Commission (2019) also points out that the institutional weaknesses, identified by citizens, are predominantly directed at criticizing the social system. From the perspective of an average Slovak, rising living costs (37% of respondents) and healthcare and social security (36% of respondents) are the most serious problems in Slovakia and significantly exceed the corresponding EU-28 average (21%).

Table 5.1: Worldwide Governance Indicators

		Institutional quality (- 2,5 ; + 2,5)				Percentile			
		2003	2008	2013	2018	2003	2008	2013	2018
Control of corruption	SK	0.31	0.36	0.08	0.36	65.15	67.48	60.66	66.35
	CZ	0.51	0.36	0.23	0.5	72.22	66.99	63.51	69.23
	HU	0.68	0.47	0.32	0.05	75.76	70.87	65.88	59.62
	PL	0.42	0.46	0.6	0.64	71.72	69.9	71.09	74.52
	AT	2.02	1.84	1.55	1.60	94.95	93.69	91.00	91.35
Government effectiveness	SK	0.71	0.86	0.79	0.71	74.49	77.67	73.93	75.48
	CZ	0.9	1.01	0.89	0.92	79.08	79.61	76.78	78.37
	HU	0.96	0.71	0.65	0.49	81.12	75.24	70.62	70.19
	PL	0.55	0.47	0.72	0.66	71.94	67.48	72.51	75
	AT	2.00	1.78	1.59	1.45	97.45	94.66	92.89	90.87
Political stability and absence of violence	SK	0.95	1.08	1.12	0.75	79.4	87.02	89.1	72.38
	CZ	0.89	1.05	1.08	1.04	76.88	85.58	87.68	87.14
	HU	1.13	0.75	0.80	0.76	86.43	71.15	70.62	73.33
	PL	0.58	0.91	0.97	0.55	64.82	77.88	81.52	65.71
	AT	0.96	1.34	1.36	0.92	80.4	98.56	96.21	80.95
Regulatory quality	SK	0.97	1.12	0.93	0.81	78.57	82.52	78.67	75.96
	CZ	1.20	1.16	1.09	1.26	84.18	84.95	81.52	87.02
	HU	1.12	1.20	0.91	0.60	82.14	85.92	77.73	73.08
	PL	0.74	0.83	1.05	0.88	73.47	75.24	81.04	78.37
	AT	1.57	1.61	1.49	1.54	92.35	94.17	91.47	91.35
Rule of law	SK	0.36	0.59	0.48	0.53	64.36	68.75	64.79	70.19
	CZ	0.87	0.91	1.04	1.05	78.71	80.77	82.63	81.73
	HU	0.93	0.93	0.58	0.56	79.21	81.25	67.61	72.12
	PL	0.56	0.55	0.82	0.43	67.33	66.83	73.71	66.83
	AT	1.89	1.92	1.85	1.88	96.53	98.56	97.65	97.6
Voice and accountability	SK	0.93	0.94	0.96	0.88	74.63	74.04	76.53	76.85
	CZ	1.01	1.03	0.98	0.93	79.6	81.73	77.93	78.33
	HU	1.17	0.97	0.74	0.32	87.06	76.44	70.42	58.62
	PL	1.01	0.95	1.00	0.72	79.1	75.96	79.34	71.92
	AT	1.34	1.36	1.46	1.38	91.54	94.23	95.77	93.1

Source: World Bank.

5.2 Corruption

Unsurprisingly, the generally accepted consensus is that corruption is a negative force that slows economic growth, disrupts investment levels in the country and hinders the development of the financial sector (e.g. Mauro, 1995; Meón and Sekkat, 2005; Cooray and Schneider, 2018). De Rosa et al. (2015) , state that in Central and Eastern European countries characterized by widespread corruption and a weak judicial system, the rate of "bribery tax" imposed on companies by public employees hampers business-level productivity. Likewise, Mo (2001) indicates that a 1% increase in the level of corruption in the country is associated with a 0.72% reduction in economic growth. The primary reason for this slowdown is the political instability that corruption brings, responsible for 53% of the overall effect.

However, there is also a small number of studies arguing for the positive impact that corruption can have on economic activity (e.g. Leys, 1965; Bardhan, 1997). These authors suggest that in an environment of complex administration, bribes can increase processing speed and allow businesses to bypass bureaucratic processes. However, this view of corruption as a grease in the wheels of productivity and growth is based on the premise that government bureaucracy is inefficient - if effective public governance can be achieved, the positive impact of corruption is lost. Consequently, empirical research largely supports the majority hypothesis: the increased rate of corruption adversely affects the economy and the fight against corruption cannot be abandoned.

Given the illegal nature of corrupt behavior, measuring corruption in any reliable manner proves difficult. The number of convicted persons for corruption in Slovakia is highly volatile during the period considered, and it is difficult to draw conclusions about the prevalence of corruption in Slovakia on the basis of this indicator alone. In Slovakia, 73 people were convicted for corruption in 2017. This is half the value of what was recorded in 2010, when 152 people were convicted (Figure 5.1). Yet, the low number of convictions may indicate either a low level of corruption, institutional deficiencies in the prosecution of economic crimes, or it may also indicate that corruption affects all levels of public administration and rule of law institutions.

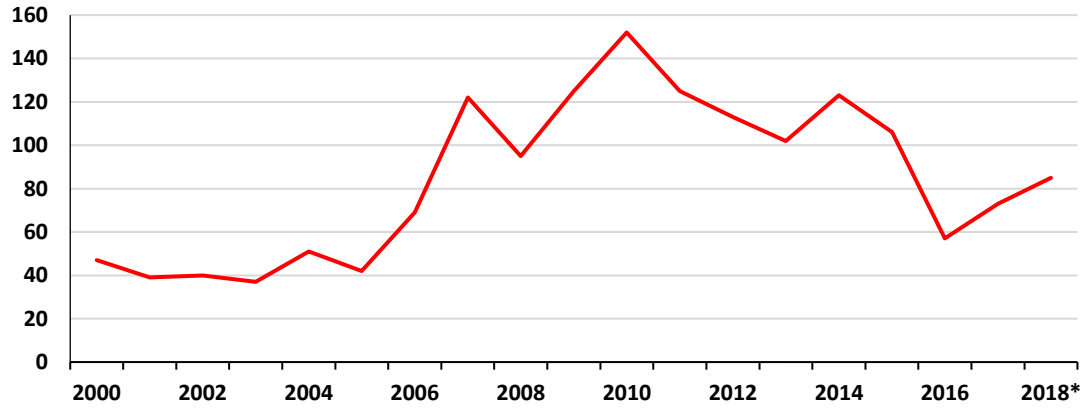
Due to these shortcomings in measuring corruption, the Corrupution Perception Index (CPI) published annually by Transparency International instead evaluates and classifies countries on the basis of the perception of the population as to how widespread they believe corruption is in the public sector of their country. While the subjective perception of the population and the actual level of corruption in the state may naturally vary to a considerable extent, the CPI can be taken as an informative indicator in terms of political stability or institutional trust. Over the past decade, Slovakia has only seen a slight improvement and subsequently a decline in its CPI score, reflecting the recent events in the country (Table 5.2). Today, Slovakia is one of the countries moderately marked by corruption, ranking 59th in the ranking of 180 countries from the the cleanest to most corrupt. While the V4 countries rank similarly in the CPI ranking, from the perspective of the EU as a whole, where the average score is significantly higher (66 points in 2019 against 50 in Slovakia), the integrity of Slovak institutions becomes more questionable. In addition, Transparency International Slovakia (2020) notes that according to a recent survey in 2019, 37.5% of respondents in Slovakia identified corruption as one of the most serious social problems faced by our society. This is more than double the value in 2004, where only 18 % of respondents saw corruption as the most serious societal problem. These values are in line with the trend seen in the number of convictions (Figure 5.1).

Table 5.2: Corruption Perception Index

		2012	2013	2014	2015	2016	2017	2018	2019
Score (scale of 0 - 100)	**SK**	46	47	50	51	51	50	50	50
	CZ	49	48	51	56	55	57	59	56
	HU	55	54	54	51	48	45	46	44
	PL	58	60	61	63	62	60	60	58
	AT	69	69	72	76	75	75	76	77
Ranking (1 = lowest level of perceived corruption)	**SK**	62	61	54	50	54	54	57	59
	CZ	54	57	53	38	47	42	38	44
	HU	46	47	48	50	57	66	64	70
	PL	41	38	36	29	29	36	36	41
	AT	25	26	23	16	17	16	14	12

Source: CPI, Transparency International.
Note: Higher score suggests lower level of perceived corruption.

Figure 5.1: Number of convictions for corruption-related crimes



Source: Ministry of justice of the Slovak Republic.
Note: The datapoint from 2018 is not comparable with other datapoints, as there was a change in the methodology of data reporting for criminal agenda and criminal agenda data collection has been revised.

5.3 Judiciary

An effective justice system is a key determinant of inclusive growth, political and economic stability, as well as the standard of living in a country. According to OECD (2020b), countries with a sound legal system report a higher level of GDP per capita and are more internationally competitive. Limited access to justice results in a country's weakened competitiveness, as it becomes difficult to attract foreign investors and to stimulate entrepreneurial activity in an environment characterized by constant uncertainty in law enforcement.

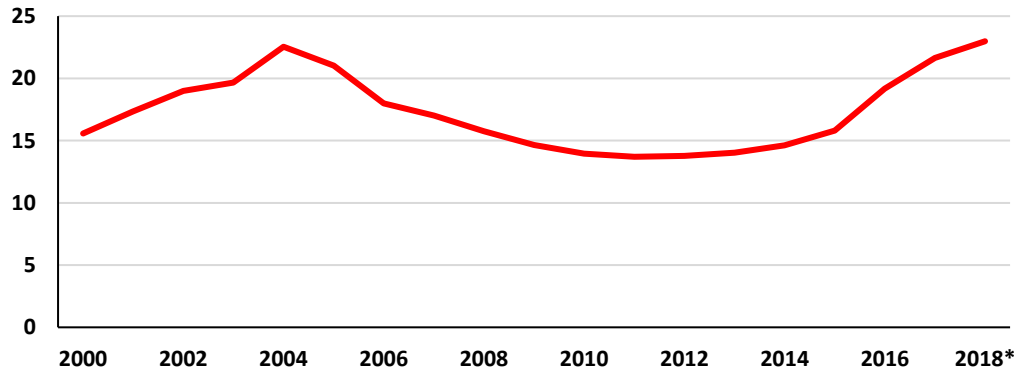
In this context, it is rather distressing that Slovakia ranks among the countries with the least confidence in the judiciary within the EU-28 — 64% of firms in Slovakia do not trust the justice system (European

Commission, 2018). At the same time, 40% of surveyed firms believe the independence of judges and the judiciary is in a bad state and 24% believe it is in a very bad state. Stronger distrust within the EU is only reported in Croatia and Italy. By contrast, the average level of mistrust in the EU-28 was 39%, with only 6% of businesses expressing distrust in Denmark.[27] The primary reason behind the widespread mistrust in the rule of law is the strong perceived influence of political and economic subjects on the judiciary. Furthermore, Spac et al. (2018) state that the positive impacts of the reforms which aimed to increase the transparency of the Slovak judiciary were at best partial. According to their study, the speed of ruling has accelerated by 10% in the first years following the reform. However, public confidence was not regained and the share of new judges with existing family bonds in the judiciary has not been reduced despite the efforts to increase the transparency of selection procedures.

Duration of commercial proceedings

In Slovakia, commercial court proceedings take almost 23 months on average (Figure 5.2). This is the average length of lawfully filed cases in the district courts for which a statistical sheet is drawn up.[28] The length of court proceedings is also contingent upon the workload of judges and their productivity. Following the recession, the overarching objective within the public sector was to do more using fewer resources. Consequently, in 2017, an evaluation of the efficiency and quality of the Slovak judicial system was carried out. One of the recommendations stemming from the evaluation was to increase the productivity of the courts so that judges could primarily concentrate on cases requiring the highest legal expertise, with matters related to land or commercial register, guardianship, family law, heritage, etc. could be transferred to legal officers (CEPEJ, 2017). Another recommendation for the future is the specialization of courts and judges, as well as court officials. The expected benefit stemming from such a reform is the more efficient allocation of staff based on specialization, which should lead to higher productivity and quality of support services. At the same time, significant differences between the productivity of judges were identifiedraising the question of the effectiveness of the institutions.

Figure 5.2: Length of legal proceedings—commercial proceedings (in months)



Source: Ministry of justice of the Sloval Republic.

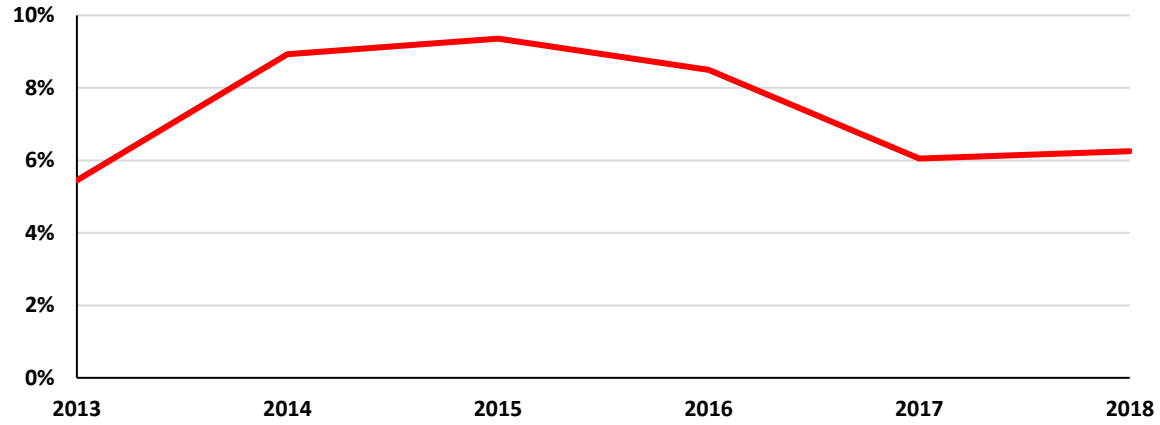
[27] Share of those who see the situation to be bad or very bad.

[28] A statistical sheet is not drawn up for all concluded cases, meaning the reported length of proceedings do not cover the full range of all registries falling under the given agenda. The average length of commercial proceedings in 2018 also includes cases with international aspects (up to 2017, cases with international aspects were not included)

Appeals in commercial matters

If we look at the share of appeals in commercial matters, we can see that at the level of regional courts, where appeals are made against the decisions of district courts, the rate of appeals (which we measure as the ratio of decisions against which appeals were filed againstthe decisions of the court of first instance in commercial cases) was 6.25 % in 2018 (Figure 5.3). As can be seen, there is a decrease compared to previous years, which is a positive development.

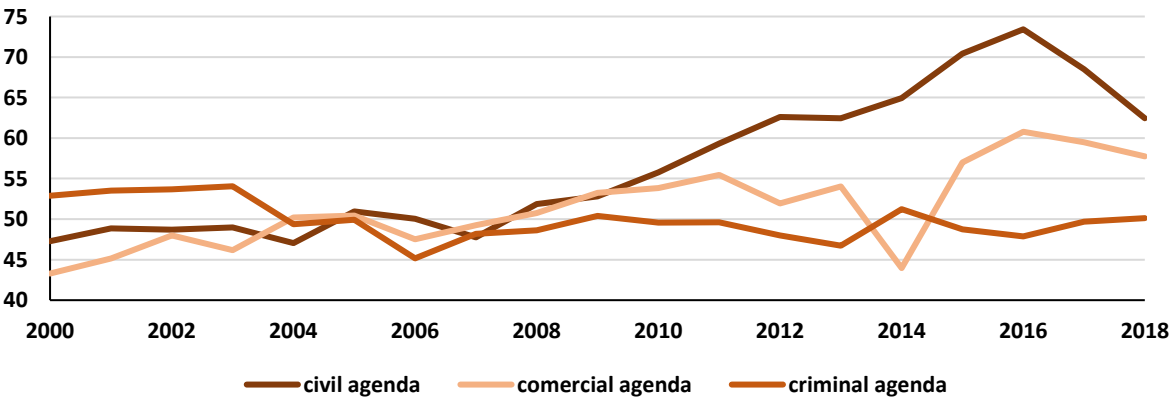
Figure 5.3: Rate of appeals in commercial matters (in %)



Source: Ministry of justice of the Sloval Republic.

62.46% of appeals were successful in the civil law agenda in 2018 (Figure 5.4) from the perspective of the district court— i.e. the decision of the court of first instance was upheld by the second instance decision. However, this is a full 10 percentage points less than in 2016, indicating a downward trend in supporting the district court's decision. A successful appeal is interpreted as the confirmation of the decision of the district court by the regional courts (including cases in which the parties involved in the appeal proceedings have settled and cases in which they withdrew the appeal). The measure considered for criminal agenda is the number of persons processed for appeals. This data suggests a concerningly high proportion of district court decisions not confirmed by the regional court. In practice, this means that half of the district court's decisions in criminal cases against which an appeal was made were not supported by the regional court.

Figure 5.4: Share of successful appeals– various agendas



Source: Ministry of justice of the Sloval Republic.

5.4 Business environment

The business environment can be seen as a reflection of the quality of institutions and economic conditions in the country (Conorto et al., 2014). A favorable institutional environment, effective and fair regulations, as well as a dynamic layer of small and medium-sized enterprises, are the driving force for business activity and innovation, stimulating the potential for economic growth (OECD, 2018b). Lasagni et al. (2015) tested the impact of the quality of local institutions on business productivity in Italy, confirming that better local institutions are indeed making businesses more productive. OECD (2018b) also warns that a large number of countries, including Slovakia, are still characterized by complex regulations, costly administrative procedures and inefficient liquidation procedures, hindering business initiatives and resulting innovations.

Formal market entry barriers

The aggregate productivity of the economy consists of the productivity of individual firms. A favorable environment for starting and growing one's business is therefore a fundamental prerequisite for a productive economy. The lower the barriers to entry for new businesses, the more existing businesses are under pressure to streamline their production, increase quality or reduce costs. The ease with which firms can enter and exit the market enables a dynamic process of replacing inefficient firms with more efficient ones, until only the strongest players remain. Such a mechanism contributes positively to the overall productivity of the economy.

According to the aforementioned World Bank's Doing Business, the bureaucracy involved in setting up a new business in Slovakia is well above the EU-28 average, both in terms of steps and days (Table 5.3). However, the costs associated with setting up a new business are the lowest in the region. It is thus evident that the persisting institutional barriers to entrepreneurship in Slovakia are restrictive primarily due to their complexity, not cost.

Table 5.3: Administrative procedures required for setting up a new business (2020)

	Slovakia	Czechia	Hungary	Poland	Austria	EU-28
Necessary administrative steps	7	9	6	5	8	5.3
Time (days)	21.5	24.5	7.0	37.0	21.0	11.9
Costs (% of income per capita)	1	1.1	4.5	11.6	4.7	3.1

Source: Doing Business, World Bank.

The relatively unfavorable regulatory setting of the Slovak business environment is also reflected in OECD's product market regulation indicators, which measure barriers to market entry and the intensity of competition. Slovakia is worst off among neighboring countries and below the OECD average in this aspect. The most problematic are the areas of state-owned enterprises, the administrative burden on start-ups, as well as institutional barriers in the services or ICT sectors (Table 5.4).

The life span of start-ups is generally relatively short and most of young businesses remain relatively small in size (Decker et al., 2014). Low-productivity young firms are forced to exit the market, while productive ones expand rapidly. Decker et al. (ibid.) emphasize that these few successful fast-growing startups play a critical role in innovation and do more than offset the job losses stemming from failed start-ups, as they end up making a significant contribution to job creation. An excessively high administrative burden on startups, combined with barriers in innovative service and ICT sectors, hamper entrepreneurial activity and drag down the productivity of the whole economy.

Table 5.4: Product market regulation indicators

		Slovakia	Czechia	Hungary	Poland	Austria	OECD average
Product market regulation		**1.52**	**1.31**	**1.34**	**1.45**	**1.47**	**1.40**
Of which:							
Distortions induced by state involvement	Public ownership	2.19	1.60	2.07	2.98	1.78	2.15
	Involvement in business operations	0.96	1.17	0.83	1.23	1.24	1.29
	Regulations	1.48	1.34	1.95	0.77	2.14	1.50
Barriers to domestic and foreign entry	Administrative barrier on startups	2.17	1.72	0.63	1.20	0.94	1.06
	Barriers in service and network sectors	1.85	1.45	1.92	1.97	2.04	1.75
	Barriers to trade and investment	0.48	0.56	0.64	0.55	0.71	0.67

Source: OECD.
Note: Values for 2018. Higher numbers mean a less favorable business environment. The worse the result, the warmer the color with which the value is highlighted.

New enterprises

Despite non-negligible administrative obstacles, the number of new business initiatives in Slovakia is relatively significant. Eurostat's measure of enterprise births captures the ratio of enterprises established in a given year to the total number of active enterprises. It is an evaluation of enterprise births according to the methodology of enterprise demography in sectors B-N except for K642 according to the statistical classification of economic activities. In this respect, Slovakia is above the EU-28 average, and in 2017, with 13.67% of all active Slovak enterprises in those sectors established in that year (Figure 5.5). At the same time, it can be seen that the establishment of new enterprises in Slovakia constantly exceeds the death rate of existing enterprises (Table 5.5). Thus, the population of active enterprises is gradually growing, indicating an increased potential for enhanced competition between enterprises.

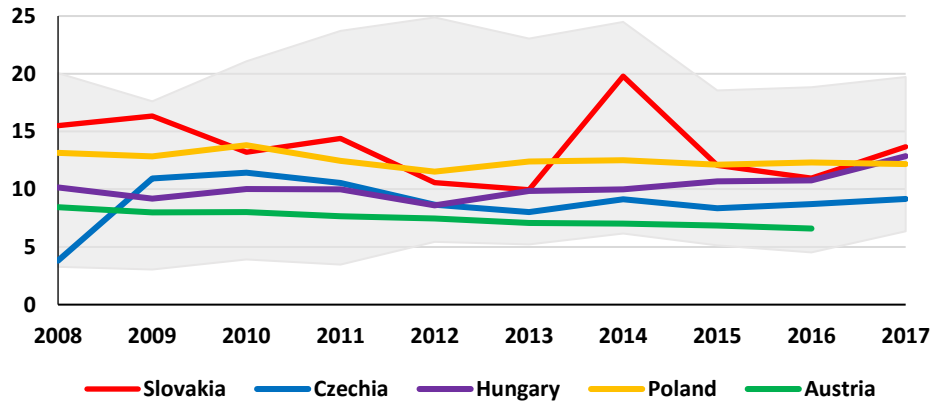
Peciar and Wittemann (2019), however, warn that the Slovak economy is characterized by the predominance of non-productive micro-firms. According to the authors, these micro-enterprises represent 91% of all Slovak firms, yet in terms of added value only contribute about 14%. Given that consolidation allows cost savings resulting from economies of scale, the dispersion of capital or labor into unproductive micro-firms may be preventing the Slovak economy from reaching its potential. Thus, the growing population of active enterprises may conversely indicate an exacerbation of the unfavorable allocation of factors of production into small unproductive units.

Table 5.5: Enterprise births and deaths in Slovakia (% of active enterprises B-N, except K642)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Births	15.51	16.34	13.19	14.39	10.58	9.95	19.79	12.07	10.96	13.67
Deaths	11.38	10.57	7.19	14.17	9.25	12.67	10.37	9.21	9.93	11.08
Net	4.13	5.77	6	0.22	1.33	-2.72	9.42	2.86	1.03	2.59

Source: Eurostat.

Figure 5.5: Enterprise births (% of active enterprises B-N, except K642)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The range does not include complete time series for Croatia, Greece, Ireland and Malta. Data for Austria is only available up to 2016.

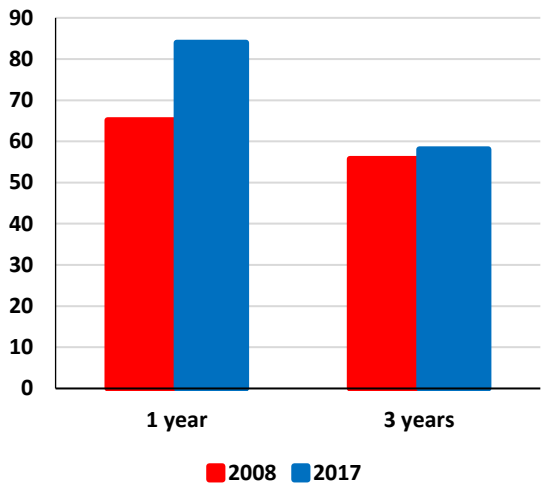
While the share of new enterprises in the population of active enterprises exceeds the level of neighboring states, the probability of survival of these firms is at a comparable level (Figure 5.8). At the same time, it is noteworthy that more businesses now survive their first year than they did in the past (Figure 5.6). The share of companies that survived the first year after establishment increased by 18.75 p.p. between 2008 (survival from 2007 to 2008) and 2017 (survival from 2016 to 2017). However, the probability of surviving 3 years following establishment remains largely unchanged from 2008, with the share of companies surviving for 3 years (survival from 2005 to 2008, and from 2014 to 2017, respectively) recorded an increase of 2.3 p.p. only. On the one hand, the relatively low life span of newly created enterprises may indicate the non-competitiveness of young enterprises. On the other hand, OECD (2019a) emphasizes that barriers to market exit are at least as harmful to market competition as barriers to entry, as they hinder the mobility of human and physical capital into more productive segments. Dynamism in the exit of inefficient firms from the market thus cannot be seen as a purely negative phenomenon, as it allows for the re-allocation of resources to faster-growing firms or sectors.

Fast growing enterprises

In their empirical study, Du and Temouri (2015) have identified that firms experiencing faster growth in total factor productivity (TFP) are also often characterized by rapid business growth. The authors also state that the rapid growth of a company usually leads to accelerated TFP growth. The link between TFP growth and business-level growth is relatively intuitive. Academic literature repeatedly

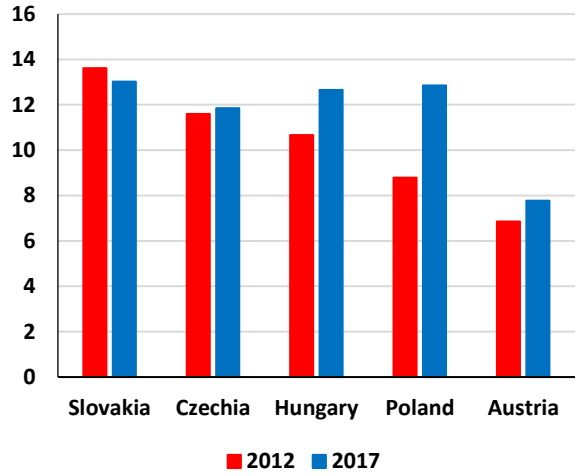
points to the fact that fast-growing businesses stand out in many important firm-level productivity determinants: better managerial skills, skilled human capital, innovation capacity and a high R&D focus. The population of fast-growing companies thus positively contributes to the competitiveness of the economy.

Figure 5.6: Enterprise survival in Slovakia (%)



Source: Eurostat.

Figure 5.7: Share of fast growing enterprises (growth in the number of employees, % of active enterprises)

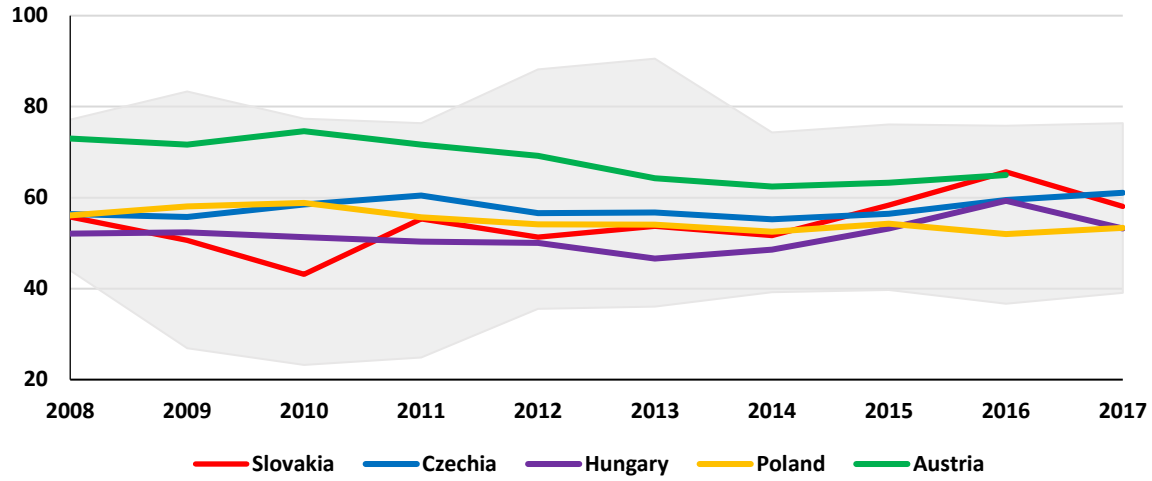


Source: Eurostat.

Note: Fast growing enterprises are defined as ones whose yearly growth rate in the number of employees exceeds 10 % in three consecutive years, and the firm must have at least 10 employees in the starting year.

In this context, it is a positive phenomenon that Slovakia has the largest share of fast-growing businesses among neighboring countries, both in 2012 (growth in 2010-2012) and in 2017 (growth in 2015-2017), despite a smaller decline of 0.59 p.p. in these years (Figure 5.7). This is based on the assessment of fast-growing enterprises measured by employment, determined by the methodology of enterprise demography in sectors B-N except K642 of the statistical classification of economic activities. At the same time, it can be seen that the V4 economies generally provide more room for business growth than the more developed Austria, which positively contributes to the convergence of less developed economies to richer ones, and reflects the ongoing transformation of these economies.

Figure 5.8: Survival of new enterprises (3 years, in %)



Source: Eurostat.
Note: The gray band captures the range of values recorded in the EU as a whole. The range excludes Croatia, Greece, Cyprus, Malta and Ireland due to data unavailability. Data for Austria is only available up to 2016.

Conclusion: Challenges for Slovakia and Slovak policymakers

Today, Slovakia is a member of the European Union, NATO and OECD, and is seen by the World Bank as a high-income economy. The economic transformation seen over the past thirty years following the end of Communism and central planning has been successful and has borne fruit by modernizing the economy and significantly improving living standards. Taking price levels into account, the average Slovak is now richer than the average Greek or Portuguese.

These achievements primarily built on cheap and skilled workforce, favorable geographical location and a social consensus to undertake the necessary economic and political reforms. Together, these factors have made Slovakia an attractive destination for foreign capital (for details, see section 3.2). Thanks to the abundance of FDI inflows in the period prior to the Great Recession, Slovakia was one of the fastest growing EU economies. It has become an automotive superpower (in per capita terms), a popular offshoring destination for service and administrative centers of foreign enterprises, and an assembly plant for a wide range of multinational industrial companies. After the Great Recession, the economy did not regain its strength and convergence to the level of the more developed EU countries slowed down.

The first Report on productivity and competitiveness of the Slovak Republic identifies several warning signals. Labor productivity growth is slowing down, without growth of labor costs following suit (Section 2.1 and Section 2.2). If this does not change, it will lead to a gradual loss of price competitiveness. The state of infrastructure lags significantly behind similar countries (section 3.3), as does investment (section 3.1). The level of corruption in Slovakia is at an unacceptably high level (section 5.2). Last but not least, the Slovak population is aging and birth rates are at extremely low levels. The continuation of this trend may further slow labor productivity growth and pose a threat to the sustainability of public finances.

The successes of the Slovak economy so far have represented low-hanging fruit. In order to reach for the fruit on higher branches, we now need ambitious changes and reforms. Without them, Slovakia runs the risk of being caught in the middle-income trap. Based on the analyses presented in this Report, we have identified three key areas in which we see the greatest challenge for economic policy facing the new Slovak government: education and labor, infrastructure, and the quality of institutions.

In order to have a skilled and highly productive workforce, it is necessary to constantly invest in education, including pre-school care. Slovakia is lagging behind in this direction (section 4.3). This largely reflects the dichotomy in education, where children from poor and Roma families achieve significantly worse results than children from the majority population (section 4.1). Investment in pre-school care and in improving the quality of schools in poor and marginalized communities has the potential to generate high returns in terms of future workforce quality. Further lowering the age for compulsory pre-school education, increasing the involvement of support staff, using community centers to support children outside of school hours and reducing grade retention are all steps in the right direction in this area. It is also necessary to improve the employability of members of disadvantaged groups, which will require abandoning the prejudices that the majority society continues to hold against Slovaks of Roma or other minority origins. Early identification of people at risk of long-term unemployment and making effective labor market measures widely available can further reduce the risk of productivity losses in this segment of the workforce. Last but not least, the Slovak economy is currently facing a labor shortage in Western Slovakia, but at the same time is

struggling with high unemployment in Eastern and South-Eastern Slovakia (Figures 4.23 - 4.25). It is therefore necessary to improve the spatial allocation of the labor force across the national labor market, so that the unemployed can access employment opportunities or the jobs can come to them. In this respect, it would also help to ensure a higher participation of the cohort in their 60s, either by increasing the retirement age or by increasing the incentive to work voluntarily beyond the retirement age. At present, significantly more Slovaks work abroad than foreigners do in our economy: to maintain high growth potential of the Slovak economy going forward and to fill labor market gaps, we must stop and reverse brain drain, attract Slovaks living abroad back, and simplify existing regulation for employing people from third countries.

It is not possible to build high-quality education and a highly skilled workforce without excellent universities and scientific institutions. The low quality of universities is the reason why Slovakia is largely lags behind in terms of research and development, why we are merely the “assembly plant” of global value chains and why we do not have sufficiently high value-added activities in our country. We must not neglect the support (including financial support) of science and research and overall scientific and technological progress. At the same time, this support must motivate universities to improve the quality of their output: it is necessary to stop supporting low-quality universities and sub-standard research and focus on supporting the best research teams with an above-average impact.

The completion of transport infrastructure will also help in reducing regional disparities in the labor market (section 3.3): Slovakia lags behind neighboring and similar countries in terms of both quality and pace of road network construction. A positive example may be the Nitra region, where unemployment started to decline from its originally high level after transport infrastructure in the region has improved. Similarly, the experience to date has shown that most foreign investment went to regions with high-quality transport infrastructure. Slovakia falls behind not only in terms of transport infrastructure, but also in terms of communication infrastructure. In addition, we are heavily reliant on European funds in our infrastructure investment (section 3.4). At the same time, there scope for improvement in the rate and efficiency of ESIF spending in most key areas. Slovakia also needs to be prepared to invest its own resources: contributions from the EU budget will not be unlimited.

The poor quality of institutions, the ineffective justice system and the high level of corruption (Chapter 5) reduce firm productivity and increase uncertainty as well as transaction costs. In order for Slovakia to continue to grow at a high pace in the future, this area too, leaves significant room for improvement. Slovakia’s standing has long been deteriorating in rankings of competitiveness and business environment: the conditions for doing business must be more favorable in order to motivate and attract entrepreneurial activity both from Slovakia and abroad. The justice system must be made transparent and effective: the courts must make decisions in a predictable, timely and transparent manner. The judiciary must be subject to constant public scrutiny at all levels. There is a continuous need for increased efficiency of public administration, and the reduction of administrative burden on businesses and the population needs greater attention. In this context, the continuation of the Value for Money project and a consistent application of the recommendations of their spending reviews is crucial. Corrupt and unethical behavior, at any level, is unacceptable and must be adequately penalized.

Slovakia currently stands on the threshold of a great public health and economic crisis brought about by the COVID-19 pandemic. Fighting the epidemic, along with its economic, social and health consequences will present a significant burden on this year's Slovak budget. Slovak public finances are

in good condition, especially compared to other European countries. It will be crucial to do everything in the state's power to ensure that the consequences of the crisis are as moderate as possible and that the Slovak economy does not fall into a deep and lengthy recession. After the COVID-19 outbreak, the long-term sustainability of public finances will need to be restored, for example by cutting costs arising from the pension system (possibly requiring the abolition of the pension ceiling and the 13th pension), improving the state's tax collection capacity and reducing non-investment expenditure.

Slovakia has achieved significant successes thus far. It will require substantial effort and determination to sustain this trend. The National Productivity Board supports the broad application of evidence-based economic and social policy making rather than adoption of policies motivated by ideological preferences or political objectives. The choice of specific measures within the identified three areas (education and labor, coupled with research and innovation, infrastructure, and quality of institutions) will require a detailed analysis of the benefits and impacts of alternative measures. The National Productivity Board is prepard to partake in such analyses and looks forward to a productive cooperation with the new government of the Slovak Republic.

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