Structural Challenges

2021

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Address

Národná banka Slovenska
Imricha Karvaša 1
813 25 Bratislava
info@nbs.sk

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Abbreviations

AMECO	The annual macroeconomic database of the European Commission's Directorate General for Economic and Financial Affairs
BMI	body mass index
BPM6	The sixth edition of the IMF's Balance of Payments and International Investment Position Manual
CO2	carbon dioxide
CT	computer tomography
DG ECFIN	The European Commission's Directorate-General for Economic and Financial Affairs
EC	European Commission
ECB	European Central Bank
EFSF	European Financial Stability Facility
EFSM	European Financial Stabilisation Mechanism
EIS	European innovation scoreboard
ESM	European Stability Mechanism
EU	European Union
FDI	foreign direct investment
FRA	European Union Agency for Fundamental Rights
GEM	Global Entrepreneurship Monitor
GDP	gross domestic product
IEP	Institute for Environmental Policy of Slovakia's Ministry of Environment
IFP	Institute for Financial Policy of Slovakia's Ministry of Finance
IFR	International Federation of Robotics
ICT	information and communications technology
IMF	International Monetary Fund
MRCs	marginalised Roma communities
MRI	magnetic resonance imaging
NBS	Národná banka Slovenska
OECD	Organisation for Economic Co-operation and Development
OMTs	Outright Monetary Transactions
PISA	Programme for International Student Assessment
PPP	purchasing power parity
PPS	purchasing power standard
PM2.5	particulate matter with diameters of 2.5 microns or less
PM10	particulate matter with diameters of 10 microns or less
PPI	producer price index
QE	quantitative easing
RRP	recovery and resilience plan

TFP	total factor productivity
UNDP	United Nations Development Programme
V4	Visegrad Four (a cultural and political alliance of four countries: Czechia, Hungary, Poland and Slovakia)
WGI	World Governance Index

Symbols used in tables:
. – figure is not yet available
- – figure is not found or does not exist
(p) – preliminary figure

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1 Structural challenges summary

Slovakia has stopped catching up with the European Union's average economic level. Our economy is confronted with a middle-income trap and with several profound challenges that in many cases have been exacerbated by the pandemic crisis. Resuming the path of convergence towards advanced economy living standards will require us to adopt substantial structural reforms. Such reforms would improve the functioning of the Slovak economy in the context of the euro area's single monetary policy.

Slovakia's challenges go beyond the issue of convergence with advanced economies. Our economy must also undergo a green transformation if its further progress is to be compatible with our commitment to achieve climate neutrality by mid-century. In addition, we must respond to the economy's increasing vulnerabilities, in particular to the serious concerns surrounding the sustainability of public finances. Another challenge is to bring Slovaks closer to the European average in terms of health outcomes, which at present are lagging far behind. Another Achilles heel of our economy is the exclusion of marginalised groups from the benefits of economic growth; the challenge is to integrate them into the labour market and eliminate their disadvantages in living standards, education, and health.

To close the economic gaps with advanced economies will require reform efforts targeted at education, the economy's innovation capacity, the business environment, and public institutions. Through the education system – from pre-school to university education and including lifelong learning programmes – and active labour market policies, people must be equipped with the knowledge and skills needed for not only the current labour market, but also the labour market of the future. Achieving this objective will necessitate reforming curricula, improving school infrastructure, making teaching a more attractive career choice and improving the higher education sector (reforming university governance, increasing the internationality of the sector, and boosting the quality and financing of its R&D).

The key to increasing the Slovak economy's potential lies in building up the country's innovation potential, especially in cutting-edge areas: Industry 5.0, the digital economy, artificial intelligence (AI), robotisation, e-mobility, and the hydrogen economy. Reforming and increasing the financing of R&D could bear fruit; making it more international will also be important, as will strengthening its links with the private sector, par-

ticularly in cutting-edge areas. Innovation could be further bolstered by improving the business environment, law enforcement, and the quality of public institutions, including their digitalisation.

Efficient use of the funding available from the EU's Recovery and Resilience Facility (RRF) and structural funds can contribute greatly to greening the economy. Measures and investment are expected to focus on decarbonisation of the industry and energy sectors, on increasing energy efficiency (including the modernisation of public buildings and private homes), and on adapting to climate change. Other important areas include the transition to sustainable transport – through investment in e-mobility, rail and other public transport, and cycle infrastructure – and support for the circular economy. Furthermore, air protection measures should help reduce morbidity and excessive deaths.

The unsustainability of public finances represents a serious vulnerability for the Slovak economy. Once the repercussions of the COVID-19 pandemic have faded, the recovery of public finances must become a priority. Since the population is rapidly ageing, the pension system will need to be reformed, including by restoring the automatic adjustment of the statutory retirement age to life expectancy. The system's sustainability can be further supported by making the retirement age more flexible (with pensions calculated so as to incentivise remaining in the labour market) as well as by increasing the efficiency of saving in the system's second pillar. The long-term sustainability of public finances can be improved by introducing spending caps and by strictly implementing measures resulting from spending review assessments integrated in the budgetary process (the Value for Money project). In the area of general government expenditure, improvements must be made in prioritisation and in the management of public investment. On the revenue side, tax collection can be improved, and part of the tax burden can be shifted from taxation on activity to environmental and wealth taxes.

As regards health outcomes, narrowing the gap between Slovakia and the EU average will require reform of and investment in the health system. The system would achieve better outcomes from existing resources if the measures identified as necessary by the health spending review were implemented. Improvements to the set-up of the hospital network and to hospital management would also help. It is necessary to address the imbalanced age structure of health professionals and shortages of personnel (mainly general practitioners and nurses) and to expand the competencies of general practitioners (GPs) and nurses. The EU's RRF funds and structural funds offer an opportunity to eliminate investment gap in the health sector. It will be crucial, however, to use these funds efficiently and to se-

cure the future resources needed to maintain new and modernised facilities. The improvement of health outcomes can be further supported by completing the digitalisation of the health system and by using modern technology (telemedicine, automation, and artificial intelligence).

As regards reducing inequalities, we are confronted with the challenge of integrating marginalised groups into economic activity and of reducing inequality in living conditions and in opportunities. What can help here is ensuring more efficient and higher spending on active labour market policies, expanding pre-school education, and improving the quality and inclusion of the education system. The labour market participation of women of childbearing age can be supported by targeted family policy instruments, such as increasing the availability of pre-school childcare and offering higher parental leave benefits over a shorter period. There should also be measures to reduce gender gaps in wages and to support equality of opportunity. In the case of the Roma communities, there is the challenge of improving their living conditions and basic infrastructures, their access to health care and their health awareness.

Slovakia's recovery and resilience plan (RRP) for accessing RRF funds represents an unprecedent opportunity to improve quality of life and the economy's innovation potential and to contribute to greening the economy. Its success will be heavily contingent on the specific formulation of reforms and, in particular, on their implementation. Just as important will be the application of Value for Money principles in RRP investments.

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2 Structural challenges from the central bank's perspective

*"The implementation of **structural policies** in euro area countries needs to be substantially stepped up to boost euro area productivity and growth potential, reduce structural unemployment and increase resilience."*

*"In order to reach its full potential, the European Union's Recovery and Resilience Facility will need to be firmly rooted in sound **structural policies** conceived and implemented at the national level. Well-designed structural policies could contribute to a faster, stronger and more uniform recovery from the crisis, thereby **supporting the effectiveness of monetary policy in the euro area**."*

***ECB President Christine Lagarde**, from the introductory statements to the press conferences of 12 December 2019 and 16 July 2020 respectively.*

Slovakia is facing a middle-income trap. Before the pandemic crisis, GDP per person was already stagnating at around 70% of the EU27 average. Today, the crisis and its repercussion are posing new challenges for the economy.

In this situation, talk is increasingly turning to the need for so-called structural reforms, which have a significant impact on the effective functioning of monetary policy. Structural policies are measures of a regulatory and institutional nature whose purpose is to increase long-term income growth, economic resilience, inclusion, and social fairness.

From the central bank's perspective, the impact of such reforms is particularly important in a low interest rate environment and in the context of the common monetary policy. The low level of the equilibrium interest rate is restricting the extent to which the central bank can apply standard instruments in response to adverse economic developments. Structural policies focused on productivity growth and on addressing the negative effects of population ageing can contribute to an increase in equilibrium interest rates.

Structural reforms can make the economy more resilient to shocks in a situation where the country has no independent monetary policy. There may be certain instances where the euro area's common monetary policy

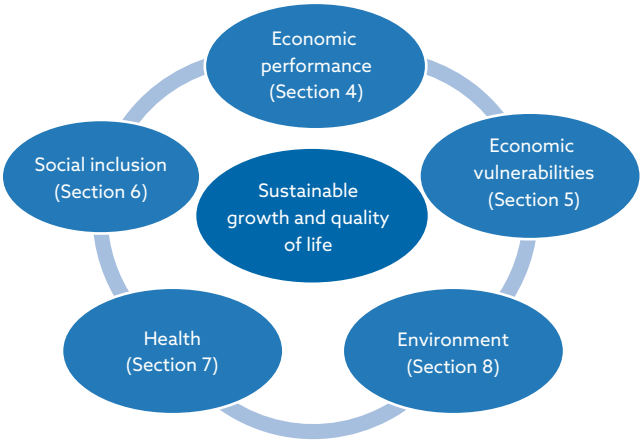
is not able to respond to a specific situation in a particular country. The relationship between structural policies and monetary policy is examined more closely in Annex 2 (Section 10. 2).

Structural Challenges (SC) is an annual publication about structural policies in Slovakia; it describes them and offers a list of solutions, thereby stimulating further debate on this issue. The SC report aims to strengthen the position of Národná banka Slovenska (NBS) in the public discussion about necessary structural reforms. Progress on this front is expected to ensure the resumption of convergence with western Europe, the strengthening of economic resilience, the preparing of the country for future challenges and, not least, the improvement of the economy's functioning in the context of the single monetary policy. Compared with other international and domestic publications covering similar ground (see Box 1), it should stand out for its breadth of coverage, clarity, and focus on addressing key problems.

This first edition of the SC report aims to provide a comprehensive overview of the current state of structural reforms and to identify priority areas in this regard. Subsequent editions are expected to include, in addition to an assessment of progress in key areas, sections devoted to particular topics important for Slovakia. They will also bring new insights from the literature and from the experiences of countries which have had notable success in this or that area, so as to be able to offer an overview of promising solutions that may inspire further public discussion.

The SC report highlights the Slovak economy's structural challenges and vulnerabilities using a coherent analytical framework, the core objective of which is sustainable development and quality of life. In this sense, high quality of life has a number of dimensions:

Figure 1
Quality of life dimensions



In each of these areas, our assessments are made with a set of measurable indicators. Comparisons with other EU and OECD countries are supplemented with a scoreboard of indicators that standardises Slovakia's ranking among other countries and thereby enables a better assessment.[1] The concept and methodology are described in more detail in Annex 1 (Section 10.1).

Education, the economy's innovation capacity, and the business environment are crucial areas in which Slovakia should be aiming to resume convergence with the advanced world. Other major challenges include the following: reconciling living standards convergence with climate neutrality commitments; health; public finance sustainability; and the integration of socially marginalised groups.

Box 1
Publications addressing structural policies in Slovakia

The issue of structural policies in Slovakia is addressed by several international and domestic publications. At the European Union level, structural policy analysis forms part of the European Semester framework. These analyses appear mainly in Country Reports produced by the European Commission (EC)[2] and in EU Council Recommendations for individual countries.[3] Recommendations on structural policies are also made by the International Monetary Fund (IMF) in its Article IV Consultation Staff Reports[4] and by the Organisation for Economic Co-operation and Development in its Economic Survey of Slovakia[5] and in the Reform Priorities section of its Going for Growth report.[6]

At the national level in Slovakia there are two publications on this issue. The National Reform Programme[7] is produced annually by the Ministry of Finance within the European Semester framework. It summarises the outlook for structural reforms and describes measures adopted in response to EU Recommendations. In April 2020 the first Report on Productivity

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1 Where a lower indicator score denotes a better outcome for the given country, the score is then multiplied by -1. Positive scores therefore always denote above-average outcomes.

2 https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1584543810241&uri=CELEX:52020SC0524

3 https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1591720698631&uri=CELEX:52020DC0525

4 https://www.imf.org/en/Publications/CR/Issues/2019/07/11/Slovak-Republic-2019-Article-IV-Consultation-Press-Release-Staff-Report-47103

5 https://read.oecd-ilibrary.org/economics/oecd-economic-surveys-slovak-republic-2019_eco_surveys-svk-2019-en#page1

6 Economic Policy Reforms 2019: Going for Growth, OECD Publishing, Paris.

7 https://www.mfsr.sk/files/en/finance/institute-financial-policy/strategic-documents/national-reform-program/npr_2020_final_en.pdf

and Competitiveness of the Slovak Republic[8] was published, for the year 2019, by the National Productivity Board of the Slovak Republic and the Institute for Strategy and Analysis of the Government Office of the Slovak Republic.

In October 2020 the Ministry of Finance submitted for public discussion an integrated reform plan entitled "Moderné a úspešné Slovensko" (Modern and Successful Slovakia).[9] This extensive analytical document was a response to EU reform challenges, for whose funding the EU established the Next Generation EU (NGEU) fund. The document summarised long-delayed reforms and current reform imperatives into eight areas that overlap with the NGEU funding framework. The identified areas (along with proposed solutions, deadlines, and defined outcomes and impacts) represent a high-quality medium-term vision for Slovakia, one that depends on the efficient use of all public resources.

There have also been ad hoc publications looking at structural challenges and policies in Slovakia. For example, a paper by Filko et al.[10] discusses approaches to measuring quality of life and proposes outcome indicators that can be used for setting targets and evaluating structural policies. For its part, the Ministry of Finance's Institute for Financial Policy (IFP) has proposed a methodology for identifying three reform priorities as a basis for measures under the National Reform Programme.[11] Similarly, the Ministry of Environment's Institute for Environmental Policy (IEP) used the same methodology in identifying waste management, air quality, and forest quality as the three main environmental challenges in Slovakia.[12] Last but not least, recommendations of a largely structural nature are being made in reports produced under the Value for Money (VfM) project.[13]

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8 https://ec.europa.eu/info/sites/default/files/economy-finance/7814_report-on-productivity-and-competitiveness-of-the-slovak-republic-npb-isa-final2.pdf

9 https://www.mfsr.sk/files/archiv/8/MaUS_NIRP2.pdf

10 Filko, M. et al., "Structural Policy Challenges in Slovakia", *NBS Discussion Paper,* No 1, Národná banka Slovenska, 2010.

11 "Tri výzvy slovenskej ekonomiky: Metodika identifikácie priorít Slovenska" (Three challenges for the Slovak economy: A methodology for identifying Slovakia's priorities), Institute for Financial Policy, Ministry of Finance of the Slovak Republic, March 2015.

12 "Tri výzvy životného prostredia na Slovensku: Medzinárodné porovnanie kľúčových indikátorov životného prostredia" (Three environmental challenges in Slovakia: An international comparison of key environmental indicators), Institute for Environmental Policy, Ministry of Environment of the Slovak Republic, January 2017.

13 https://www.mfsr.sk/sk/financie/hodnota-za-peniaze/

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3 Slovakia's main challenges

Slovakia has stopped catching up with the EU economic level. GDP per person is 30% lower than the EU27 average.

The Slovak economy has a problem in that productivity is stagnating in relation to the EU27 average. Hourly productivity is more than one-quarter below the EU27 average.

While economic performance is subdued, material consumption cannot be expected to increase. Average household disposable income in Slovakia is 28% lower than the EU27 average and actual consumption is even lower.[14] Compared with the EU average, people in Slovakia spend two-thirds less on transport and one-half less on hotel and restaurant services and on clothing and footwear. In Slovakia, consumer spending is focused on non-durable consumption goods (food and beverages), and in this area it is almost at the level of the EU27 average. Spending on durable goods (e.g. cars) is half of the average. Even after taking into account health, education and other services that households do not pay for out of their disposable income, low actual consumption is a long-term trend. In only three of the EU27 countries is the level of actual consumption lower than in Slovakia.

Table 1 Economic convergence indicators (percentage of EU27 average; at purchasing power parity)

Indicator	2016	2017	2018	2019
Gross domestic product per capita	73	71	71	70
Labour productivity per hour worked	73	72	73	73
Disposable income per capital	68	69	72	72
Actual individual consumption per capita	70	68	69	69
Compensation per employee	64	63	64	65
Compensation per hour worked	60	60	61	63
GDP deflator	73	75	77	79
Price level of household actual consumption	72	76	78	79
Price level of household final consumption	78	82	84	86

Source: Eurostat.
Notes: Eurostat data before and after 2016 are not comparable (a revision of purchasing power parity is taken into account in 2016–19 period). Purchasing power parity (PPP) represents an artificially constructed common currency that eliminates differences in price levels across countries and enables the comparison of volume indicators between different countries.

[14] Actual consumption includes not only households' purchases of goods and services, but also public spending on individual consumption of health, education and other services. Disposable income is the net income from which households make allocations to consumption and savings.

At the same time, however, the price level in Slovakia is far closer to the EU27 average, owing mainly to rapid adjustments in prices of tradable goods as well as in prices of housing services. Slovakia's price level of consumption goods and services is only 14% shy of the EU27 average. Clothing and footwear prices are almost on a par with the EU27 average, while food and housing prices are lower by only 5% and 7% respectively. Slovakia even exceeds the EU27 average in prices of mobile devices, communication, and non-alcoholic beverages. In ten of the EU27 countries, including the three other V4 countries, the price level is currently lower than in Slovakia.

Other prices indices for Slovakia, such as the GDP price deflator index or actual consumption index (including government-funded services), are lagging slightly behind the consumer price index in terms of convergence with the EU27 average, mainly because of prices of health, government services, and residential and non-residential buildings.

The challenges facing Slovakia, however, go beyond just the economic gap with other EU countries. In order to identify Slovakia's most problematic areas (so-called policy gaps), we compared Slovakia with EU and OECD countries in terms of outcomes in monitored quality of life dimensions. Chart 1 compares Slovakia's relative scores in six areas: productivity; the labour market; economic vulnerabilities; social inclusion; health; and the environment. In Sections 4 to 8 we provide more in-depth analysis of Slovakia's lagging outcomes in additional indicators within these dimensions.

The economic gap between Slovakia and the EU average is largely a result of low productivity. Despite some progress in recent years, we also continue to lag behind in terms of integrating people into economic activity. Narrowing the gap with the EU average in these area will above all require reform efforts targeted at the education system, the economy's capacity, and environmental quality.

Slovakia faces one of its greatest challenges in the area of health, in which it lags far behind in all outcome indicators. Compared with neighbouring countries, life expectancy is shorter in Slovakia and the proportion of deaths from preventable causes is higher. Infant mortality is higher than the EU average and also higher than in other V4 countries. Among the reasons for the poor health outcomes are high air pollution and the social marginalisation of Roma communities.

Because of its economic level, Slovakia has a low carbon footprint and low waste production rate by EU standards. Air pollution, however, is a problem, as is the still below-average waste recycling rate. Given its relatively low economic level, Slovakia's production of greenhouse gas (GHG) emissions per capita is relatively low. Compared with 1990, moreover, their level

is significantly lower owing to the country's economic transformation. Slovakia's relatively low economic level is also reflected in its lower production of municipal waste. On the other hand, Slovakia has an environmental problem in the form of air pollution and its upward impact on premature deaths.

But despite what is at first sight a favourable assessment of environmental outcomes, Slovakia will in coming decades face a considerable challenge on the environmental dimension: how to reconcile its climate neutrality commitment with convergence towards advanced economies.

The Slovak economy's increasing vulnerability as a result of the deteriorating sustainability of public finances is problematic. Slovakia has a rapidly ageing population, which, together with the public finance repercussions of the pandemic crisis, poses high risks to the future sustainability of public finances. Today, Slovakia has one of the youngest populations in the EU, with the ratio of its working-age population to its elderly population standing at four to one. That ratio, however, will rapidly move towards one and a half to one, and by 2060 we will lie at the other end of the ranking.

As regards external imbalances, the pre-pandemic period saw a strong increase in unit labour costs that was reflected in the balance of payments current account. The only account in surplus was trade in services. Any continuation of this trend may in future, in the context of monetary union, bring risks of a painful resurgence of the external imbalance.[15]

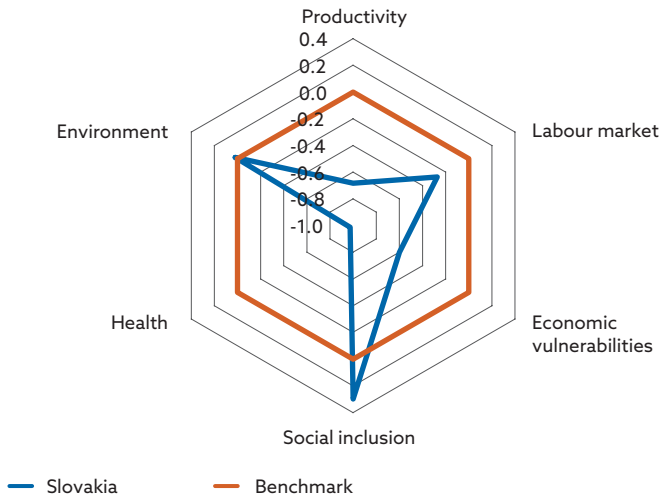
Slovakia seems to be in a favourable situation in terms of private debt, which is still relatively low compared with other EU countries, and the soundness of its banking sector. What is problematic, however, is the sharp rise in private debt ratios in recent years and their high level compared with countries at a similar stage of development. The banking sector, for its part, may face risks associated with pandemic crisis repercussions.

The extent of income inequality and the at-risk-of-poverty rate are relatively low in Slovakia; however, there are problems in the form of absolute poverty, the exclusion of marginalised Roma communities, and gender inequalities. Slovakia has one of the lowest levels of income inequality in the EU, which translates into a relatively low proportion of people at risk of poverty and an overall favourable assessment for outcome indicators in the area of social inclusion. At the same time, however, using these data cannot give us a full picture of the extent of social exclusion, particularly in regard to marginalised Roma communities. This represents a challenge,

[15] In its Spring 2021 Economic and Monetary Developments report, Národná banka Slovenska expects that the exchange rate component of monetary policy will have an expansionary impact in the years 2021 to 2023. This could mitigate external imbalance risks.

one that is closely related with labour market developments, health, and the educational level of the population. Another challenge in the area of inclusion is the gender gap in both wages and labour market participation.

Chart 1
Outcome indicator scores vis-à-vis the benchmark



Sources: Eurostat, Ameco, ECB, EC, OECD, and NBS calculations.
Notes: The scores denote the difference between the indicator value for Slovakia and the average of the reference countries normalised by the standard deviation. Positive values denote above-average outcomes. For productivity, the outcome indicator is GDP per hour worked at purchasing power parity; for the labour market, the employment rate. On other dimensions, composites of indicators from the respective sections were used.

Many of Slovakia's challenges are also regional in nature. Regional disparities measured through performance per capita are significant and narrowing slowly. Compared with other EU countries, Slovakia and Czechia have the joint-highest disparity between their economically strongest region and other regions (the next highest disparities are in Romania and Bulgaria). Comparing regional GDP can be used to measure inter-regional disparities in output, but not in household income.

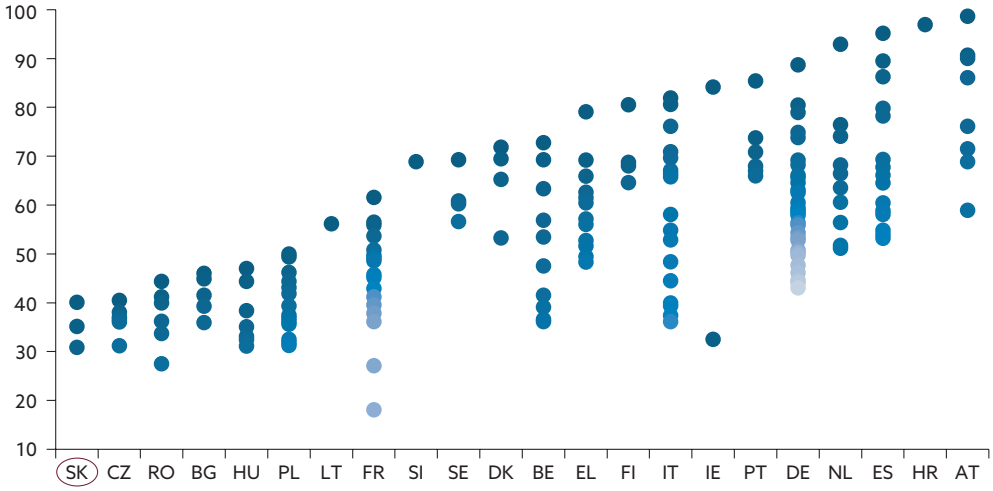
People from other regions contribute substantially to Bratislava Region's production, which means that the regional disparities are actually lower. Incomes of non-Bratislava residents are reflected in the disposable income of the region in which they are consumed. The weakest region – eastern Slovakia – accounts for 31% of Bratislava Region's GDP and 56% of its disposable income.

Regional disparities have been moderating in recent years. In terms of GDP, the gap between eastern Slovakia and Bratislava Region narrowed by three percentage points in 2019 after a long period of stagnation. That change, however, was due to the weakened output of the stronger region. As for disposable income, the gap narrowed by four percentage points, in this case due to the eastern region's improvement on that metric.

As disposable income has increased in eastern Slovakia, so too has income inequality. Although Slovakia is still a country with low income inequality, it became apparent in 2019 that income distribution was moderately less even in eastern Slovakia than in the rest of the country. Five years earlier there were hardly any inter-regional differences in income inequality.

Chart 2

Regional GDP per capita at purchasing power parity (index: 2019 GDP of the economically strongest region in each country = 100)



Source: Eurostat.

During the period when economic growth was recovering, inter-regional disparities in the unemployment rate decreased, although they still remain large (the gap between eastern Slovakia and Bratislava Region narrowed from 5.5 percentage point in 2015 to 4.1 percentage point in 2019). Until 2019 the strong demand for labour was reducing the ranks of the unemployed in all regions. Job creation was highest in Bratislava Region and, thanks to internal mobility, the drop in unemployment was greater in the less developed regions. The employment rate increased in all regions.

The share of young people not in employment, education or training (NEETs) is more than twice as high in eastern Slovakia as in the rest of the country. In central Slovakia from 2015 to 2019, not only was this share successfully reduced, but so was the share of early leavers from education and training. On the other hand, central Slovakia was the only region to report a downtrend in the proportion of early leavers from education and training; other regions saw the share increase. In the case of this indicator, both the national average and inter-regional disparities increased.

As regards the share of individuals who have never used a computer, inter-regional disparities have decreased. However, this narrowing of the

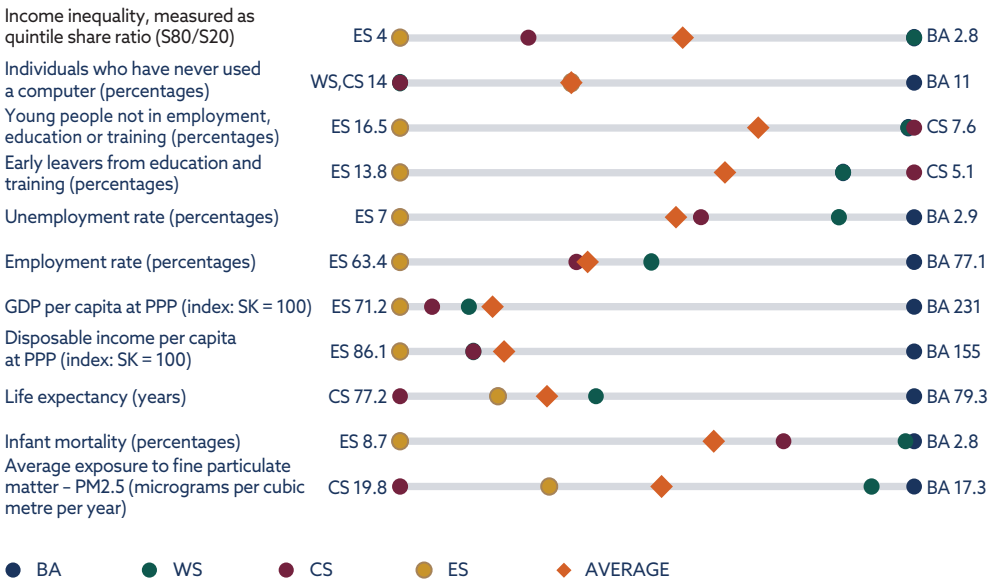
gaps (and the unchanged national average) is due to worse results in Bratislava Region and eastern Slovakia.

Life expectancy in Slovakia is highest in Bratislava Region, where it is two years longer than in central Slovakia. Across the provinces, life expectancy has in recent years been getting closer to the median level in Bratislava, with eastern Slovakia making the most progress in that regard. Because of the weaker improvement in central Slovakia, the gap between the best and worst regions for life expectancy was almost the same in 2019 as in 2015.

In terms of infant mortality, eastern Slovakia has for a long time performed notably worse than other regions, while the national average has shifted clearly above the figure for the second worst region in the country. The situation in eastern Slovakia stems from it having a larger share of marginalised Roma communities, which have an infant mortality rate almost three times higher than that of the rest of the population. Inter-regional disparities in this indicator have moderated, but inconsistently so. In the best-performing Bratislava Region, infant mortality has deteriorated. On the other hand, the national average has remained unchanged owing to an improvement in the figures for western Slovakia.

Air pollution measured in terms of exposure to fine particular matter (PM2.5) is most marked in central Slovakia. Recent years have seen the levels of this pollution improve noticeably in each region, although the gap between central Slovakia, the most polluted region, and Bratislava Region, with the lowest pollution, was the same in 2019 as in 2015.

Chart 3
Selected indicators for Slovak regions



Source: Eurostat.
Note: BA – Bratislava Region, WS – western Slovakia, CS – central Slovakia, ES – eastern Slovakia.

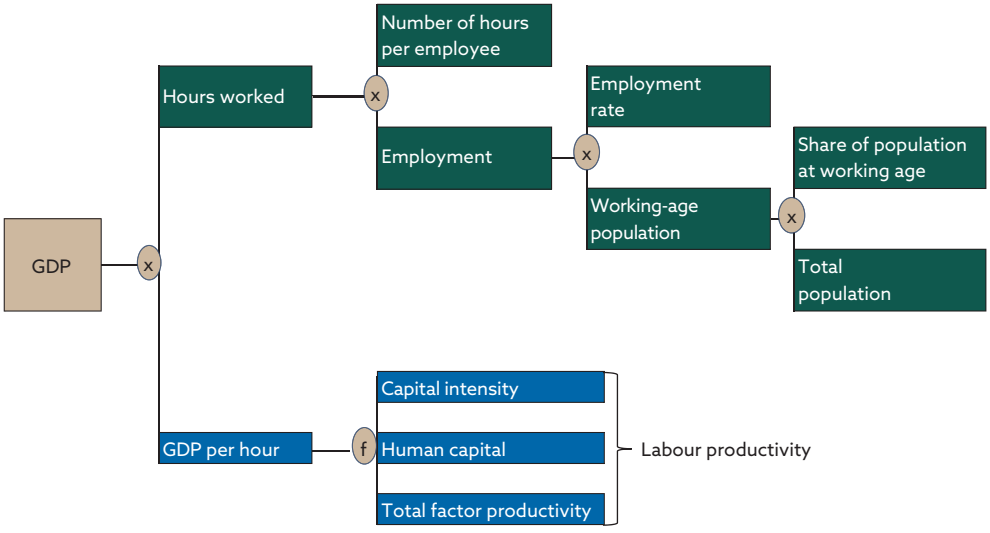
4 Economic performance

Without structural changes, Slovakia is condemned to stagnation. In the years before the pandemic crisis, Slovakia's economic performance was catching up with the EU27 average on the back of increases in productivity growth and in the number of hours worked. In today's socio-economic conditions, however, both of these factors have reached their limits.

In terms of investment in innovative and productive assets and its capacity to multiply value added, Slovakia is lagging behind Western countries. A fuller picture of that gap is provided by the breakdown of GDP into factors affecting productivity and factors affecting the number of hours worked (Figure 2). Although the undersized capital stock has been on a lengthy uptrend and productivity has also been rising, the productivity gap stems from the quality of human capital – the level of people's education and skills. The widening of the gap in recent years is due to total factor productivity, which includes factors such as technological progress, work process efficiency, quality of institutions, and the business environment.

The number of hours worked has increased because of the employment of an increasing number of working-age people. This trend, however, is subject to the constraints of a declining number of working-age people (since 2017) and the limited scope for increasing the number of hours per employee (given that Slovakia is far exceeding the EU average on this metric). Sources of employment rate growth can be found in the improved labour force participation of low-skilled people, younger people, older people, women, and foreign workers, and in the expansion of part-time work and adult learning.

Figure 2
GDP breakdown

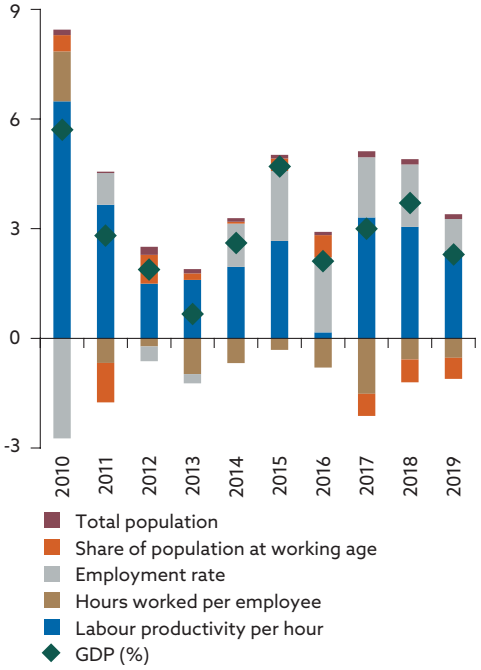


Source: OECD.

Labour productivity growth has so far been driven by the accumulation of physical, mainly imported, capital (machinery and equipment) and less productive, but necessary, infrastructure capital (buildings, roads). This is tangible capital that has not managed to increase the share of value added in production and exports.

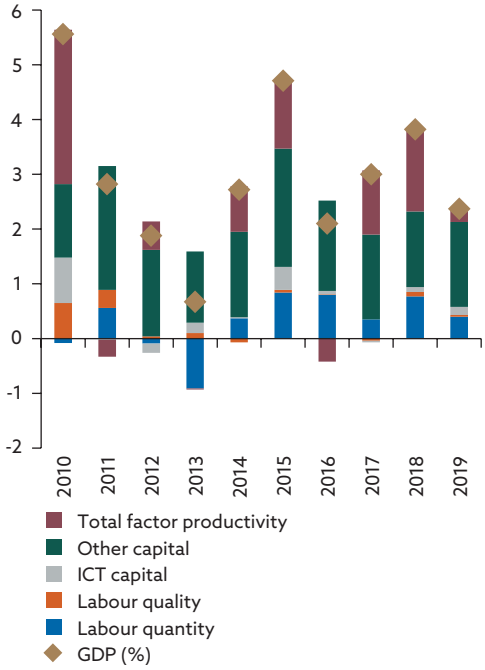
Nor, at present, is gross fixed capital formation performing well. Our investment is down and it is going into conventional, less innovative, types of assets.

Chart 4
Economic growth broken down by productivity and labour market factors (percentage points; percentages)



Sources: Eurostat, OECD, and NBS calculations.

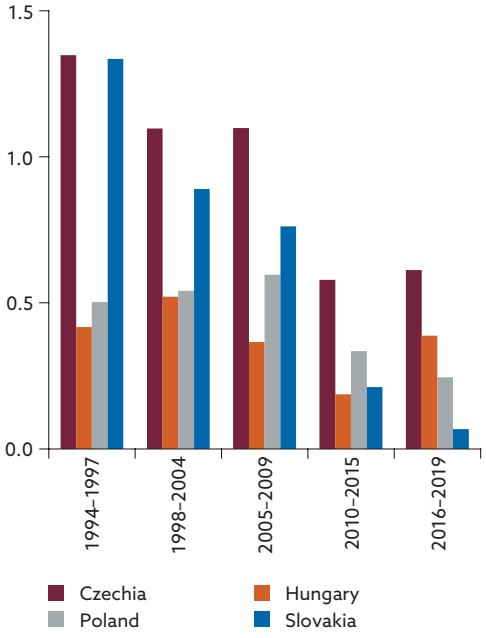
Chart 5
Economic growth broken down by factors of the production function (percentage points; percentages)



Sources: Total Economy Database™, and NBS calculations.

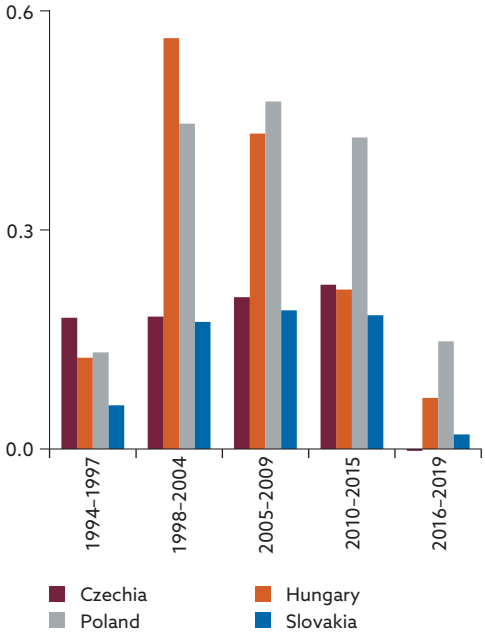
There is almost no positive contribution to Slovakia's economic growth from increases in either labour quality or investment in information and communication technology (ICT – including software, hardware, databases, telecommunications equipment and R&D). Labour quality (the skill level of workers according to their level of education, labour market integration, and training) has deteriorated in all V4 countries, but in Slovakia most of all. ICT investment has gradually decreased to a record low. The characteristics of a knowledge economy are weaker in Slovakia than in any other V4 country. The ICT situation is not keeping pace with global technological developments. The main difficulties are in capacities for education and training and for high-quality provision of public services. The shortcomings in these areas stem from underinvestment in ICT.

Chart 6
ICT contribution to economic growth (percentage points)



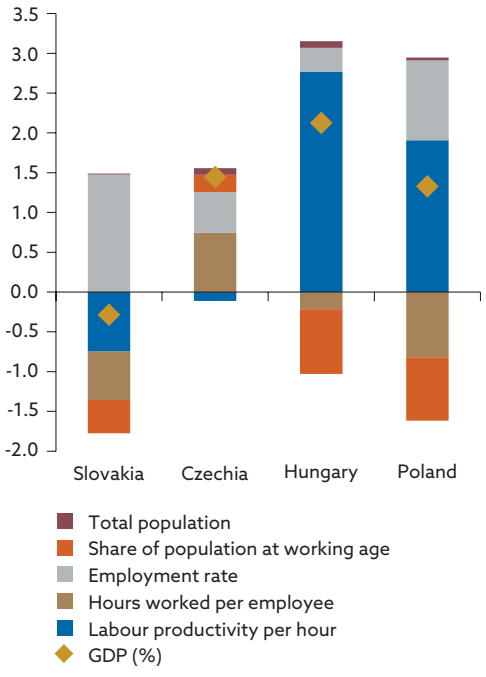
Sources: Total Economy Database™, and NBS calculations.

Chart 7
Labour quality contribution to economic growth (percentage points)



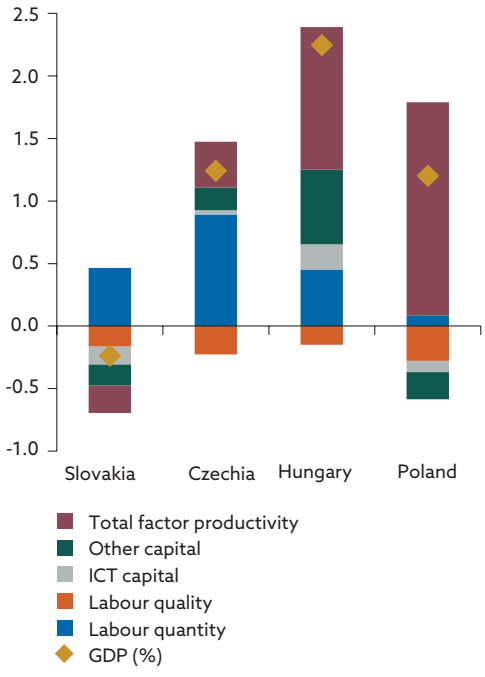
Sources: Total Economy Database™, and NBS calculations.

Chart 8
Economic growth broken down by productivity and labour market factors (2016–2019 vis-à-vis 2010–2015; percentage points of GDP)



Sources: Eurostat, OECD, and NBS calculations.

Chart 9
Economic growth broken down by factors of the production function (2016–2019 vis-à-vis 2010–2015; percentage points of GDP)

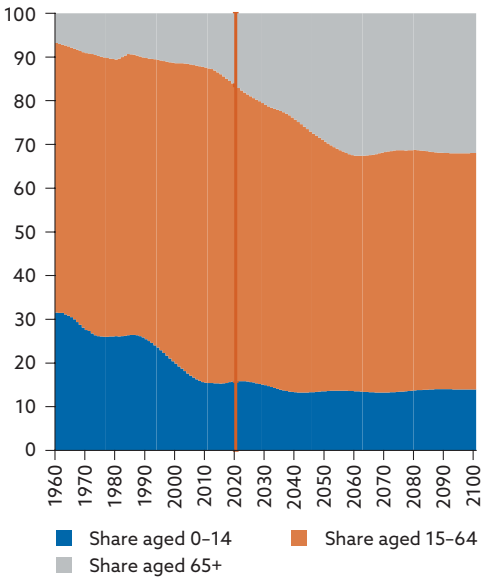


Sources: Total Economy Database™, NBS calculations.

Slovakia's economic growth, which up to now has been based on quantity (the number of employed people and the amount of tangible capital), is losing momentum. The other V4 countries have performed better and been more productive. In Hungary and Poland the higher economic growth was driven by an increase in productivity growth. Productivity in all three of the other V4 countries has been supported by technological progress (total factor productivity). In Slovakia, the impacts of technological progress, labour quality and total investment have declined.

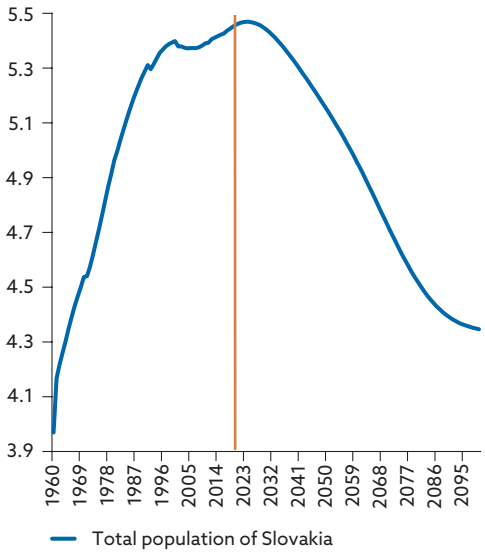
Economic performance would have declined further but for increasing employment, i.e. labour quantity. Because of demographic changes, the share of the population at working age has been falling since 2017 and will remain on a downtrend for the next ten years.

Chart 10
Age structure of the total population



Sources: Eurostat, and EUROPOP2019.

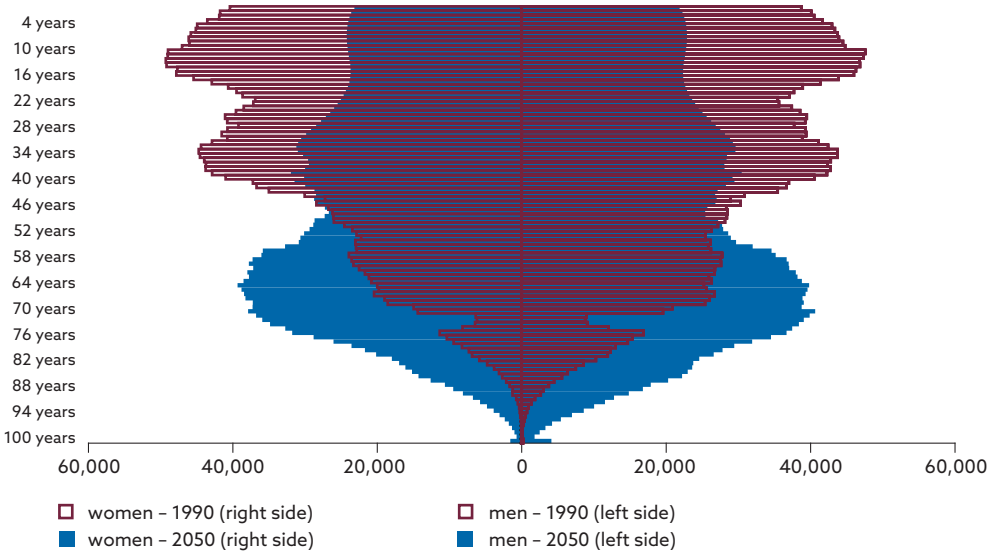
Chart 11
Total population in Slovakia (millions of people)



Sources: Eurostat, and EUROPOP2019.

An age structure chart illustrates the demographic changes that will affect economic performance in Slovakia – via labour quantity, health and social care, the sustainability of public finances in regard to pensions, etc. In 1990 the largest age cohort was young people aged 0–16, followed by people in their thirties. By 2050, sixty years on, the number of people aged under 50 will have fallen sharply and the largest cohort will be people aged 60 and over. According to Eurostat's projection, Slovakia's population in 2100 will be down to around 4.35 million, similar to its level in 1965.

Chart 12
Age structure of Slovakia's population



Sources: Eurostat, and EUROPOP2019.

4.1 Productivity

Foreign sources of technological diffusion channelled through foreign direct investors and their suppliers seem to be exhausted. Foreign direct investment (FDI) seeks regions with a skilled labour force, but in Slovakia there is limited investment in labour quality. A decrease in labour quality could contribute to a decline in FDI. In the absence of further major FDI inflows, the factor productivity gap between Slovakia and the EU average has widened.

Slovakia is not replacing imported technology and know-how with domestic innovations to a sufficient extent. Because of its innovation shortcomings, Slovakia is not moving up the value chain, while doing so would lead to increases in productivity, wages, consumption, and material well-being.

Slovakia's exports have for a long time included a high share of foreign value added, and the gap with the EU average on this metric is even widening. Domestic exports include a considerable volume of re-exported products. The share of domestic value added embodied in exports through global value chains appears to have increased to the EU average. Subsequent developments will show whether the closing of that gap is temporary or permanent.

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Table 2 Factors of economic growth

Category	Indicator		2010	2015	2016	2017	2018	2019	2020
Outcome indicator	GDP per hour worked	SK	26.2	29.3	27.7	27.6	28.3	28.8	
	(PPP units) Sources: Eurostat, NBS calculations	EU average	31.3	35.5	35.7	36.9	37.7	38.7	
Additional indicators	Total factor productivity	SK	5.4	1.2	-0.4	0.4	1.2	0.0	
	(annual percentage change) Source: Eurostat	EU average	1.9	2.2	1.0	1.7	1.2	0.6	
	Capital stock per employee	SK	3.6	2.9	0.4	0.7	0.9	2.2	
	(annual percentage change) Source: DF ECFIN Ameco	EU average	3.3	0.4	0.0	-0.2	0.1	1.3	
	Fixed capital formation	SK	8.1	21.6	-9.3	3.5	2.6	5.8	-11.9
	(annual percentage change) Source: Eurostat	EU average	-3.1	8.2	4.3	6.2	3.9	7.0	-4.7

Category	Score	2010	2015	2016	2017	2018	2019	2020
Outcome indicator	GDP per hour worked	-0.43	-0.44	-0.57	-0.65	-0.66	-0.68	
Additional indicators	Total factor productivity	1.61	-0.24	-0.84	-0.84	0.01	-0.55	
	Capital stock per employee	0.13	1.28	0.19	0.53	0.46	0.40	
	Fixed capital formation	1.15	0.85	-0.95	-0.54	-0.25	-0.09	-0.87

Table 3 Economic openness

Indicator		2010	2014	2015	2016	2017	2018	2019
Export performance	SK	75	91	90	93	94	96	94
(BPM6, percentage of GDP) Source: United Nations	EU average	60	68	69	68	70	70	70
Foreign direct investment inflow	SK	2.0	-0.5	0.1	0.9	4.2	1.6	2.3
(percentage of GDP) Source: OECD	EU average	3.6	2.4	4.7	3.0	3.2	5.8	
Foreign value added embodied in domestic exports [1)]	SK	44	47	47	46	45		
(percentage of exports) Source: OECD	EU average	30	32	31	31	30		
Domestic value added embodied in foreign exports [1)]	SK	17	17	17	18	19		
(percentage) Source: OECD	EU average	18	19	19	19	19		
Re-exported intermediate imports [1)]	SK	66	73	73	72	68		
(percentage) Source: OECD	EU average	48	52	52	52	51		

Score	2010	2014	2015	2016	2017	2018	2019
Export performance	0.47	0.60	0.53	0.67	0.68	0.69	0.64
Foreign direct investment inflow	-0.23	-0.62	-0.26	-0.50	0.30	-0.32	
Foreign value added embodied in exports [1)]	-2.34	-1.97	-1.99	-1.92	-2.06		
Domestic value added embodied in foreign exports [1)]	-0.42	-0.56	-0.60	-0.37	0.00		
Re-exported intermediate exports [1)]	-1.58	-1.97	-1.96	-1.85	-1.57	-1.73	

Note: 1) Data for the period 2012–2015(2016)

Foreign value added and re-exports are ensuring that Slovakia maintains solid results in high-tech product exports and in innovation sales. This largely reflects the impact of FDI; there has been less success in adding value to domestic production through more profitable new products. Any successes in production growth are not bringing the desired increase in either value added or labour productivity.

The introduction of innovative products is being hampered because Slovakia, compared with the EU average, has a less favourable environment and lower R&D funding. Business expenditure on R&D remains further below the EU average than does public spending on the same. The extent to which the private sector is co-funding public R&D activities is closer to the EU level. In the area of attractive research systems. Slovakia is falling behind in terms of the international competitiveness of the scientific base. the proportion of Slovak publications that are highly cited. and the number of foreign doctoral candidates. Research linkages are weaker both between innovative firms and between the private and public sectors.

As a result. Slovakia is weak in the production of intellectual assets (patents, trade marks, designs) and has a low incidence of innovators. i.e. firms that have brought an innovative product or process to market or introduced one in their own organisation.

In terms of digital and technological capacity, the gap between Slovakia and the EU average is not narrowing. The Slovak economy will in coming years need to benefit from the digital transformation. Fast broadband connectivity will make it possible, inter alia, to tap the e-commerce potential of Europe and the world. If Slovakia is to be prepared for the digital world, it must integrate digital technologies into private and public sectors and invest in people's digital skills. Although its robotisation in manufacturing industry has increased in recent years, Slovakia is not managing to close the gap with the advanced economy average, which encompasses highly roboticised economies such as Japan and the United States.

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Table 4 Innovation capacity

Indicator		2012	2014	2015	2016	2017	2018	2019
R&D expenditure – business sector	SK	17	28	23	24	30	36	34
(standardised index: EU 2012 = 100)	EU average	74	75	75	75	75	77	81
R&D expenditure – public sector	SK	41	47	67	118	38	40	36
(standardised index: EU 2012 = 100)	EU average	78	82	80	83	70	71	74
Private co-funding of public R&D expenditure	SK	69	78	58	86	80	64	58
(standardised index: EU 2012 = 100)	EU average	78	76	75	74	75	70	70
Innovators	SK	60	40	40	33	33	37	37
(standardised index: EU 2012 = 100)	EU average	87	80	80	77	77	87	84
Attractive research systems	SK	34	41	42	48	50	49	56
(standardised index: EU 2012 = 100)	EU average	93	100	103	104	109	114	114
Innovation-friendly environment	SK	57	54	63	64	76	77	87
(standardised index: EU 2012 = 100)	EU average	109	108	112	120	140	154	172
Knowledge-intensive services exports	SK	36	36	36	34	34	42	44
(standardised index: EU 2012 = 100)	EU average	69	70	70	72	73	73	69
High-tech product exports	SK	124	134	139	143	140	142	147
(standardised index: EU 2012 = 100)	EU average	79	86	91	93	90	90	95
Intellectual assets	SK	36	40	41	38	43	46	40
(standardised index: EU 2012 = 100)	EU average	81	86	86	86	86	85	82
Linkages	SK	67	68	56	77	75	66	63
(standardised index: EU 2012 = 100)	EU average	97	93	92	95	96	97	97

Score	2012	2014	2015	2016	2017	2018	2019
R&D expenditure – business sector	-0.98	-0.83	-0.94	-0.92	-0.84	-0.77	-0.86
R&D expenditure – public sector	-0.85	-0.80	-0.30	0.81	-0.69	-0.68	-0.83
Private co-funding of public R&D expenditure	-0.26	0.06	-0.47	0.35	0.14	-0.17	-0.38
Innovators	-0.68	-1.02	-1.02	-1.04	-1.04	-1.12	-1.03
Attractive research systems	-0.94	-0.90	-0.92	-0.88	-0.90	-0.98	-0.91
Innovation-friendly environment	-0.79	-0.79	-0.75	-0.86	-0.89	-1.06	-1.14
Knowledge-intensive services exports	-0.79	-0.83	-0.85	-0.93	-0.95	-0.77	-0.69
High-tech product exports	1.31	1.31	1.35	1.41	1.49	1.52	1.49
Intellectual assets	-1.17	-1.22	-1.22	-1.28	-1.19	-1.12	-1.21
Linkages	-0.68	-0.57	-0.81	-0.38	-0.45	-0.66	-0.70

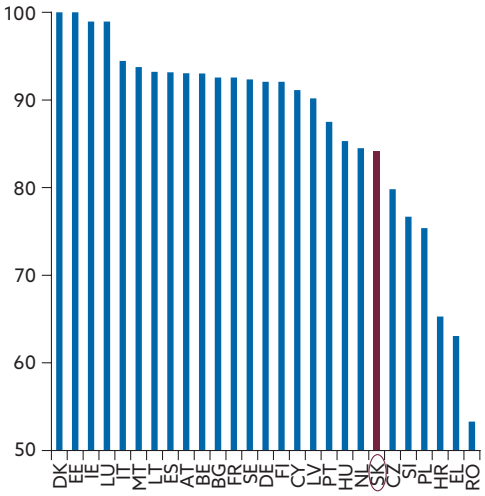
Source: The European Commission's European innovation scoreboard (EIS).

Table 5 Digital technology and infrastructure

Indicator		2015	2016	2017	2018	2019	2020
Robot density in manufacturing	SK	79	135	151	165	169	
(number of robots per 10,000 workers) Source: IFR	IFR member countries' average	200	224	240	266	286	
Broadband connectivity	SK	29	32	36	38	40	47
(score: 0–100) Source: European Commission	EU average	33	36	39	42	47	52
Integration of digital technology	SK	28	31	31	36	33	33
(score: 0–100) Source: European Commission	EU average	30	33	36	39	41	43
Score		**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Robot density in manufacturing		-1.05	-0.66	-0.54	-0.51	-0.55	
Broadband connectivity		-0.49	-0.54	-0.40	-0.54	-0.92	-0.57
Integration of digital technology		-0.22	-0.22	-0.42	-0.24	-0.56	-0.70

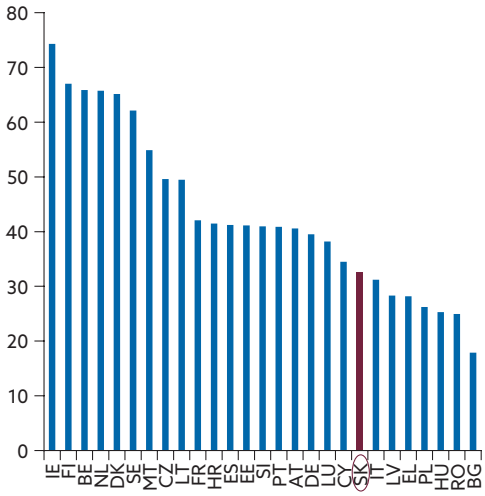
The above-mentioned decline in total factor productivity reflects not only the technological gap between Slovakia and advanced economies, but also gaps in business environment quality and institutional quality. The business environment has long been hindered by insolvency procedures that are longer than the EU average and therefore result in additional costs for businesses. Business start-up processes are more protracted, though start-up costs are lower. Costs of court procedures in business disputes are also lower, but court procedures are longer than the EU average.

Chart 13
Digital public services for business (outcome for 2020)



Source: European Commission.

Chart 14
Digital technology integration (outcome for 2020)



Source: European Commission.

Compared with the EU average, the general quality of government policies and regulations in Slovakia remains less conducive to business sector development. This indicator concerns the government's ability to formulate and implement clear and reliable policies that support the private sector.

Regulatory processes must be further improved, and the digitalisation of public services may help in this regard. Streamlining regulation and cutting red tape will help firms compete more successfully in a globalised world, where efforts to improve efficiency are essential. Slovakia also seems to be in an unfavourable position according to several rankings of competitiveness (see Box 2).

Table 6 Business environment

Indicator		2010	2015	2016	2017	2018	2019	2020
Regulatory quality	SK	1.00	0.79	0.89	0.82	0.81	1.01	
(score: from -2.5 to +2.5) *Source: World Bank*	EU average	1.21	1.15	1.14	1.15	1.15	1.19	
Enforcing contracts – time	SK	565	775	775	775	775	775	775
(days) *Source: World Bank*	EU average	582	638	627	633	633	633	633
Enforcing contracts – cost	SK	30.6	30.6	30.6	30.4	20.5	20.5	20.5
(percentage of contracts) *Source: World Bank*	EU average	21.4	21.2	21.3	21.5	21.0	21.0	20.9
Resolving insolvency – time	SK	4	4	4	4	4	4	4
(years) *Source: World Bank*	EU average	2.0	1.8	1.8	1.8	1.8	1.8	1.8
Resolving insolvency – cost	SK	18	18	18	18	18	18	18
(percentage of debt) *Source: World Bank*	EU average	10.3	9.7	9.7	9.7	9.7	9.7	9.7
Starting a business – time	SK	28.5	26.5	26.5	26.5	26.5	26.5	21.5
(days) *Source: World Bank*	EU average	17.0	13.2	12.0	11.5	11.5	11.6	10.9
Starting a business – cost	SK	2.0	1.5	1.5	1.1	1.1	1.0	1.0
(percentage of average income) *Source: World Bank*	EU average	5.6	4.0	3.6	3.5	3.1	3.0	3.0
Digital public services for business	SK		58.6	50.8	57.5	73.1	77.7	84.1
(score: 0–100) *Source: European Commission*	EU average		70.5	76.3	80.3	82.4	83.8	87.3

Score	2010	2015	2016	2017	2018	2019	2020
Regulatory quality	-0.51	-0.77	-0.51	-0.66	-0.71	-0.43	
Enforcing contracts – time	0.06	-0.44	-0.50	-0.45	-0.45	-0.45	-0.45
Enforcing contracts – cost	-1.12	-1.20	-1.12	-1.07	0.06	0.06	0.05
Resolving insolvency – time	-1.55	-2.32	-2.32	-2.32	-2.32	-2.32	-2.32
Resolving insolvency – cost	-1.44	-1.62	-1.62	-1.62	-1.62	-1.62	-1.62
Starting a business – time	-0.85	-1.50	-1.56	-1.71	-1.71	-1.71	-1.27
Starting a business – cost	0.58	0.61	0.55	0.62	0.54	0.55	0.54
Digital public services for business		-0.72	-1.64	-1.64	-0.76	-0.53	-0.27

As regards institutional quality, changes are essential in the areas of rule of law and control of corruption. The quality of contract and property rights enforcement and trust in the police and courts must be raised to advanced world levels. At the same time, the involvement of elite and private interests in the exercise of public authority must be eliminated. The political and institutional environment affects total factor productivity

in the long run. It is a co-shaper of international competition in the domestic market. As for freedom of expression, association and media (voice and accountability), Slovakia's performance on this metric has deteriorated since 2017, as has its score for government effectiveness, which besides public services also covers the degree of independence from political pressure, the quality of policymaking, and the credibility of government commitments.

Table 7 Institutional quality

Indicator		2010	2014	2015	2016	2017	2018	2019
Voice and accountability	SK	0.91	0.96	0.97	0.96	0.94	0.88	0.91
(score: from -2.5 to +2,5)	EU average	1.10	1.09	1.10	1.08	1.07	1.08	1.08
Political stability	SK	1.05	1.04	0.87	0.72	0.91	0.75	0.78
(score: from -2.5 to +2,5)	EU average	0.76	0.75	0.69	0.67	0.70	0.70	0.74
Government effectiveness	SK	0.84	0.88	0.84	0.89	0.80	0.71	0.67
(score: from -2.5 to +2,5)	EU average	1.12	1.10	1.10	1.09	1.07	1.07	1.05
Rule of law	SK	0.57	0.50	0.50	0.65	0.57	0.53	0.56
(score: from -2.5 to +2,5)	EU average	1.13	1.16	1.12	1.09	1.08	1.07	1.08
Control of corruption	SK	0.29	0.16	0.18	0.23	0.22	0.36	0.33
(score: from -2.5 to +2,5)	EU average	0.99	0.96	0.98	0.98	0.95	0.96	0.95
Score		**2010**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Voice and accountability		-0.59	-0.35	-0.39	-0.33	-0.38	-0.51	-0.44
Political stability		0.70	0.73	0.48	0.13	0.57	0.15	0.16
Government effectiveness		-0.47	-0.42	-0.49	-0.36	-0.50	-0.65	-0.68
Rule of law		-0.92	-1.02	-0.93	-0.72	-0.85	-0.89	-0.88
Control of corruption		-0.85	-1.00	-1.02	-0.96	-0.96	-0.76	-0.79

Source: World Bank.

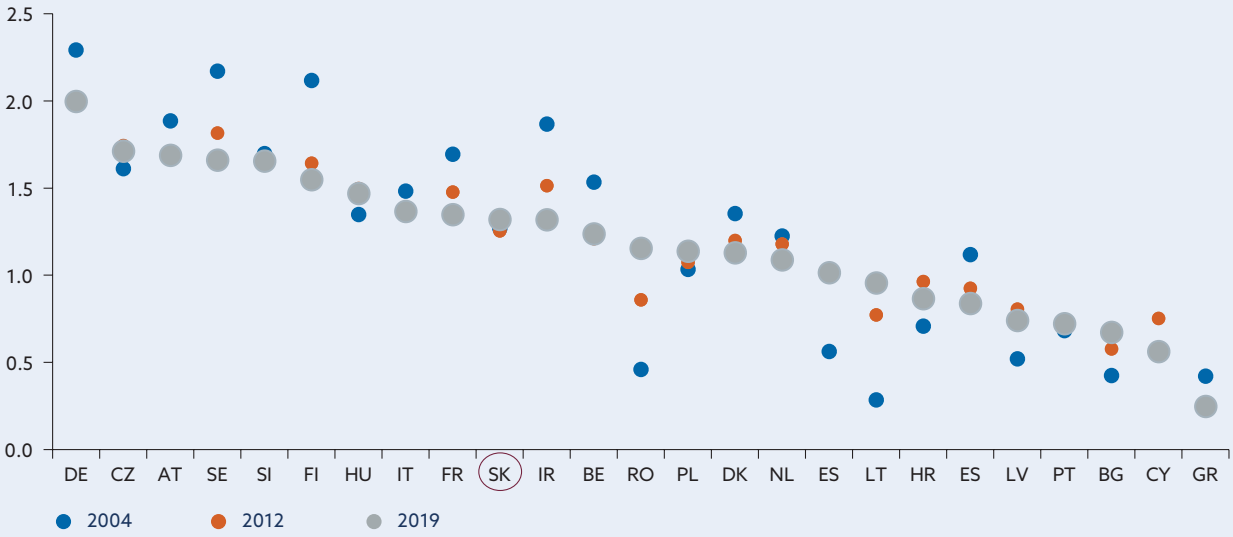
Box 2
Assessing competitiveness through international rankings

In the ranking of the export competitiveness of 156 countries, Slovakia slipped from 20th in 2018 to 18th in 2019. **Among the EU27 countries, Slovakia is one of the most complex exporters, but within the sub-group of central European countries, it ranks behind Czechia, Austria and Hungary** and its position has not changed for a long time. Based on foreign trade data, the ranking expresses the number and complexity of products that a country exports with comparative advantage.

Business environment quality in Slovakia has for some time not been sufficiently supporting competitiveness and growth. In its Doing Business Report, the World Bank evaluates business regulation and laws affecting business in 190 countries. **According to the Doing Business rankings, the business environment in Slovakia improved appreciably in 2016, but it has not made any progress since then.** Slovakia has been overtaken by more reformist coun-

tries, falling from a relatively successful 29th place in 2016 to 45th place in 2020 (for which the evaluation period was the second half of 2018 and the first half of 2019). Among the areas of business activity evaluated, Slovakia's best rating and worst rating have for a while been in, respectively, *trading across borders* and *dealing with construction permits* (in which Slovakia ranks second from bottom among OECD countries).

Chart A
Economic Complexity Index for the EU27



Source: Atlas of Economic Complexity.
Note: Data for Luxembourg and Malta are not available.

The Global Entrepreneurship Monitor (GEM) is a project surveying entrepreneurship in 54 countries. **According to the GEM report, the entrepreneurial ecosystem in Slovakia has not improved despite an economically favourable period** and, compared with other high-income countries, it has long been evaluated as **below average.** Slovakia is positively evaluated mainly in terms of access to foreign markets and removal of trade barriers. According to experts, the factors limiting entrepreneurship in Slovakia include administrative burdens, bureaucratic burdens, unpredictable legislation, a problematic court system, and a high tax and social security contribution burden on business.

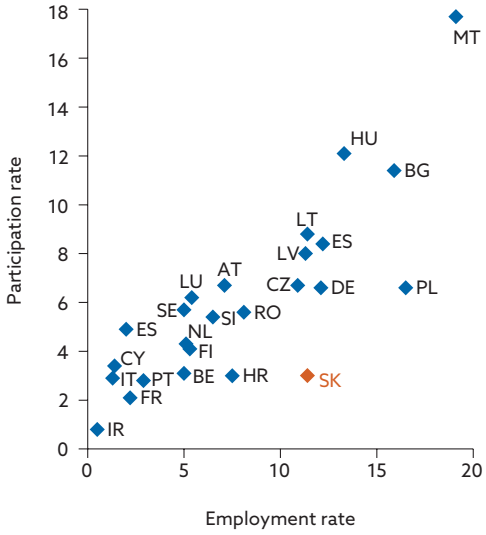
Good governance indices measure the quality of business environments in regard to the quality of government administration. For example, the World Governance Index (WGI) evaluates 215 countries for the processes by which their governments are elected, monitored and replaced. It also evaluates governments' ability to formulate and implement sound policies in an efficient way, the level of respect for regulators, and social interactions between citizens and the state. Slovakia's weakest WGI ratings have for some time been for control of corruption and the quality of the legal system. On the measures of government effectiveness and quality of regulation, Slovakia's deteriorating performance is a matter of concern.

4.2 Labour market

The labour market's contribution to economic performance has consisted of an increasing number of people in employment. The employment rate has been rising, and because a proportion of the new hires were from the ranks of the unemployed, the unemployment rate has been falling (see Box 3). Employment rate growth has also been supported by the recruitment of foreign workers, whose employment rate has risen sharply and now exceeds the rate for the domestic workforce.

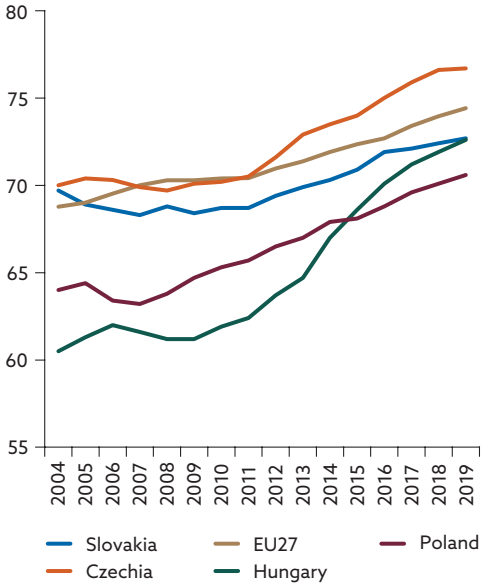
As regards labour force participation, Slovakia has made little progress. The activation of the largest possible proportion of the working-age population is a prerequisite for growing the economy, improving social inclusion, and ensuring a sustainable pension system.

Chart 15
Employment rate and participation (percentage points; difference between 2019 and 2004)



Source: Eurostat.

Chart 16
Participation rate (percentages)

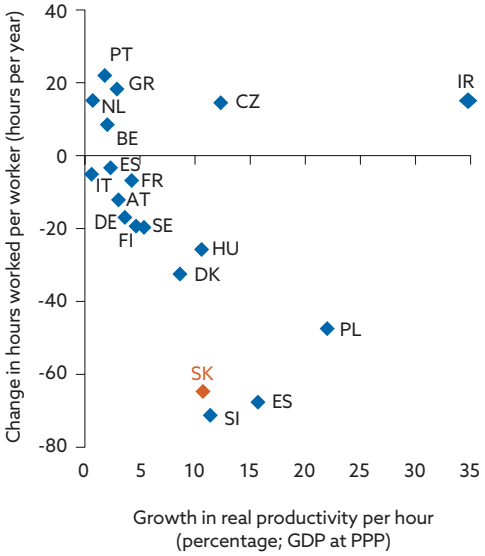


Source: Eurostat.

As the number of working-age people in employment has continued to rise, so has the number of hours worked. A constraint on this trend is the falling number of working-age people and the limited scope for increasing the number of hours worked per employee (given that Slovakia is far exceeding the EU average on this metric). Workers in Slovakia are still working more hours per year than is customary in the EU, although that number is falling from year to year. Compared with other EU countries, Slovakia has one of the highest rates of decrease in hours worked per worker.

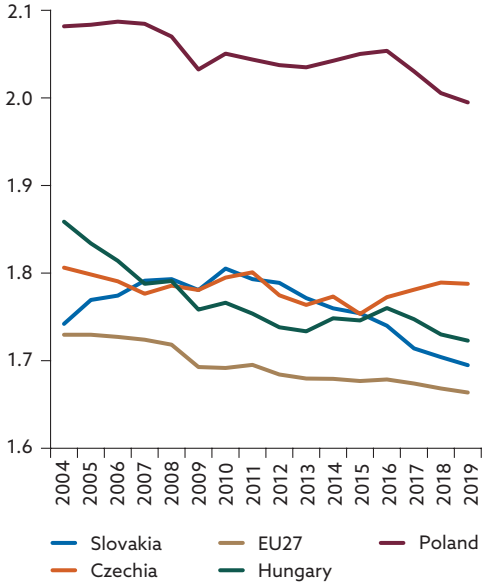
The workforce could be boosted in particular by increasing the employment rate of women aged up to 39 and low-skilled people. In neither case is Slovakia closing the employment rate gap with the EU average, and in the case of low-skilled people, the gap is actually increasing. Among men in Slovakia the employment rate is highest for those aged 25–29. Among women, the risk of unemployment is lowest for the 40–49 age group. The situation changes rapidly among the over-60 age group, as men in particular and women aged over 65 are far less likely to be employed than are their contemporaries in other EU countries.

Chart 17
Productivity and hours worked (difference between 2019 and 2004)



Sources: Eurostat, and OECD.

Chart 18
Average hours worked per employee (number per year)

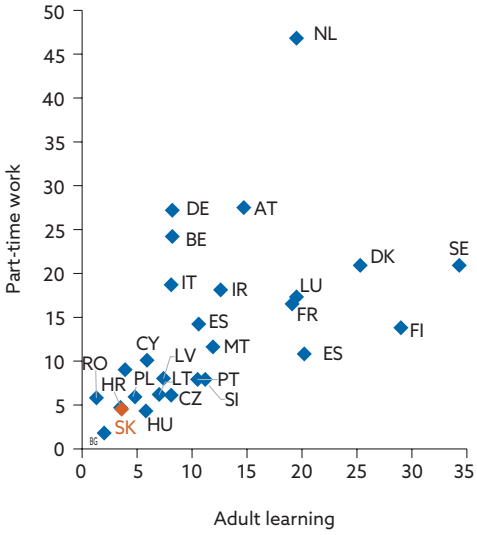


Source: OECD.

There are also pools of untapped labour among young people aged up to 25. After a brief uptrend, the youth employment rate has returned to a downward path and lags further behind the EU average. Slovakia, moreover, has a higher share of young people not in employment, education or training (NEETs). During the economic upswing, long-term unemployment decreased appreciably to just above the EU27 average.

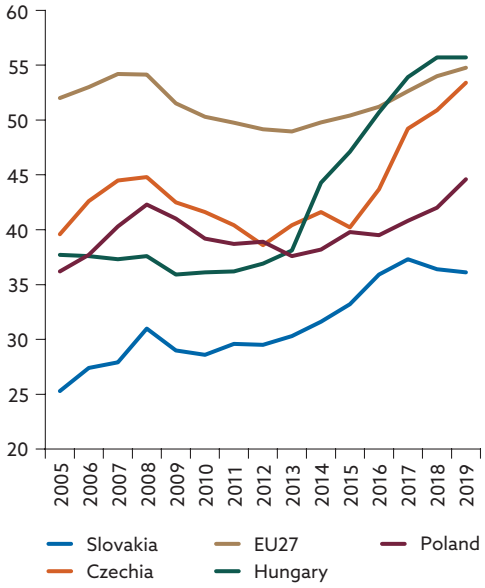
Part-time work and the adaptation of knowledge and skills to the needs of employers will increase people's chances of entering and remaining in employment. Across age cohorts and between genders there are no significant differences in the proportion of people not in part-time work. Expanding part-time work and strongly promoting adult learning are ways to help all sections of the working-age population and to broaden the productive workforce. In Slovakia, however, neither of these options is attracting significant attention.

Chart 19
Options for increasing employment (percentage)



Source: Eurostat.

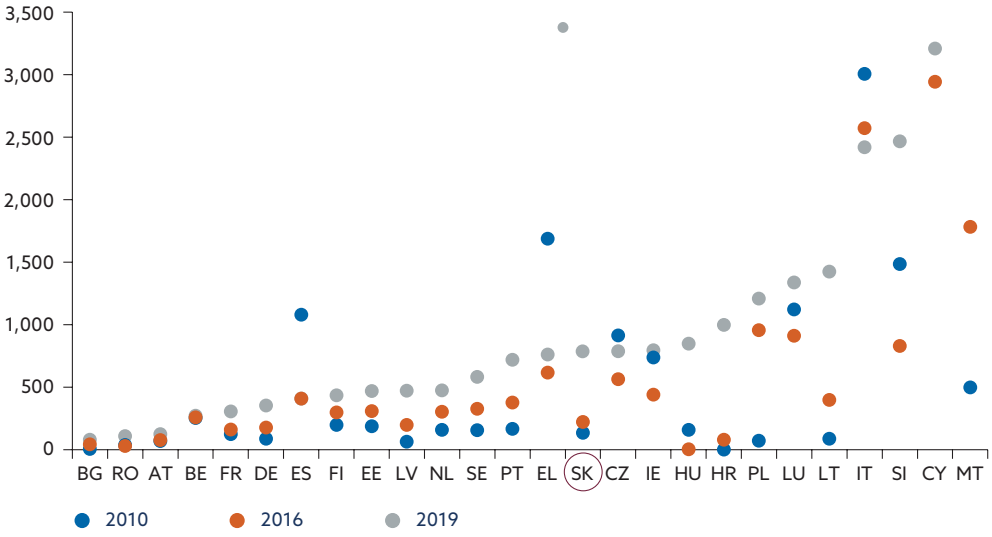
Chart 20
Employment rate of low-skilled persons (percentages)



Source: Eurostat.

Importing skilled workers from abroad can be a way to mitigate the consequences of the adverse demographic trend. The inflow of foreign workers to Slovakia in recent years has been necessitated by the labour market situation. Because of labour shortages in certain occupations, particularly in sectors with lower value added, the labour market has had to draw in more foreign labour.

Chart 21
Work permits (number per 100,000 inhabitants)



Source: Eurostat.

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Table 8 Labour market characteristics

Category	Indicator		2010	2015	2016	2017	2018	2019
Outcome indicator	Employment rate	SK	58.8	62.7	64.9	66.2	67.6	68.4
	(percentage) Source: Eurostat	EU average	63.1	65.2	66.2	67.7	69.0	69.9
Additional indicators	Participation rate	SK	68.7	70.9	71.9	72.1	72.4	72.7
	(percentage) Source: Eurostat	EU average	70.4	72.3	72.7	73.4	74.0	74.4
	Hours worked per employee	SK	1,805	1,754	1,740	1,714	1,704	1,695
	(hours per year) Source: OECD	OECD average	1,728	1,714	1,716	1,704	1,699	1,692
	Employment rate of age group 15–74	SK	53.8	56.5	58.2	59.2	60.1	60.6
	(percentage) Source: Eurostat	EU average	56.7	57.9	58.7	59.9	60.9	61.6
	Employment rate of age group 55–64	SK	40.5	47.0	49.0	53.0	54.2	57.0
	(percentage) Source: Eurostat	EU average	45.4	50.9	53.0	55.1	57.4	58.9
	Employment rate of women aged 15–39	SK	46.8	48.4	50.6	51.5	51.5	51.2
	(percentage) Source: Eurostat	EU average	56.1	57.2	57.7	59.0	59.8	60.2
	Part-time employment rate	SK	3.7	5.7	5.7	5.7	4.8	4.5
	(percentage) Source: Eurostat	EU average	13.7	14.5	14.5	14.2	13.9	13.7
	Youth employment rate for persons aged 15–24	SK	20.6	23.3	25.2	26.9	27.5	24.9
	(percentage) Source: Eurostat	EU average	31.2	31.4	32.0	33.2	34.1	34.3
	Young people not in employment, education or training	SK	14.1	13.7	12.3	12.1	10.2	10.3
	(percentage) Source: Eurostat	EU average	12.2	11.8	11.1	10.4	9.6	9.4
	Employment rate of low-skilled persons	SK	28.6	33.2	35.9	37.3	36.4	36.1
	(percentage) Source: Eurostat	EU average	50.3	50.4	51.2	52.6	54.0	54.8
	Long-term unemployment rate	SK	9.1	7.5	5.8	5.0	4.0	3.3
	(percentage) Source: Eurostat	EU average	4.3	4.9	4.2	3.5	2.8	2.3
	Participation rate of persons aged over 65	SK	1.6	2.6	2.7	3.6	4.0	4.6
	(percentage) Source: Eurostat	EU average	5.6	5.8	5.8	6.2	6.5	6.8
	Adult participation in learning	SK	3.1	3.1	2.9	3.4	4.0	3.6
	(percentage) Source: Eurostat	EU average	9.4	10.6	10.7	11.2	11.5	11.7

Category	Score	2010	2015	2016	2017	2018	2019
Outcome indicator	Employment rate	-0.76	-0.42	-0.23	-0.27	-0.25	-0.27
Additional indicators	Participation rate	-0.33	-0.33	-0.18	-0.30	-0.35	-0.39
	Hours worked per employee	0.38	0.20	0.12	0.05	0.03	0.01
	Employment rate of age group 15–74	-0.56	-0.27	-0.09	-0.13	-0.16	-0.20
	Employment rate of age group 55–64	-0.53	-0.39	-0.39	-0.21	-0.32	-0.19
	Employment rate of women aged 15–39	-1.26	-1.15	-0.93	-0.98	-1.02	-1.13
	Part-time employment rate	-1.06	-0.91	-0.90	-0.87	-0.93	-0.94
	Youth employment rate for persons aged 15–25	-0.91	-0.67	-0.57	-0.53	-0.54	-0.77
	Young people not in employment, education or training	-0.43	-0.43	-0.30	-0.44	-0.16	-0.29
	Employment rate of low-skilled persons	-2.12	-2.22	-1.92	-1.91	-2.15	-2.37
	Long-term unemployment rate	-1.95	-0.69	-0.48	-0.51	-0.45	-0.41
	Participation rate of persons aged over 65	-1.10	-1.10	-0.99	-0.83	-0.78	-0.68
	Adult participation in learning	-0.83	-0.93	-0.99	-0.99	-0.95	-0.96

Box 3
Which factors are affecting the unemployment rate?

The unemployment rate is significantly affected by several factors: the structural performance of the economy (in regard to both the growth and level of GDP); whether the economy is overheating or cooling; active labour market policies; demographic changes; and labour cost shocks. In a panel regression analysis of EU countries, these factors have been shown to be statistically significant (Karšay, A., "Štrukturálne a cyklické vplyvy na mieru nezamestnanosti" (Structural and cyclical impacts on the unemployment rate), 2021).

The most broadly defined of these factors is the economy's structural performance, which is underpinned by a number of factors. Everything we do to support the economy's long-term sustainable performance, including the adoption of effective reforms under Slovakia's recovery and resilience plan (RRP), has the potential to reduce the unemployment rate. Hence the need for the following: to help entrepreneurs focus more on their business and less on red tape; to enable children to have a high-quality education and opportunities for sporting and leisure activities (see, for example, the OECD's 2017 Health at a Glance report); to support, through sound investment, infrastructure improvement in less developed regions; and to have regard to key areas such as health, the environment, social issues, and the sustainability of public finances.

An economy can temporarily deviate from its equilibrium level, whether above (overheating – excessive investment and production) or below (cooling). Such changes naturally have an impact on the unemployment rate.

Active labour market policies can do much to reduce the unemployment rate. They help increase the chance of unemployed people finding permanent work. Should we let the unemployed manage by themselves or should we actively work with them and help them find work? The literature and our own analysis inclines to the second option (a recent extensive survey of the literature on this issue is provided in a paper by Card, Kluve and Weber (2018)[16]).

Activation policies should be effective. They are best applied to increasing the qualifications and skills of the long-term unemployed, or to supporting their temporary placement with employers that can train them and integrate them into the workplace. Other effective measures include actively helping jobseekers in their job searching, by providing career advice and job offers. Less effective, as the foreign literature shows, are activation works with no upskilling component.

When the size of the working-age population is falling, employers may resort to hiring less employable members of the workforce, so causing the unemployment rate to decrease. That

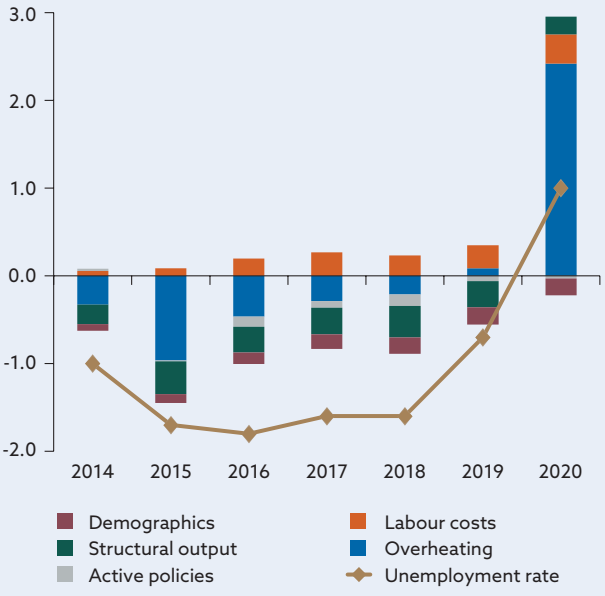
[16] Card, D., Kluve, J. and Weber, A., "What Works? A Meta Analysis of Recent Active Labor Market Program Evaluations", *Journal of the European Economic Association*, Vol. 16(3), European Economic Association, 2018, pp. 894–931.

is what is currently happening in Slovakia, where the population is ageing. Efforts should be made towards creating conditions for the employment of as many people as possible regardless of age.

Sharp increases in employers' labour costs without a commensurate growth in labour productivity can put upward pressure on the unemployment rate. For several years now, labour costs in Slovakia have not been as low as was long the widely held view. In the industry sector and in IT, finance and some other service sectors we have already virtually caught up with Western countries in terms of the ratio of labour costs to labour productivity.

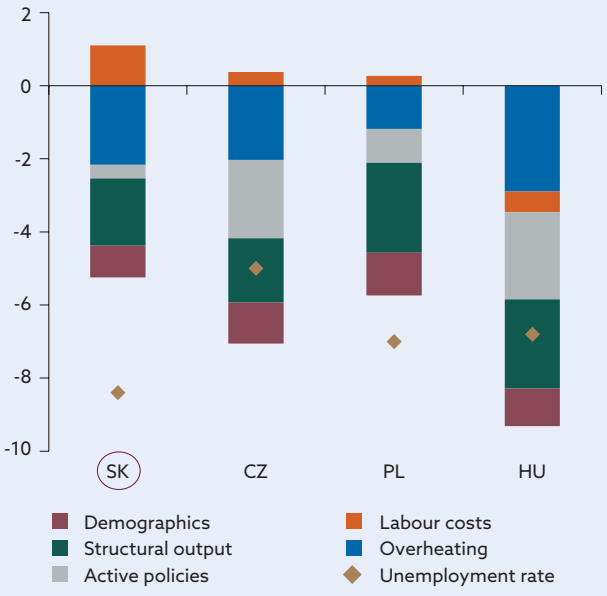
During the Slovak economy's expansion from 2014 to 2019, the unemployment rate was under constant downward pressure from factors such as increasing structural performance, a decreasing working-age population, and active labour market policies. Another major factor, however, was the cyclical increase in the economy's performance. The situation for firms was not entirely favourable, given the increase in the ratio of labour costs to value added.

Chart A
Changes in Slovakia's unemployment rate and its decomposition into factors as estimated by a panel regression (percentage points)



Source: NBS calculations.

Chart B
Changes in V4 countries' unemployment rates and contributions under a panel regression (percentage point changes between 2014 and 2019)



Source: NBS calculations.

During the pandemic crisis year of 2020, the business cycle began to turn; however, it is likely that **the increase in the unemployment rate has a partly structural, i.e. more permanent nature** (the adverse impact of serious crises on potential output and on equilibrium unem-

ployment in the labour market – so-called hysteresis – is examined, for example, in a paper by Cerra, Fatás and Saxena (2020).[17]

Compared with the other V4 countries, Slovakia experienced a sharper drop in unemployment, which not even model effects can explain precisely. The difference is partly accounted for by Slovakia's greater targeting of active labour market policies on more effective instruments, such as retraining and temporarily subsidised employment placements. Slovakia's economic expansion was low intensity in terms of capital investment and innovation. In other words, production growth was due more to the workforce than to innovation and investment in technology and fixed capital. This may be partly explained by the stagnation of the business environment during the period in question.

The good news for the future is that reform efforts in all areas of the economy can contribute to a permanent decline in the unemployment rate. They will not, however, be enough so long as Slovakia continues to have a relatively high number of long-term unemployed and marginalised communities. Their potential can be tapped by putting greater effort into effective active labour market policies. These can also help people who were laid off permanently because of the pandemic crisis. Reducing labour costs at least for low-income groups is a passive measure that can also have a downward impact on unemployment. The issue of marginalised communities has a broader scope and can also be addressed by policy instruments in areas other than the labour market (including housing, infrastructure, health, and education. We should be careful about further increases in labour costs relative to labour productivity.

Slovakia's percentage of the population aged 25–64 who have attained at least upper secondary education is higher than the EU average. The percentage having completed tertiary education has risen sharply in the past ten years, but has still not reached the EU average. Attention should be paid, however, to the increasing percentage of early leavers from education and training, which by the end of the period under review was almost up to the EU average. That the length of education in Slovakia is above the EU average is not unequivocally positive. Graduates in Slovakia are entering the labour market later. The lateness of their entry is depleting (narrowing) the available labour force, nor is it beneficial for the graduates themselves, since they start earning at an older age compared with their European peers.

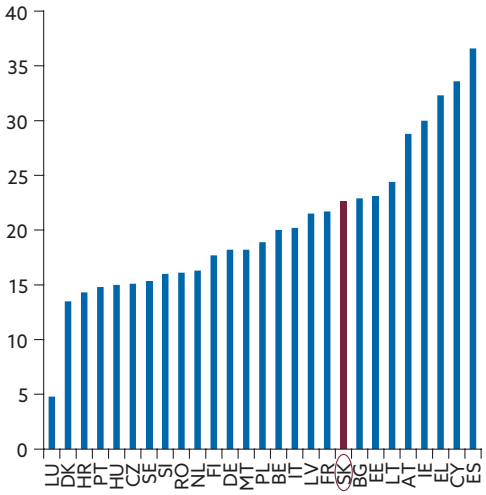
Assessments of quantitative outcomes become less positive in the context of labour market requirements as well as of the international asses-

[17] Cerra, V., Fatás, A. and Saxana, S.C., "Hysteresis and Business Cycles", *IMF Working Papers*, No 20/73, International Monetary Fund, May 2020.

sment of reading literacy. Slovakia reports the largest qualification mismatch rate in the EU27. Almost 38% of graduates work in a field different to that in which they gained their qualifications, and this situation is not improving. The mismatch rate is highest among graduates in agricultural, veterinary and social sciences, and lowest among graduates in the fields of engineering and construction.

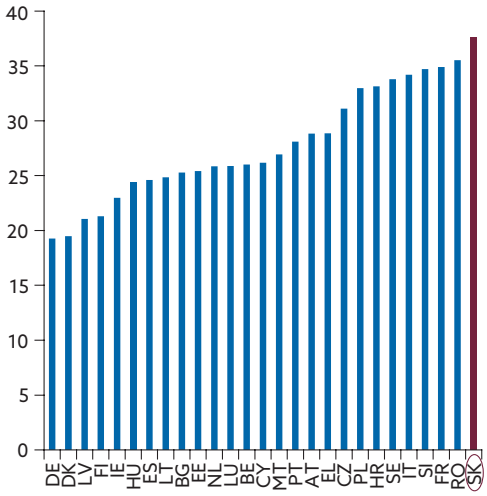
Employees in Slovakia are often overqualified for their jobs. The proportion of tertiary-educated people (graduates with at least a bachelor's degree) **who are working in jobs with lower educational requirements** is far higher than the EU27 average. Qualification mismatches not only mean an inefficient use of society's resources, but also have an adverse impact on labour productivity.

Chart 22
Graduates in jobs with lower educational requirements (percentages; 2019)



Source: European Commission.

Chart 23
Qualification mismatch rate (percentages, 2019)



Source: European Commission.

In the area of early childhood education (from four years old until the start of compulsory education), Slovakia is far behind the EU average. Extending the provision of state childcare facilities, or supporting private childcare facilities, would help integrate more women into the labour market (the employment rate for women under forty in Slovakia is low).

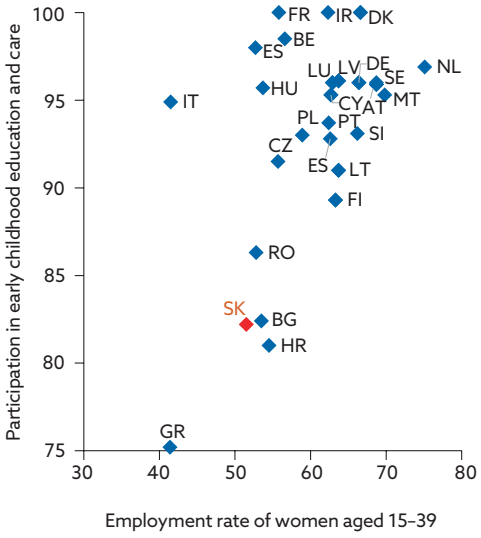
According to the Programme for International Student Assessment (PISA), which measures 15-year-olds' ability in reading, mathematics and science, students in Slovakia score below the OECD and EU27 averages in all three areas. Their weakest area is reading literacy. Among the V4 countries, Slovakia ranks lowest in all areas except for mathematics, in which it outperforms Hungary.

Table 9 Programme for International Student Assessment (PISA)						
Indicator		2006	2009	2012	2015	2018
Reading	SK	466	477	463	453	458
(score)	EU average	482	484	487	486	481
Science	SK	488	490	471	461	464
(score)	EU average	496	495	495	487	483
Mathematics	SK	492	497	482	475	486
(score)	EU average	490	489	488	487	488
Score		2006	2009	2012	2015	2018
Reading		-0.49	-0.29	-0.99	-1.27	-0.81
Science		-0.26	-0.20	-0.86	-1.02	-0.72
Mathematics		0.06	0.30	-0.25	-0.51	-0.08

Source: OECD.

Chart 24

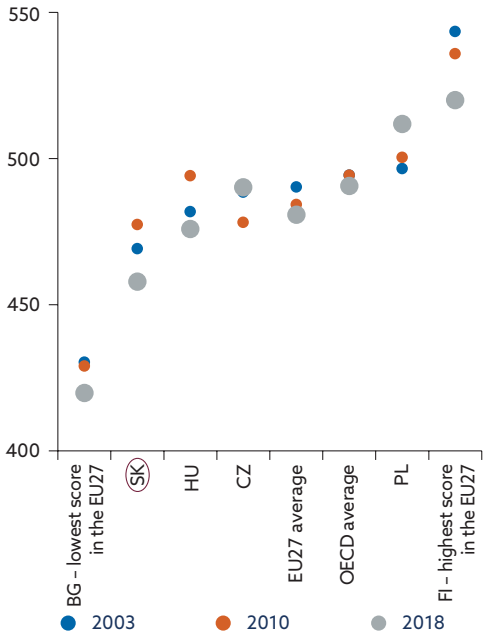
Employment rate of women and early childhood education and care (percentages)



Source: Eurostat.

Chart 25

PISA reading literacy performance



Source: PISA.

People's preparedness for the digital society is weaker in Slovakia than in the EU27 on average. The digital skills indicator measures basic and broader skills of internet users, including work with software, and also takes into account the number of ICT graduates and ICT specialists, including the proportion of women in these categories. Both the level of digital skills and the falling quality of labour in Slovakia are related to the quality of education and its alignment with the labour market.

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Table 10 Quality of human capital

Indicator		2010	2014	2015	2016	2017	2018	2019
Mean years of schooling	SK	11.6	12.3	12.5	12.6	12.6	12.6	12.7
(years) Source: UNDP	EU average	11.4	11.8	11.8	11.9	12.0	12.0	12.0
Early leavers from education and training	SK	4.7	6.7	6.9	7.4	9.3	8.6	8.3
(percentage) Source: Eurostat	EU average	12.1	9.8	9.8	9.4	9.4	9.1	8.9
Early childhood education and care	SK	76.9	77.4	78.4	76.5	78.2	82.2	
(percentage) Source: Eurostat	EU average	89.9	91.5	92.1	92.3	93.0	92.8	
Population aged 25–64 with at least upper secondary educational attainment	SK	91.0	91.0	91.4	91.9	91.4	91.7	91.4
(percentage) Source: Eurostat	EU average	74.7	78.1	78.6	79.4	80.0	80.7	81.4
Population aged over 25 with at least short-cycle tertiary educational attainment	SK	11.8	11.8	11.8	18.3	19.2	19.8	20.9
(percentage) Source: World Bank	EU average	22.9	24.6	25.3	26.6	26.9	27.5	29.0
Qualification mismatch rate	SK	10.0	18.7	21.3	21.2	22.2	23.7	22.6
(percentage) Source: Eurostat	EU average	17.0	19.4	20.0	20.0	20.1	20.4	20.4
Skills mismatch rate	SK		36.7	39.7	40.4	38.2	39.2	37.6
(percentage) Source: Eurostat	EU average		27.6	27.8	28.6	28.0	28.2	27.9
Employment rate of recent graduates	SK	69.4	72.7	75.2	79.6	81.5	83.4	83.9
(percentage) Source: Eurostat	EU average	76.5	74.8	75.9	78.2	79.7	81.8	82.2
Public expenditure on education	SK	100	125	137	141			
(USD at constant prices; per capita at PPP) Source: OECD	EU average	231	256	265	272			
Connection to the internet – all types of households	SK	67.0	78.0	79.0	81.0	81.0	81.0	82.0
(percentage) Source: Eurostat	EU average	66.2	77.7	79.9	82.1	84.1	85.9	87.9
Connection to the internet – households with children	SK	86.0	96.0	96.0	96.0	97.0	95.0	96.0
(percentage) Source: Eurostat	EU average	84.4	93.0	94.4	95.7	96.6	97.0	97.6
Digital skills [1)]	SK		37.0	39.0	40.6	42.9	44.2	41.8
(score: 0–100) Source: European Commission	EU average		43.9	44.6	45.4	47.3	47.8	49.3

Score	2010	2014	2015	2016	2017	2018	2019
Mean years of schooling	0.10	0.48	0.58	0.60	0.61	0.61	0.61
Early leavers from education and training	1.14	0.63	0.63	0.45	0.02	0.13	0.17
Early childhood education and care	-1.43	-1.98	-2.03	-2.40	-2.58	-1.68	
Population aged 25–64 with at least upper secondary educational attainment	1.03	0.96	0.98	0.99	0.93	0.94	0.89
Population aged over 25 with at least short-cycle tertiary educational attainment	-1.46	-1.67	-1.74	-1.12	-1.12	-1.16	-1.14
Qualification mismatch rate	1.00	0.10	-0.19	-0.17	-0.29	-0.47	-0.31
Skills mismatch rate	0.00	-1.52	-2.09	-2.42	-1.84	-2.14	-1.86
Employment rate of recent graduates	-0.76	-0.18	-0.06	0.13	0.17	0.18	0.21
Public expenditure on education	-0.80	-0.69	-0.71	-0.70			
Connection to the internet – all types of households	0.07	0.02	-0.09	-0.12	-0.38	-0.80	-1.04
Connection to the internet – households with children	0.06	0.49	0.33	0.08	0.13	-0.81	-0.81
Digital skills [1)]		-0.62	-0.49	-0.42	-0.37	-0.29	-0.59

Note: 1) Data for the period 2015–2020.

The labour market is facing several challenges. Based on the results of international and domestic studies,[18] the **labour market situation in Slovakia in 2030** may be projected to include the following features:

- a three-to-one ratio of the working-age population to the elderly population (down from almost five-to-one today);
- 10% of jobs replaced with robots; a further 62% at risk from robotisation;
- 20–30% of jobs at risk from the dual – digital and green – transformations, with jobs in car manufacturing being most at risk;
- 30% of jobs requiring increased skill levels;
- less need for low-skilled workers (particularly in extraction industries, trade, health care, and social services);
- 40% of jobs unknown to us today;
- today's schoolchildren to be entering the labour market with (on average) below-average skills in reading literacy, mathematics and science;
- a generation marked by school closures to be entering the labour market;
- possibly a rising outflow of best graduates abroad.

[18] Georgieff, A. and Milanez, A., "What happened to jobs at high risk of automation?", *OECD Social, Employment and Migration Working Papers*, No 255, 2012; *Prognóza populačného vývoja Slovenskej republiky do roku 2060* (Forecast of population trends in the Slovak Republic), Infostat, 2013; Nedelkoska, L. and Quintini, G., "Automation, skills use and training", *OECD Social, Employment and Migration Working Papers*, No 202, 2018; *Education at a Glance 2019*, OECD, 2019; *The 2019 Ageing Report*, European Commission, 2019.

5 Economic vulnerabilities

The Slovak economy's vulnerabilities stem mainly from the unsustainability of public finances. Risks going forward may also, however, include loss of competitiveness, rapid household debt growth, and financial crisis repercussions on the banking sector. We examine the economic vulnerabilities in three main areas: macroeconomic stability (internal equilibrium), competitiveness (external equilibrium) and the sustainability of public finances. The largest risks lie in the projected public finance developments, particularly in the impact of the rapidly ageing domestic population.

5.1 Macroeconomic stability

Although Slovakia's economy contracted sharply in 2020, the downturn was somewhat less severe compared with the EU average. At the same time, however, the long-term impacts of the pandemic crisis represent a risk to the economy's potential output. The crisis constituted a major shock on the economy's supply and demand sides, as government containment measures and supply chain disruptions reduced the economy's productive capacity and as uncertainty and falling incomes had a downward impact on consumer spending. The resulting contraction in 2020 comprised both a decline in potential output growth and a cooling of the economy. Although large, the Slovak economy's output gap of 4.6% of GDP was slightly lower than the EU average. Once the pandemic crisis has abated, the economy is expected to return quite rapidly to potential. The pandemic, however, has also had effects of a more permanent nature on the business sector, labour market, and consumer behaviour. These are expected to have an adverse impact on potential output, whose projected growth between 2019 and 2022 was a full two percentage points lower in NBS's March 2021 Medium-Term Forecast than in its December 2019 Medium-Term Forecast (Chart 26).

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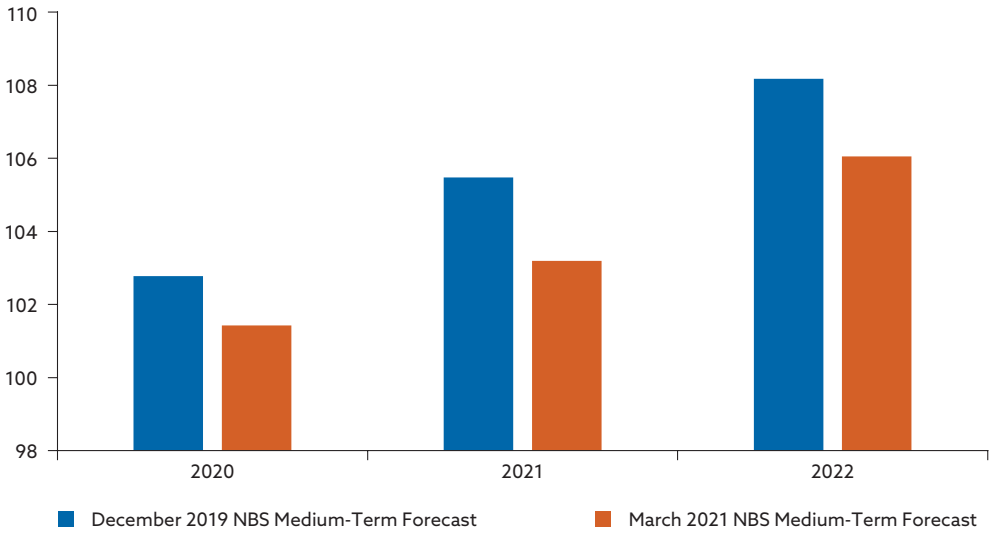
Chart 26
Projection for potential output (index: 2019 = 100)

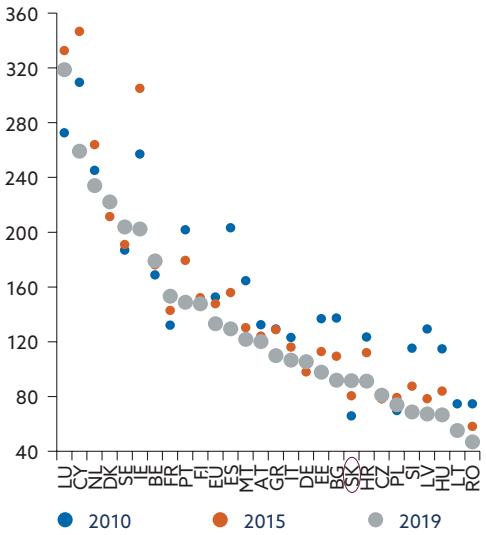


Source: NBS.

Private sector indebtedness in Slovakia is not yet as high as the EU average, but its rapid growth is concerning. Compared with the EU average, Slovakia's private sector indebtedness in 2019 was lower, but compared with the other V4 countries, it was the highest. The risk lies also in the pace of its increase, which in comparison with 2012 was among the highest in the EU. Its acceleration since then has been driven mainly by household borrowing coupled with relatively dynamic growth in the property market. In response to this trend, NBS adopted measures that partly checked the rise in private indebtedness.

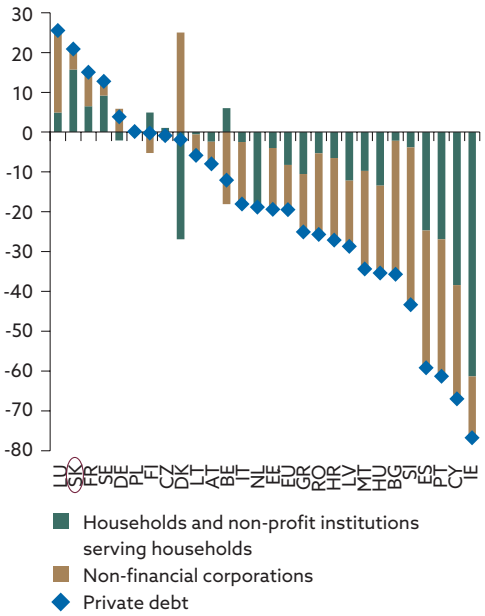
By European standards, the Slovak banking sector was resilient in the pre-pandemic period. Its aggregate non-performing loan (NPL) ratio was below the EU average. The sector's relatively low leverage had a positive impact on its resilience and, to a similar extent, so did its exposure to Slovak government debt, which is limiting the effects on the sector of any fiscal sustainability risks. As regards its soundness, however, the sector may be more negatively assessed for its below average profitability and the downtrend in that indicator.

Chart 27
Private debt (percentage of GDP)



Source: Eurostat.

Chart 28
Change in private sector debt between 2012 and 2019 (percentage of GDP)



Source: Eurostat.

While the financial sector may face difficulties related to the pandemic crisis fallout, it is not expected to be put at serious risk. The risk lies mainly in the deteriorating financial situation of households and firms (government support notwithstanding) and a resulting uptrend in loan delinquencies. That scenario is expected to put downward pressure on banks' profitability. **Nevertheless, the Bank does not expect that the stability of the banking sector or other financial institutions will be significantly disrupted.**[19]

[19] More detailed information on financial stability developments and potential repercussions in this area is provided in the Bank's November 2020 Financial Stability Report.

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Table 11 Internal imbalance

Category	Indicator		2010	2015	2016	2017	2018	2019	2020
Outcome indicators	Output gap	SK	-0.9	-0.6	-0.1	1.3	3.4	3.9	-4.6
	(percentage of potential GDP) Source: Ameco	EU average	-2.8	-1.3	-0.5	1.1	2.1	2.6	-5.3
	Private sector debt	SK	65.7	80.5	88.2	94.0	90.8	91.6	
	(percentage of GDP) Source: Eurostat	EU average	152.5	147.7	145.1	140.0	136.7	133.1	
	Non-performing loans	SK		4.4	4.6	3.7	3.2	2.9	
	(percentage) Source: Eurostat	EU average		10.4	9.1	7.5	5.9	4.9	
Additional indicators	Private sector credit flow	SK	23.5	15.0	19.3	23.9	20.8	16.6	
	(percentage of GDP over three years) Source: Eurostat	EU average	17.9	4.2	6.7	9.2	11.8	11.7	
	Real house prices (three-year percentage change)	SK	-6.5	6.6	14.6	17.9	17.3	16.4	
	Source: Eurostat	EU average	-11.3	3.6	9.9	12.3	13.2	12.9	
	Banking leverage	SK	10.4	9.0	9.2	9.3	9.5	9.6	
	(assets-to-equity multiple) Source: Eurostat	EU average	15.4	12.3	12.2	11.6	11.7	11.9	
	Banks' exposures to domestic sovereign debt	SK	18.8	14.3	12.7	10.2	9.5	8.9	
	(percentage of GDP) Sources: ECB, NBS calculations	EU average	15.7	15.8	14.8	13.4	13.0	12.2	
	Bank sector profitability (ROE)	SK	8.6	6.6	3.7	5.9	6.4	5.0	
	(percentage) Source: ECB	EU average	-2.4	4.4	6.3	6.6	8.1	7.3	

Category	Score	2010	2015	2016	2017	2018	2019	2020
Outcome indicators	Output gap	0.69	0.65	0.60	0.32	-0.46	-0.60	0.27
	Private sector debt	1.33	0.83	0.74	0.63	0.64	0.60	
	Non-performing loans		0.56	0.43	0.40	0.34	0.29	
Additional indicators	Private sector credit flow	-0.32	-0.79	-0.95	-1.19	-0.72	-0.47	
	Real house prices	-0.32	-0.25	-0.41	-0.57	-0.47	-0.41	
	Banking leverage	0.97	0.88	0.84	0.68	0.67	0.73	
	Banks' exposures to domestic sovereign debt	-0.38	0.17	0.25	0.43	0.43	0.43	
	Bank sector profitability (ROE)	0.32	0.27	-0.38	-0.13	-0.38	-0.57	

Notes: The output gap score was calculated from the gap's absolute value. Bank sector indicators include data for foreign bank branches.

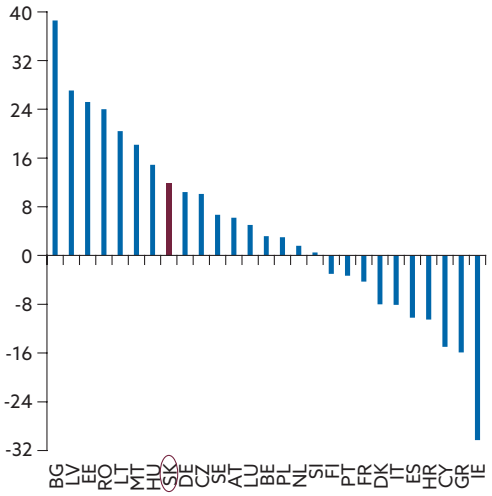
5.2 Competitiveness

Recent years have seen an increase in Slovakia's external imbalance, which, in the context of monetary union, may make the process of reducing it len-

gthy and costly. With prices and wages accelerating faster in Slovakia than in its trading partners, the country has been reporting trade deficits. Restoring competitiveness under the conditions of a fixed exchange rate, i.e. the single currency, can only be achieved with a relative decrease in prices and wages vis-à-vis trading partners. Looking at the experience of several euro area countries following the great financial crisis, it seems that the process of restoring external equilibrium may be lengthy and costly.[20]

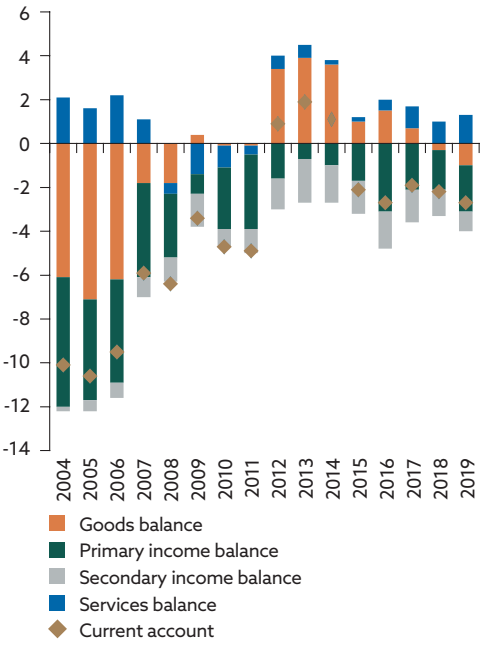
Evidence of a loss of competitiveness is provided by trends in unit labour costs, the real effective exchange rate, and export market shares. Slovakia has for a long time benefited from its low labour costs. At the same time, as a euro area member, Slovakia has not been exposed to exchange rate appreciation in the way that it was before adopting the single currency. Since 2015, however, unit labour cost growth in Slovakia has been outpacing the EU average. Like many central and eastern European countries Slovakia saw its unit labour costs increase relative to the euro area average between 2009 and 2019 (Chart 29). A future problem for competitiveness may be that the real effective exchange rate, after depreciating relatively sharply in the years after the great financial crisis, is now appreciating moderately. Another problem is the slowdown in the comparatively low growth in export market shares and the adverse trends in terms of trade, i.e. in export prices relative to import prices.

Chart 29
Change in unit labour costs relative to the euro area between 2010 and 2020



Source: Eurostat.

Chart 30
Balance of payments current (percentage of GDP)



Source: Eurostat.

[20] The issue of competitiveness in the monetary union is examined in more detail in Annex 1 (Section 10.1).

This situation is also reflected in the balance of payments current account, where only trade in services remains in surplus. In the aftermath of the great financial crisis, the trade balance recorded relatively high surpluses, largely on the back of trade in goods. A loss of competitiveness is also evident in the balance of payments, as trade in goods has accounted for increasing current account deficits and only trade in services remains in surplus.

Table 12 External equilibrium

Category	Indicator		2010	2015	2016	2017	2018	2019	2020
Outcome indicators	Real effective exchange rate (PPI-deflated)	SK	2.7	-3.0	-5.1	-5.2	-0.8	0.0	1.2
	(three-year percentage change) Source: ECB	EU average	-0.9	-2.7	-3.3	-2.3	2.4	1.3	0.6
	Nominal unit labour costs	SK	8.8	2.8	4.2	8.1	11.4	14.5	15.5
	(three-year percentage change) Source: Eurostat	EU average	9.8	1.7	2.3	3.9	7.4	8.7	12.0
Additional indicators	Export market shares	SK	3.8	3.9	7.2	5.0	2.2	1.9	
	(five-year percentage change) Source: Eurostat	EU average	0.1	0.2	5.4	12.2	10.6	9.5	
	Terms of trade	SK	-5.9	-3.2	-2.3	-1.6	-1.7	-2.0	-2.1
	(five-year percentage change) Source: Eurostat	EU average	1.3	1.4	3.2	3.5	2.5	2.2	1.5
	Current account balance	SK	-4.9	0.3	-1.2	-2.2	-2.3	-2.3	
	(three-year average, percentage of GDP) Source: Eurostat	EU average	-2.4	1.7	1.7	1.8	1.7	1.7	
	Net investment position	SK	-11	-14	-15	-15	-17	-14	
	(percentage of GDP) Source: Eurostat	EU average	-94	-164	-155	-161	-146	-154	
	Net external debt	SK	20	29	29	32	34	32	
	(percentage of GDP) Source: Eurostat	EU average	-101	-38	-43	-48	-53	-76	

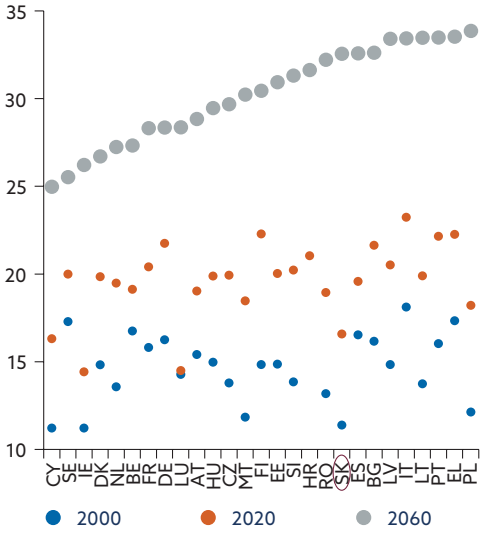
Category	Score	2010	2015	2016	2017	2018	2019	2020
Outcome indicators	Real effective exchange rate (PPI-deflated)	-0.99	0.07	0.38	0.93	1.19	0.39	-0.21
	Nominal unit labour costs	0.12	-0.14	-0.28	-0.59	-0.56	-0.84	-0.54
Additional indicators	Export market shares	0.21	0.28	0.12	-0.45	-0.52	-0.52	
	Terms of trade	-1.17	-2.21	-2.13	-2.04	-1.81	-1.68	-1.46
	Current account balance	-0.44	-0.49	-1.00	-1.29	-1.20	-1.09	
	Net investment position	0.23	0.21	0.20	0.19	0.19	0.19	
	Net external debt	-0.21	-0.17	-0.19	-0.21	-0.22	-0.23	

Note: A positive value for the real effective exchange rate denotes exchange rate appreciation.

5.3 Public finance sustainability

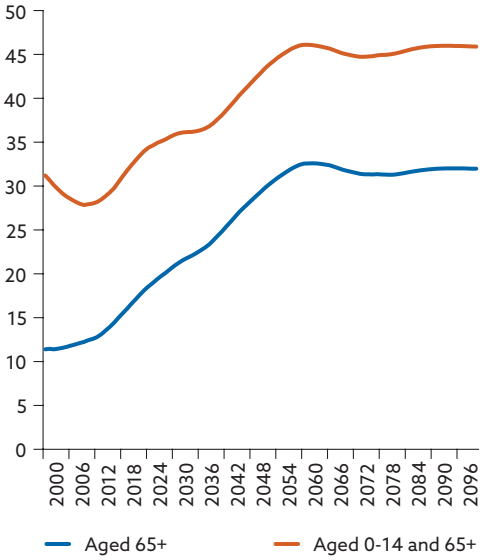
Demographic trends in Slovakia over coming decades will include a dependency ratio increase that is the highest in the EU. In 2000 the over-65 age group made up 11% of Slovakia's population, but by 2060 its share will have almost tripled. From having the youngest population in the EU, Slovakia will over the next decade become a country in which a large share of the population are not of working-age and which will be increasingly reliant for revenues on a steadily shrinking working-age population.

Chart 31
Dependency ratios in EU countries



Sources: Eurostat, and NBS calculations.

Chart 32
Dependency ratio in Slovakia

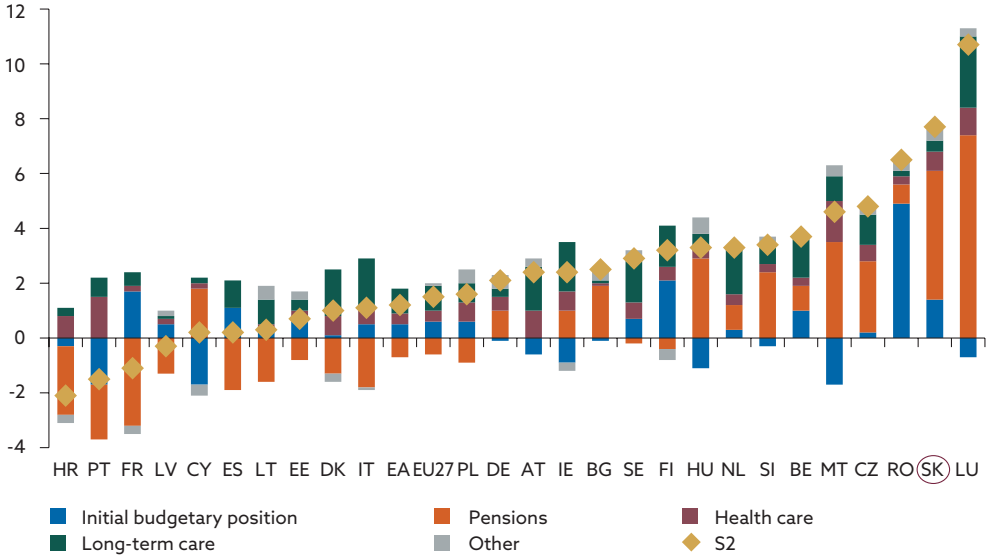


Sources: Eurostat, and NBS calculations.

Costs related to population ageing are seriously increasing risks to the long-term sustainability of public finances. According to the European Commission, the S2 indicator[21] rose to 7.7% of GDP in 2019, so indicating a high risk to debt sustainability. In terms of their sustainability, public finances in Slovakia are the second worst in the EU (Chart 33). The risks stem mainly from a rapidly ageing population and the unsustainable configuration of the pension system. At the same time, the current public finance deficit is creating a difficult starting point for future gradual deleveraging.

[21] This indicator shows the adjustment to the current structural primary balance required to stabilise public debt.

Chart 33
Decomposition of the S2 fiscal sustainability gap indicator (2020)



Source: European Commission.

In terms of its current level, structure and servicing costs, Slovakia's public debt is relatively sound and may therefore be masking the size of the challenges in the area of public finance. Slovakia's public debt is relatively low by international standards. Its structure is similarly favourable – only a relatively low share of the debt has a short-term maturity. The debt servicing costs are also low.

In view of the considerable costs related to population ageing and the now sizeable public finance deficit, fiscal consolidation measures will need to be adopted once the economic fallout from the pandemic has faded.

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Table 13 Fiscal sustainability

Category	Indicator		2010	2015	2016	2017	2018	2019	2020
Outcome indicator	Sustainability of public finances (S2 indicator)	SK	10.4	3.5	2.4	2.4	2.5	3.8	7.7
	(percentage of GDP) Source: European Commission	EU average	6.8	2.2	2.1	1.9	2.3	2.4	2.4
Additional indicators	Gross public debt	SK	41.0	51.9	52.4	51.7	49.9	48.5	
	(percentage of GDP) Source: Eurostat	EU average	60.6	70.9	70.1	67.3	65.4	63.4	
	Gross public debt with a residual maturity of less than one year	SK	4.7	3.6	4.5	2.3	3.7	4.0	
	(percentage of GDP) Source: ECB	EU average	11.6	11.4	11.7	10.4	11.0	10.4	
	Gross public debt with a residual maturity of one to five years	SK	17.3	16.6	12.6	9.8	12.3	11.8	
	(percentage of GDP) Source: ECB	EU average	22.9	22.7	22.8	21.7	20.5	20.4	
	Ten-year government bond yields	SK	3.9	0.9	0.5	0.9	0.9	0.3	0.0
	(percentage) Source: Eurostat	EU average	4.8	1.9	1.6	1.6	1.5	0.8	0.4

Category	Score	2010	2015	2016	2017	2018	2019	2020
Outcome indicator	Sustainability of public finances (S2 indicator)	-0.87	-0.66	-0.15	-0.26	-0.07	-0.55	-1.83
Additional indicators	Gross public debt	0.60	0.49	0.46	0.41	0.39	0.38	
	Gross public debt with a residual maturity of less than one year	0.78	0.93	0.85	1.00	0.87	0.83	
	Gross public debt with a residual maturity of one to five years	0.46	0.59	0.97	1.13	0.76	0.78	
	Ten-year government bond yields	0.47	0.53	0.58	0.48	0.52	0.52	0.51

6 Social inclusion

The risk of poverty in Slovakia is relatively low across categories of gender, age, and economic activity. Compared with the EU average, Slovakia reports lower risks of poverty for all the surveyed categories of age group, gender, and economic activity.

The risk of poverty is naturally lowest among employed people. The at-risk-of-poverty (AROP) rate for employed people is also closer to the EU average than are the rates for other categories. The gap between Slovakia and the EU average is greater in terms of the AROP rates for the total population, for pensioners, and for people not in employment.

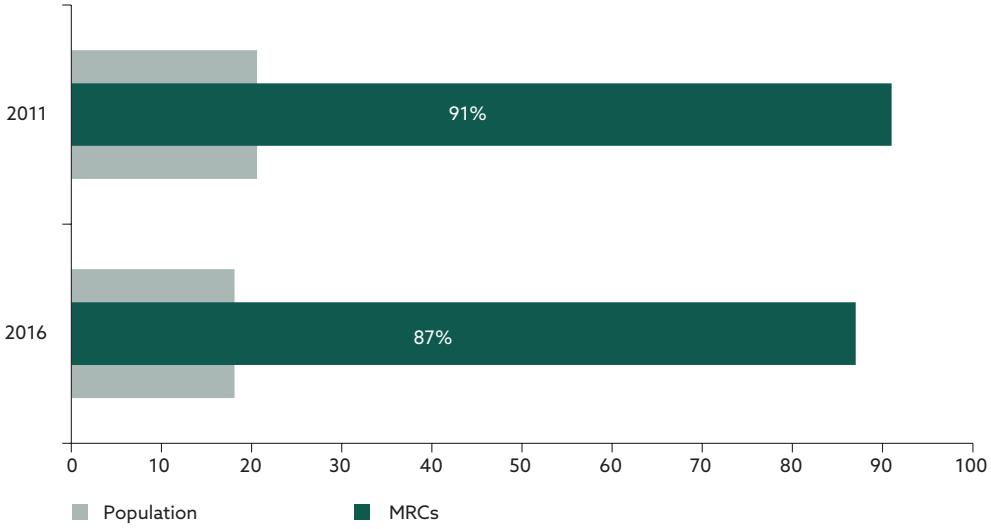
A notable improvement took place between 2010 and 2015. This was followed by a period of stagnation, during which the only improvement in the AROP rate relative to the EU average was a gradual and steady one for employed people. Compared with the EU average, the lowest-risk group is retired people aged under 60, comprising mainly recipients of service pensions. In Slovakia, such pensions are awarded at a comparatively early age and are generous by domestic standards.

The AROP rate is notably higher among the marginalised Roma communities (MRCs). At the same time, however, the rate for MRCs improved by 4.0 percentage points between 2011 and 2016, while the rate for the whole population improved by 2.5 percentage points.

People in employment are the segment of the population at least risk of falling into poverty. Pensioners have the next lowest AROP rate, although in 2019 their risk of poverty increased and drew closer to the EU average.

Chart 34

AROP rates for Slovakia's marginalised Roma communities and its whole population



Source: Eurostat, and FRA.

As for the material deprivation rate in Slovakia, it is lower than the AROP rate in all categories except for households with two adults including at least one aged over 65. The gap is most pronounced among households with two adults and three or more dependent children – standing as high as 26.6 percentage points. This means that the risk of poverty often does not materialise and is not reflected in such a way that households could not in fact afford three or more basic living items included in the material deprivation survey.

The material deprivation rate in Slovakia is approximately at the level of the EU average. In other words, the difference between the material deprivation rate and the AROP rate is even greater across the EU as a whole than in Slovakia.

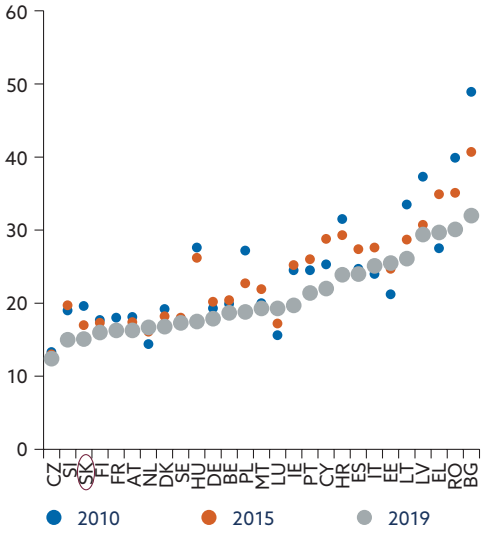
Table 14 People at risk of poverty, by economic activity; people at risk of material deprivation

Indicator		2010	2014	2015	2016	2017	2018	2019
Risk of poverty – population	SK	19.6	17.3	17.0	16.7	14.8	14.5	15.1
(percentage)	EU average	24.0	24.2	23.7	23.3	22.4	21.4	20.8
Risk of poverty – employed	SK	11.1	9.7	9.9	10.1	9.0	8.4	7.4
(percentage)	EU average	13.4	13.1	12.7	12.3	11.8	10.8	10.4
Risk of poverty – not employed	SK	29.2	26.6	25.8	25.4	23.3	23.2	25.7
(percentage)	EU average	35.5	35.7	35.5	35.3	34.5	34.0	33.6
Risk of poverty – retired	SK	18.6	14.3	13.6	13.1	12.8	12.2	14.4
(percentage)	EU average	24.1	21.8	22.0	22.4	22.5	22.9	23.1
Risk of poverty – retired and aged under 60	SK	54.2	45.0	44.7	42.9	22.0	12.8	18.8
(percentage)	EU average	57.1	61.0	57.9	58.6	54.3	52.8	53.6
Material deprivation	SK	-	18.5	16.7	15.3	13.3	12.2	11.4
(percentage)	EU average	-	21.0	18.7	17.0	15.5	13.8	12.7
Score		**2010**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Risk of poverty – population		0.53	1.02	0.98	0.97	1.14	1.20	1.08
Risk of poverty – employed		0.29	0.55	0.48	0.36	0.48	0.53	0.70
Risk of poverty – not employed		0.69	1.20	1.17	1.20	1.30	1.25	0.98
Risk of poverty – retired		0.44	0.72	0.73	0.81	0.81	0.84	0.69
Risk of poverty – retired and aged under 60		0.30	1.92	1.36	1.83	3.13	3.02	2.84
Material deprivation		-	0.19	0.15	0.13	0.19	0.17	0.15

Source: Eurostat.

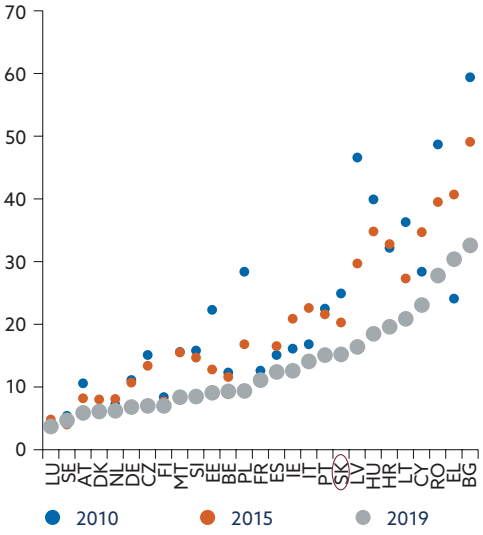
Slovakia's position among EU27 countries differs considerably between metrics. In 2019 Slovakia ranked third in the EU27 for risk of poverty and 19th for material deprivation of three or more basic living items. In the case of material deprivation, the countries with a worse position included those with sizeable MRCs: Romania, Bulgaria, Greece and Hungary.

Chart 35
Risk of poverty in EU countries (percentages)



Source: Eurostat.

Chart 36
Material deprivation in EU countries (percentages)



Source: Eurostat.

Single parent households are the households most at risk of poverty, while families with three or more children are in a slightly better position. The AROP rate for single parent households is on a par with the EU average, while the rate for families with three or more children is appreciably lower. At the same time, looking also at the economic activity breakdown of people at risk of poverty, the period 2010–15 saw a significant improvement for all types of households apart from families with three or more children.

Since 2015, the average risk of poverty in the EU has been successfully reduced, whereas the risk of poverty in Slovakia has remained flat, except for single pensioners and for families with two children.

The risk of poverty for single pensioner households has deteriorated notably since 2015 and is now worse than it was in 2010. Their risk of poverty is around half of the EU average.

For families with two adults and one dependent child and those with two adults and two dependent children, the risk of poverty fell substantially between 2014 and 2019, by 6.5 and 3.5 percentage points respectively. A contrasting trend was observed among households with two adults and three or more dependent children, as their risk of poverty increased by 6.0 percentage points during the period under review. In other words, the category of households with three or more children included an increasing share of lower-income households.

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Table 15 People at risk of poverty, by type of household

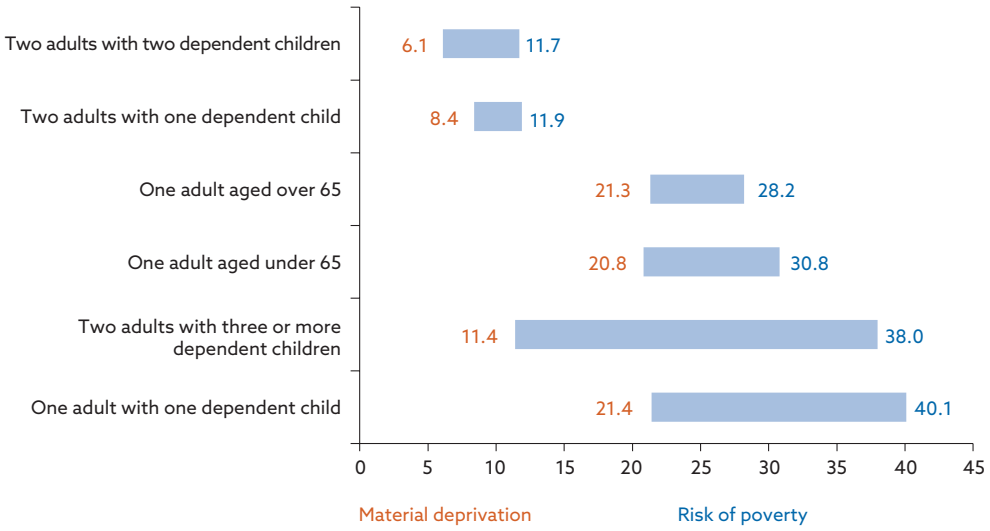
Indicator		2010	2014	2015	2016	2017	2018	2019
Risk of poverty – one adult aged under 65	SK	38.2	31.0	28.3	28.7	30.7	27.9	30.8
(percentage)	EU average	40.6	39.9	39.6	38.5	38.1	35.9	34.5
Risk of poverty – one adult aged over 65	SK	26.8	21.4	18.9	16.6	17.7	19.7	28.2
(percentage)	EU average	34.0	31.2	32.3	33.2	34.1	35.8	36.4
Risk of poverty – one adult with one dependent child	SK	44.1	39.0	39.1	40.7	45.0	45.7	40.1
(percentage)	EU average	49.9	49.1	47.8	47.7	45.9	44.6	41.9
Risk of poverty – two adults with one dependent child	SK	17.7	18.4	12.5	12.3	12.3	14.2	11.9
(percentage)	EU average	19.1	19.3	18.2	17.4	16.6	15.4	14.9
Risk of poverty – two adults with two dependent children	SK	13.4	15.2	18.5	17.3	15.7	16.3	11.7
(percentage)	EU average	19.5	18.8	18.2	17.7	16.3	15.0	14.2
Risk of poverty – two adults with three or more dependent children	SK	33.7	32.0	37.9	37.7	35.4	37.7	38.0
(percentage)	EU average	33.9	35.9	35.2	33.9	31.8	29.0	28.9

Score	2010	2014	2015	2016	2017	2018	2019
Risk of poverty – one adult aged under 65	0.26	1.27	1.68	1.43	1.10	1.12	0.68
Risk of poverty – one adult aged over 65	0.42	0.57	0.71	0.87	0.86	0.83	0.44
Risk of poverty – one adult with one dependent child	0.56	1.08	1.13	0.76	0.13	-0.18	0.26
Risk of poverty – two adults with one dependent child	0.17	0.14	0.90	0.75	0.71	0.25	0.61
Risk of poverty – two adults with two dependent children	0.66	0.42	-0.04	0.04	0.08	-0.18	0.39
Risk of poverty – two adults with three or more dependent children	0.01	0.22	-0.16	-0.22	-0.22	-0.72	-0.68

Source: Eurostat.

Chart 37

Material deprivation and risk of poverty in Slovakia in 2019, by type of household (percentages)



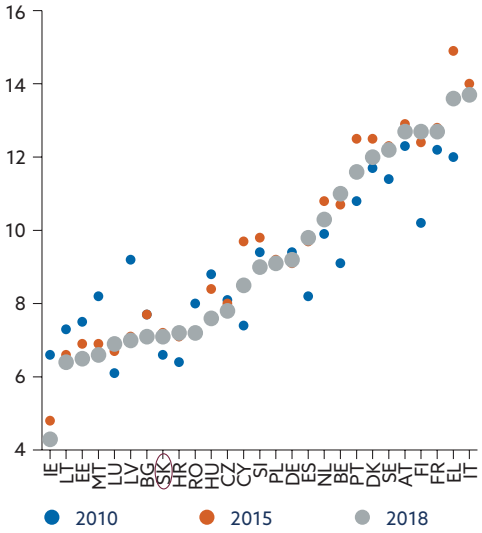
Source: Eurostat.

Social protection measures in Slovakia are predominantly in the form of cash benefits, with other forms of assistance provided at low levels. There

is a particularly obvious absence of other forms of support in the areas of unemployment and family policy – where cash benefits are not always what the benefit recipient actually needs.

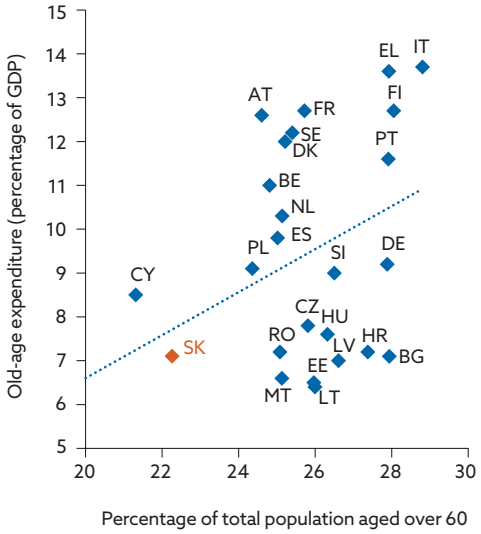
Compared with the EU average, Slovakia spends less than all other EU countries on old-age and unemployment protection. These types of expenditure are, however, highly dependent on the demographic and labour market situations. Relative to the population aged over 60 as a share of the total population, social protection expenditure on old age is only slightly below the EU average, and the expected ageing of the population will gradually be translated into an increase in the total amount of that expenditure.

Chart 38
Old-age expenditure in EU countries (percentage of GDP)



Source: Eurostat

Chart 39
Old-age expenditure vis-à-vis the share of the population aged over 60



Source: Eurostat

Disability expenditure in Slovakia amounts to approximately 1.5% of GDP. The care allowance accounts for a significant part of that expenditure and has in recent years been increased several times, up to around the level of the net minimum wage. Partly because of these increases, Slovakia's disability expenditure in 2018 was only 0.2 percentage point of GDP below the EU average, whereas in 2010 the gap was 0.5 percentage point.

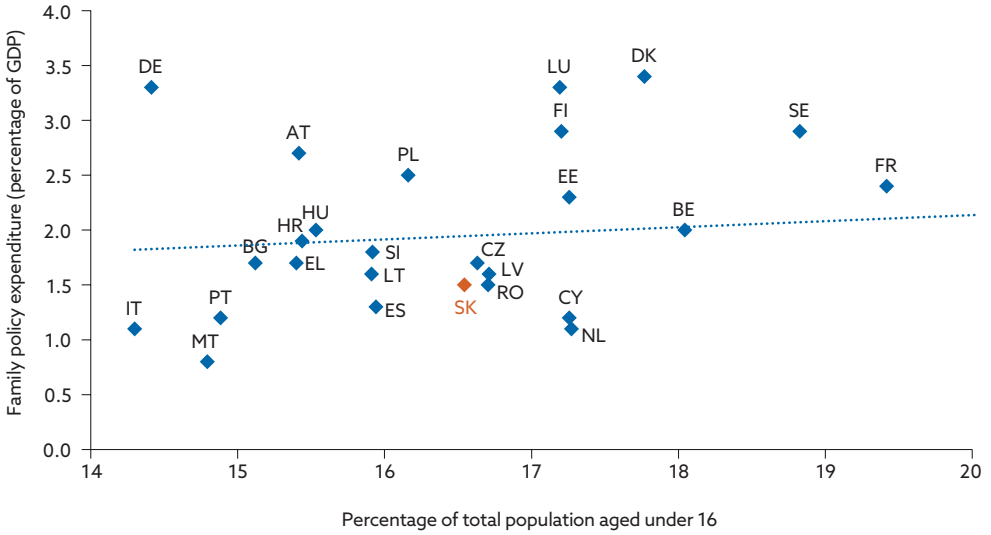
Expenditure on family policy fell by 0.2 percentage point of GDP between 2013 and 2018, during which period the EU average remained flat. In these years, family policy benefits were indexed only to the inflation rate for low-income households, which was markedly lower than Slovakia's GDP growth. It must also be noted that the parental allowance was increased in 2020, up to a level approaching the EU average. **Family policy expenditure in Slovakia is predominantly in the form of cash benefits.** Family policy expenditure on items other than cash benefits constitutes a mere 0.1% of GDP, in contrast

to an EU average of 0.8% of GDP. The corresponding figures for the other V4 countries are 0.2% in Czechia, 0.3% in Poland, and as much as 0.8% in Hungary.

Unemployment expenditure in Slovakia is around half of the EU average. In 2018 Slovakia's spending on unemployment protection stood at 0.5% of GDP, below the EU average of 0.9% of GDP. The unemployment expenditure-to-GDP ratio was relatively stable between 2013 and 2018, even though the unemployment rate fell sharply during that period. By contrast, the EU average over those five years dropped from 1.3% of GDP to 0.9% of GDP.

Chart 40

Family policy expenditure vis-à-vis the share of the population aged under 16



Source: Eurostat.
Note: The chart does not include Ireland, where a significant share (22%) of the population is aged under 16 and family policy expenditure in 2018 stood at 1.2% of GDP.

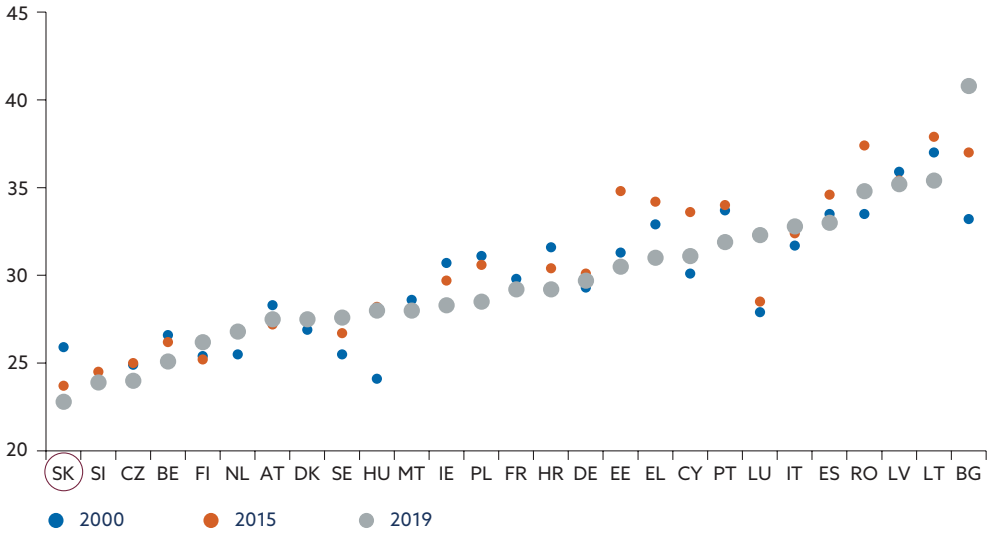
Table 16 Expenditure on social inclusion

Indicator		2010	2013	2014	2015	2016	2017	2018
Social protection expenditure	SK	18.1	18.2	18.4	18.0	18.4	18.2	18.0
(percentage of GDP)	EU average	24.0	24.0	23.7	23.3	23.1	22.7	22.5
Old-age expenditure	SK	6.6	7.0	7.3	7.2	7.2	7.2	7.1
(percentage of GDP)	EU average	9.2	9.6	9.6	9.6	9.4	9.3	9.2
Disability expenditure	SK	1.5	1.6	1.6	1.6	1.6	1.6	1.5
(percentage of GDP)	EU average	2.0	1.9	1.9	1.8	1.8	1.7	1.7
Family policy expenditure	SK	1.7	1.7	1.7	1.6	1.6	1.6	1.5
(percentage of GDP)	EU average	2.1	1.9	1.9	1.9	1.9	1.9	1.9
Unemployment expenditure	SK	1.0	0.6	0.5	0.5	0.5	0.5	0.5
(percentage of GDP)	EU average	1.4	1.3	1.2	1.1	1.1	1.0	0.9
Score		**2010**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Social protection expenditure		-1.13	-0.94	-0.84	-0.83	-0.76	-0.72	-0.74
Old-age expenditure		-1.25	-1.05	-0.91	-0.87	-0.84	-0.79	-0.81
Disability expenditure		-0.53	-0.35	-0.33	-0.26	-0.21	-0.16	-0.24
Family policy expenditure		-0.51	-0.29	-0.27	-0.40	-0.42	-0.45	-0.60
Unemployment expenditure		-0.46	-0.80	-0.83	-0.81	-0.83	-0.79	-0.77

Source: Eurostat.

Income inequality in Slovakia is low relative to the EU average. The income inequality rate (measured on the basis of income distribution using the Gini coefficient) shows Slovakia as the EU country with the lowest income inequality.

Chart 41
Gini coefficient in EU countries



Source: Eurostat.

The ratio of the incomes of the highest-earning households compared to the poorest households shows Slovakia to be a relatively egalitarian country.[22] Income inequality has even fallen since 2010, while in the EU it has remained flat. The improvement is largely due to the narrowing of the gap between higher-earning households (at the 80th percentile) and average-earning households (at the 50th percentile).

Income inequality between genders remains pronounced. In 2019 men's income was 18.1% higher than women's income. Between 2010 and 2019 the gap narrowed by around 1.5 percentage points, while the EU average improved by 2.0 percentage points. The gender pay gap is higher for younger age groups (25–44 years) and lower for older age groups.

[22] The 80/20 percentile ratio can be interpreted as follows: if we ranked people in Slovakia by their level of income, the person ranking higher than 80% of the others would have an income approximately 3.3 times higher than the person ranking lower than 80% of the others (and higher than 20% of the others). This ratio is far lower than the EU average of 4.8.

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Table 17 Income inequality

Indicator		2010	2014	2015	2016	2017	2018	2019
Gini coefficient	SK	25.9	26.1	23.7	24.3	23.2	20.9	22.8
	EU average	29.6	30.4	30.3	30.1	29.9	29.7	29.7
Income quintile share ratio (S80/S20)	SK	3.8	3.9	3.5	3.6	3.5	3.0	3.3
	EU average	4.8	5.0	5.1	5.0	4.9	4.9	4.8
Income quintile share ratio (S80/S50)	SK	2.0	2.0	1.8	-	1.7	1.6	1.7
	EU average	2.2	2.2	2.2	2.1	2.2	2.2	2.2
Income quintile share ratio (S50/S20)	SK	2.0	2.0	2.0	-	2.0	1.9	2.0
	EU average	2.2	2.3	2.3	2.1	2.2	2.2	2.2
Score		**2010**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Gini coefficient		1.00	1.13	1.56	1.52	1.65	2.07	1.69
Income quintile share ratio (S80/S20)		0.91	0.93	1.10	1.08	1.14	1.46	1.22
Income quintile share ratio (S80/S50)		0.91	1.04	1.71	-	1.74	2.00	1.72
Income quintile share ratio (S50/S20)		0.79	0.68	0.62	-	0.59	1.04	0.74

Source: Eurostat.

Table 18 Gender pay gap

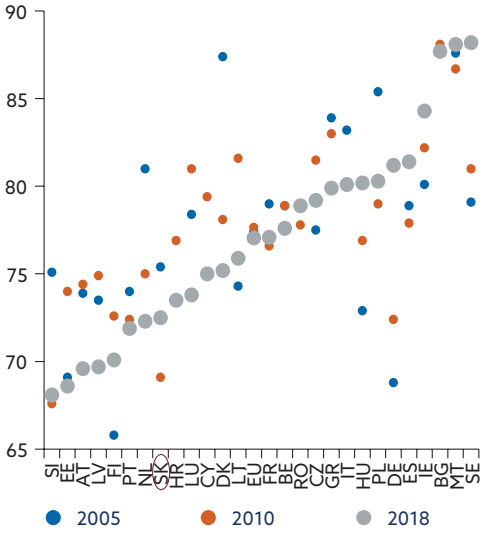
Indicator		2010	2014	2015	2016	2017	2018	2019
Gender pay gap – population	SK	19.6	19.8	19.8	19.0	19.9	19.7	18.1
(percentage)	EU average	14.6	14.2	14.7	14.4	13.7	12.5	12.6
Gender pay gap – 25–34 age group	SK	16.2	13.2	14.5	13.4	15.7	15.9	14.1
(percentage)	EU average	7.2	7.3	8.4	8.5	8.9	8.9	9.7
Gender pay gap – 35–44 age group	SK	27.5	25.8	24.6	24.2	24.4	24.0	22.3
(percentage)	EU average	15.5	14.6	14.9	14.5	14.3	13.9	13.7
Gender pay gap – 45–54 age group	SK	21.5	22.1	22.2	22.0	22.5	22.1	20.6
(percentage)	EU average	16.6	16.6	16.3	15.8	15.7	15.1	14.4
Gender pay gap – 55–64 age group	SK	13.5	18.3	17.6	16.8	17.1	17.3	16.3
(percentage)	EU average	15.4	15.8	14.7	13.5	13.4	13.8	11.9
Gender pay gap – over-65 age group	SK	6.7	17.7	20.5	20.6	24.4	14.9	11.7
(percentage)	EU average	18.5	21.6	19.8	17.8	16.4	16.2	12.5
Gender pay gap – under-25 age group	SK	7.3	11.5	12.3	11.1	12.8	12.3	10.4
(percentage)	EU average	2.7	5.2	6.2	6.2	6.6	5.7	6.6
Score		**2010**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Gender pay gap – population		-0.84	-1.02	-1.03	-0.97	-1.12	-1.38	-0.99
Gender pay gap – 25–34 age group		-1.57	-1.09	-1.19	-1.01	-1.40	-1.16	-0.97
Gender pay gap – 35–44 age group		-1.76	-1.67	-1.53	-1.60	-1.65	-1.44	-1.43
Gender pay gap – 45–54 age group		-0.69	-0.85	-0.95	-1.03	-1.14	-1.06	-1.04
Gender pay gap – 55–64 age group		0.19	-0.32	-0.40	-0.45	-0.54	-0.47	-0.65
Gender pay gap – over 65 age group		0.83	0.29	-0.05	-0.19	-0.49	0.10	0.06
Gender pay gap – under-25 age group		-0.88	-1.29	-1.30	-1.08	-1.43	-1.30	-1.08

Source: Eurostat.

7 Health

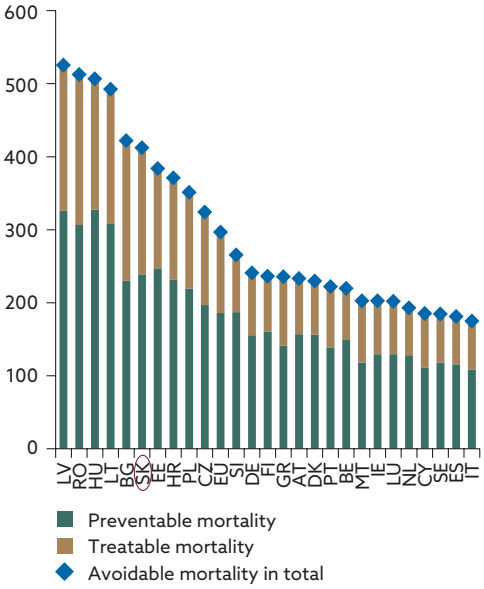
On all health outcome indicators, Slovakia is lagging far behind the EU average. In 2019 life expectancy at birth was 2.7 years lower in Slovakia than in the EU on average. Although Slovakia has seen a gradual improvement in this indicator, it has not managed to close the gap. **The problem is not only that the average lifespan is shorter relative to other countries, but that the average healthy lifespan is also shorter** (Chart 42).

Chart 42
Healthy life years at birth as a share of total life expectancy (percentages)



Source: Eurostat.

Chart 43
Avoidable mortality in 2017 (deaths per 100,000 inhabitants)



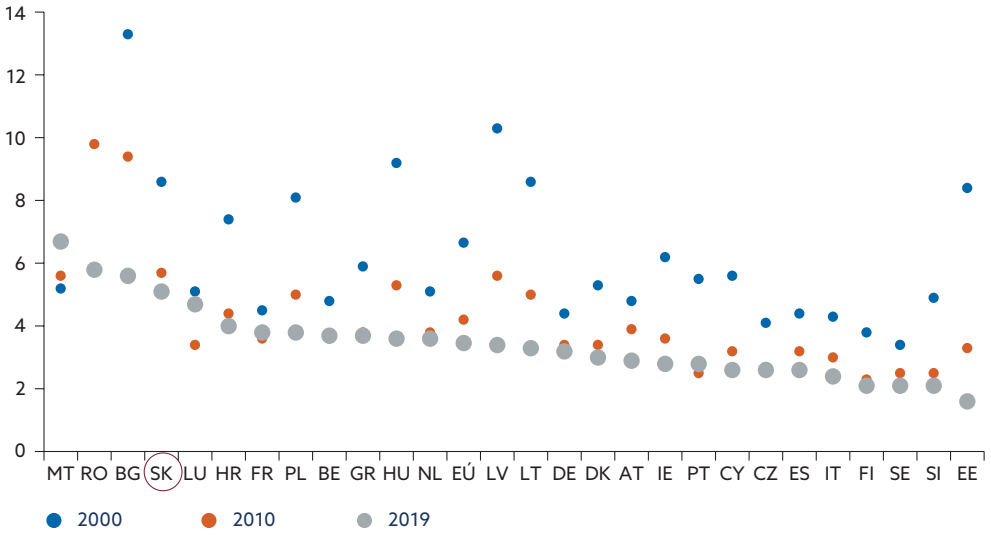
Source: Eurostat.

Poor health outcomes in Slovakia can be attributed to shortcomings in prevention and health care. Like other central and eastern European countries, Slovakia reports a far higher avoidable mortality rate relative to western Europe (Chart 43). In 2017 there were 412 avoidable deaths per 100,000 inhabitants in Slovakia, including 239 deaths from preventable causes and 174 from treatable causes. Among EU countries, both of those figures are above average.

As for infant mortality, Slovakia has made progress on this metric but still lags behind western Europe and the other V4 countries. Infant mortality in Slovakia fell from 8.6 deaths per 1,000 live births in 2000, to 5.1 in 2019. Even so, Slovakia has the fourth highest infant mortality rate in the EU and by far the highest among the V4 countries. In this regard, the country is characterised by regional disparity. Whereas western Slovakia has an infant mortality rate close to the EU average, eastern Slovakia – where

marginalised communities are more prevalent – has a much higher rate that significantly increases the overall average. Besides infant mortality, another problem for Slovakia is the relatively high share of newborns with low birth weight.

Chart 44
Infant mortality



Source: Eurostat.

Table 19 Health outcome indicators

Indicator		2010	2015	2016	2017	2018	2019
Life expectancy at birth	SK	75.6	76.7	77.3	77.3	77.4	77.8
(years) *Source: Eurostat*	EU average	78.7	79.7	80.0	80.0	80.2	80.5
Preventable mortality	SK		258	244	239		
(deaths per 100,000 inhabitants) *Source: Eurostat*	EU average		192	188	186		
Treatable mortality	SK		177	168	174		
(deaths per 100,000 inhabitants) *Source: Eurostat*	EU average		114	111	111		
Infant mortality	SK	5.7	5.1	5.4	4.5	5.0	5.1
(deaths per 1,000 live births) *Source: Eurostat*	EU average	4.2	3.6	3.7	3.5	3.4	3.5
Newborns with low birth weight	SK	9.0	7.7	7.5	7.5	7.3	7.5
(percentage) *Source: OECD*	OECD average	6.5	6.6	6.5	6.5	6.4	

Score	2010	2015	2016	2017	2018	2019
Life expectancy at birth	-1.02	-1.05	-0.95	-0.98	-0.99	-0.97
Preventable mortality		-0.87	-0.77	-0.74		
Treatable mortality		-1.21	-1.14	-1.28		
Infant mortality	-0.81	-1.08	-1.21	-0.76	-1.34	-1.33
Newborns with low birth weight	-1.45	-0.67	-0.66	-0.66	-0.56	

The global pandemic has shown the importance of having robust policies in areas of public health and the health system and of interconnecting them with the economy. The spread of the COVID-19 disease from the end of 2019 caught most countries unprepared – the rapid spread of the pandemic resulted in huge pressure on health systems and in high excess mortality rates. The pandemic also had profound economic repercussions (Box 4).

Box 4
Linking the pandemic's economic and health impacts

In response to the rapid spread of the coronavirus pandemic, national governments enforced social distancing restrictions, which had a direct downward impact on economic activity. On the supply side, the restrictions imposed on people's movements and on business activities resulted in the immediate shutdown of much of the services sector. Likewise, quarantine requirements and the closure of schools and pre-school facilities depleted the workforce and therefore had an adverse impact on firms' production. Supply-side restrictions in spring 2020, during the pandemic's first wave, even led to the paralysis of global supply chains. The negative supply-side developments were further accentuated by a decline in demand, stemming from the climate of uncertainty and from falling household income.

The depth of the economic downturn was a corollary of the extent of the failure to contain the pandemic. Chart A illustrates the situation in European Economic Area (EEA) countries and Switzerland: the countries reporting higher average excess mortality between March and December 2020 were, on average, those that experienced a greater economic downturn. An IMF analysis[23] of the first seven months of the pandemic further pointed to the nature of the link between the spread of infections and the pandemic's economic fallout. Although measures to contain the spread of infections caused a short-term economic contraction, an unchecked spread could have resulted in even greater economic losses. The most successful strategy, according to the IMF, was to rapidly adopt tight lockdowns that allowed, on the one hand, the pandemic situation to be brought under control within a relatively short time and, on the other hand, a strong recovery to take place once containment measures were eased. By contrast, where measures were eased prematurely, before the spread of infections was contained, the rates of economic recovery tended to be lower.[24]

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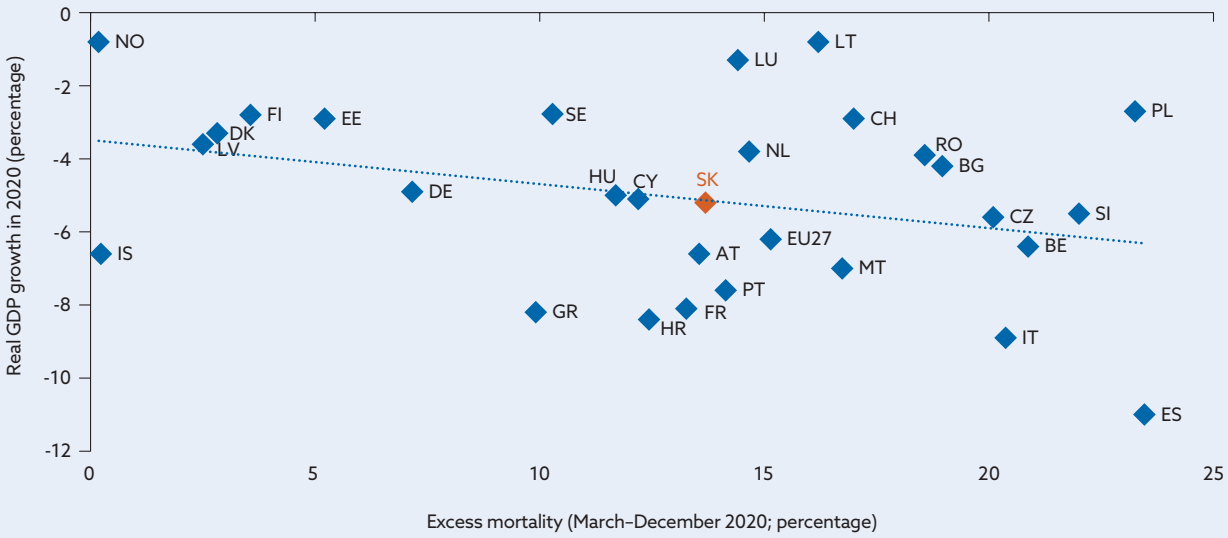
[23] "The Great Lockdown: Dissecting the Economic Effects", *World Economic Outlook*, International Monetary Fund, October 2020.

[24] One of the reasons for this phenomenon is that regardless of the stringency of a country's containment measures, a pandemic-related voluntary change in social mobility within that country can be observed.

Chart A

Economic growth and excess mortality in EEA countries and Switzerland



Sources: Eurostat, and NBS calculations.

Slovakia's health system is less well funded compared with other EU countries; however, it has a temporary advantage in that the country's population still has a relatively young age structure. In Slovakia, healthcare expenditure[25] in 2018 amounted to 6.7% of GDP, which was 1.5 below the EU average. However, the relatively low share of the population aged over 60 may in fact reduce demand for health care. Adjusting for this effect,[26] health expenditure is roughly at the level of the EU average (Chart 46).

Increasing the efficiency of health expenditure has the potential to improve health outcomes. The issue of inefficiency in health expenditure was pointed out by the Ministry of Finance's Value for Money Division in the second health spending review of October 2019.[27] The main problems in this regard are high expenditure on medicines, diagnostics, and excessive numbers of special-

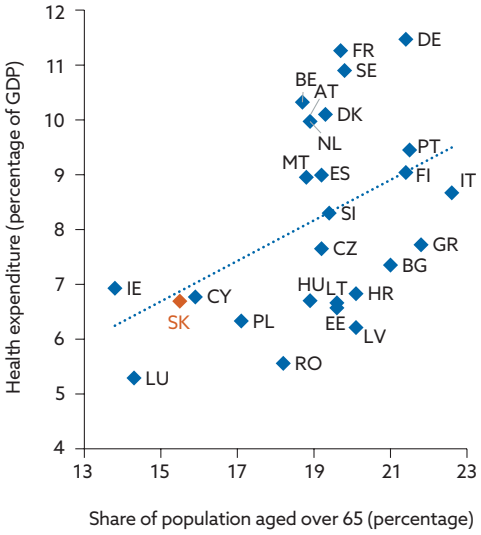
[25] This refers to total current expenditure on health care; in other words it is not confined to public health insurance expenditure but also includes households' out-of-pocket expenditure on health care, i.e. all funds (except for capital investment) available to the health system for the provision of health care.

[26] Expenditure was adjusted for the impact of population ageing by restandardising it according to the relative share of the population aged over 60. This computed ratio is strongly correlated with the residual from the linear regression of health expenditure on the share of population aged over 60.

[27] *Revízia výdavkov na zdravotníctvo II – Záverečná správa (Health Spending Review II – Final Report),* Ministry of Finance of the Slovak Republic and Ministry of Health of the Slovak Republic, October 2017.

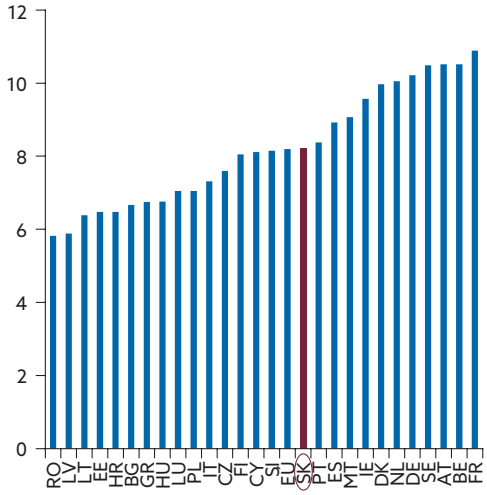
ist consultations. The spending review found scope for potential savings of €542 million per year. Consistent implementation of efficiency-increasing measures can therefore have the same impact on improving health outcomes as a corresponding level of expenditure; it will also, however, be crucial to addressing the financial pressures that population ageing will bring.

Chart 45
The impact of population ageing on health expenditure (2018)



Sources: Eurostat, and NBS calculations.

Chart 46
Health expenditure adjusted for the impact of population ageing (percentage of GDP; 2018)



Sources: Eurostat, and NBS calculations.

Slovakia's health system is marked by a shortage of doctors and nurses and by shortcomings in the structure of health personnel. The population-to-doctor and population-to-nurse ratios in Slovakia are relatively high by EU standards. In the case of doctors, the gap with the EU average is increasing. According to the second health spending review, another problem is the structure of health personnel and its division of competencies. The most notable shortages are in primary care. This, coupled with the relatively restricted competencies of general practitioners (GPs), means there is excessive recourse to specialist health care. Similarly problematic are nurses' relatively low competencies – the expansion of which is also constrained by the low numbers of nurses. Another challenge for the future is the unfavourable age structure of GPs and nurses.

The bed capacity of Slovak hospitals is higher than the EU average. Hence there may be scope for savings in this area as part of a reconfiguration of the hospital network. Any efforts to modernise the hospital network will, however, need to be informed by experiences from the coronavirus pandemic and ensure that the hospitals are able to respond to a similar situation in the future. These experiences indicate, moreover, that the weak link in the health system is not bed capacity but rather a general shortage of health personnel.

The distribution of CT and MRI scanners in Slovakia is below the EU average. To compensate for this situation, however, the scanners are used more intensively. Although Slovakia ranks poorly for the distribution of modern diagnostic equipment, the number of CT and MRI examinations in the country is only slightly below the OECD average. This is because Slovakia makes relatively better use of its existing capacities. It has also seen an improvement in this area since 2010.

Table 20 Health system resources

Indicator		2010	2014	2015	2016	2017	2018
Healthcare expenditure	SK		6.9	6.8	7.0	6.8	6.7
(percentage of GDP) *Source: Eurostat*	EU average	9.1	8.3	8.2	8.2	8.2	8.2
Healthcare expenditure per capita	SK		1,533	1,605	1,506	1,478	1,539
(EUR at PPP) *Source: Eurostat*	EU average	2,406	2,291	2,405	2,409	2,460	2,552
Inhabitants per hospital bed	SK	155	173	174	173	172	176
Source: Eurostat	EU average	207	220	221	223	228	234
Inhabitants per doctor	SK	298	292	290	288	292	284
Source: Eurostat	EU average	304	283	280	273	269	256
Inhabitants per nurse	SK	165	174	176	174	177	175
Source: Eurostat	EU average	133	130	132	130	128	133
CT examinations	SK	90	135	156	162	154	155
(number per 1,000 inhabitants) *Source: OECD*	OECD average	112	135	137	142	148	158
MRI examinations	SK	34	52	57	61	63	70
(number per 1,000 inhabitants) *Source: OECD*	OECD average	45	61	63	67	69	74
Number of examinations per CT scanner	SK	6,371	7,770	8,734	9,375	8,905	8,451
Source: OECD	OECD average	6,410	6,122	6,587	6,700	6,867	7,135
Number of examinations per MRI scanner	SK	4,875	6,213	6,415	6,808	6,585	7,282
Source: OECD	OECD average	4,709	4,461	4,766	4,735	4,735	5,106

Score	2010	2014	2015	2016	2017	2018
Healthcare expenditure		-0.73	-0.75	-0.68	-0.76	-0.82
Healthcare expenditure per capita		-0.72	-0.74	-0.87	-0.94	-0.96
Inhabitants per hospital bed	0.72	0.56	0.56	0.60	0.64	0.65
Inhabitants per doctor	0.10	-0.17	-0.17	-0.29	-0.46	-0.69
Inhabitants per nurse	-0.63	-0.88	-0.89	-0.92	-1.01	-0.88
CT examinations	-0.42	-0.01	0.39	0.38	0.11	-0.04
MRI examinations	-0.43	-0.29	-0.21	-0.16	-0.20	-0.15
Number of examinations per CT scanner	-0.01	0.48	0.64	0.76	0.57	0.35
Number of examinations per MRI scanner	0.07	0.70	0.72	0.91	0.89	0.97

Outcomes in the area of healthcare quality are mixed. There are shortcomings in the prevention and treatment of cancer and in the vaccination coverage rate for the elderly. On the other hand, the vaccination coverage rate for children seems satisfactory.

Slovakia has poor outcomes in the treatment and prevention of cancer. The five-year survival rates for lung and breast cancer are significantly lower than the OECD average, as are the screening rates for breast cancer and cervical cancer. Since 2010, moreover, these screening rates have declined and the corresponding gaps with the OECD averages have widened.

The vaccination coverage rate for children in Slovakia is relatively high, but the rate for the elderly is below average. The vaccination coverage of children against measles, diphtheria, tetanus, whooping cough (pertussis) and hepatitis B is 95% and therefore above the OECD average. The coverage rate has, though, been falling in recent years. The situation is different with the influenza vaccination coverage rate for people aged over 65, which is far below average. This shortcoming may result in avoidable deaths in this age group and in an additional burden on the health system.

As regards the quality of acute care for heart attacks and strokes, Slovakia's health system has mixed outcomes. For heart attack patients in Slovakia, the 30-day mortality rate is slightly better than the OECD average, while for stroke patients it is slightly worse. Overall, though, the quality of acute care shows an improving trend.

Only a small share of the population has problematic access to essential health care. The share of the population aged over 16 reporting an unmet need for medical care was 2.7% in 2019. Although the number of people with an unmet need for medical care has increased since 2021, it remains relatively similar to the OECD average.

Environmental, lifestyle and various social factors also have a considerable impact on a population's health. Bad air pollution, for example, translates into a high level of premature deaths. In Slovakia, the premature death rate due to air pollution – i.e. exposure to fine particulate matter (PM2.5) – is 637 per million inhabitants, more than twice as high as the OECD average. A joint study by the World Bank and the Slovak Environment Ministry's Institute for Environmental Policy[28] estimates that reducing the concentration of particulate matter[29] in the ambient air in Slovakia to the levels recommended by the World Health Organization would result in 1,600 fewer premature deaths per year. The same study puts the costs of air-pollution-related excess mortality and morbidity at 6.9% of GDP per year.

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[28] *Príčiny a zdravotné dôsledky znečistenia ovzdušia na Slovensku (Causes and health effects of air pollution in Slovakia)*, World Bank, Institute for Environmental Policy of the Ministry of Environment of the Slovak Republic, February 2021.

[29] The estimate includes, in addition to PM2.5 particular matter, PM10 particulate matter and nitrogen dioxide (NO2).

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Table 21 Selected healthcare quality indicators								
Indicator		2010	2014	2015	2016	2017	2018	2019
Self-reported unmet need for medical care	SK	1.7	2.1	2.1	2.3	2.4	2.6	2.7
(percentage of population aged over 16) Source: Eurostat	EU average	3.6	3.9	3.5	3.2	2.5	2.7	2.5
AMI 30-day mortality	SK	8.0	6.2	6.3	5.8	5.9		
(deaths per 100 admissions) Source: OECD	OECD average	8.0	7.3	7.4	7.3	7.6		
Ischaemic stroke 30-day mortality	SK	11.5	9.6	9.4	8.8	9.6		
(deaths per 100 admissions) Source: OECD	OECD average	9.4	8.5	9.0	8.7	8.6		
Haemorrhagic 30-day mortality	SK	30.8	28.2	28.8	25.5	26.9		
(deaths per 100 admissions) Source: OECD	OECD average	25.2	23.7	24.1	24.7	24.0		
Breast cancer five-year net survival [1)]	SK	76.6	75.5					
(percentage) Source: OECD	OECD average	83.2	84.2					
Lung cancer five-year net survival [1)]	SK	10.5	11.2					
(percentage) Source: OECD	OECD average	15.0	17.0					
Immunisation of children against measles	SK	98.0	97.0	95.0	95.0	96.0	96.0	
(percentage) Source: OECD	OECD average	93.8	94.8	94.9	94.6	94.4	94.8	
Immunisation of children against diphtheria, tetanus and pertussis	SK	99.1	96.8	96.0	96.4	96.4	96.5	
(percentage) Source: OECD	OECD average	95.1	95.1	95.2	95.0	94.9	94.8	
Immunisation of children against hepatitis B	SK	99.0	97.0	96.0	96.0	96.0	97.0	
(percentage) Source: OECD	OECD average	88.6	90.6	91.4	92.2	90.4	90.8	
Immunisation of people aged over 65 against influenza	SK	23.8	14.1	13.8	13.3	13.0	12.5	
(percentage) Source: OECD	OECD average	44.1	43.2	43.4	42.8	44.7	46.7	
Breast cancer screening rate	SK	32.7	30.1	30.4	30.8	30.7	30.4	
(percentage of women aged 50–69) Source: OECD	OECD average	58.8	59.4	57.2	58.3	58.2	60.3	
Cervical cancer screening rate	SK	48.5	46.9	48.3	46.0	46.2	45.6	
(percentage of women aged 20–69) Source: OECD	OECD average	56.8	59.7	59.6	59.1	59.6	60.2	

Table 21 Selected healthcare quality indicators (continued)

Score	2010	2014	2015	2016	2017	2018	2019
Self-reported unmet need for medical care	0.50	0.50	0.37	0.23	0.03	0.03	-0.07
AMI 30-day mortality	0.00	0.26	0.25	0.28	0.36		
Ischaemic stroke 30-day mortality	-0.64	-0.30	-0.12	-0.03	-0.20		
Haemorrhagic 30-day mortality	-0.96	-0.73	-0.80	-0.12	-0.48		
Breast cancer five-year net survival [1)]	-1.30	-1.69					
Lung cancer five-year net survival [1)]	-1.03	-1.09					
Immunisation of children against measles	1.04	0.71	0.03	0.14	0.42	0.40	
Immunisation of children against diphtheria, tetanus and pertussis	1.12	0.57	0.30	0.44	0.47	0.53	
Immunisation of children against hepatitis B	0.61	0.52	0.49	0.53	0.57	0.66	
Immunisation of people aged over 65 against influenza	-0.89	-1.19	-1.35	-1.33	-1.51	-1.60	
Breast cancer screening rate	-1.38	-1.83	-1.60	-1.64	-1.92	-1.82	
Cervical cancer screening rate	-0.49	-0.88	-0.76	-0.93	-1.02	-1.00	

Note: 1) The figure for 2014 represents the period 2010–2014, while the figure for 2010 represents the period 2005–2009.

As for negative lifestyle factors in Slovakia, the main problem appears to be relatively high alcohol consumption. Pure alcohol consumption per capita in Slovakia stands at 1.2 litres per year, which is higher than the OECD average. The smoking rate in Slovakia is only slightly higher than the EU average, though its rate of decline since 2008 has been less pronounced. Obesity, as measured by the body mass index (BMI), is less prevalent in Slovakia than in the EU on average.

Health outcomes in Slovakia are also adversely affected by social exclusion, mainly among marginalised Roma communities. Problematic access to health care and social exclusion can be detrimental to health outcomes. The share of out-of-pocket healthcare expenditure in Slovakia's total healthcare expenditure is 18.9%, below the EU average. Therefore, in general, the way health care is funded is not expected be a significant constraint on access to health care. However, the Institute for Financial Policy[30] points to the low rate of healthcare use among marginalised communities. Besides financial barriers, the causes of this situation include mainly low awareness, discrimination, and cultural and linguistic barriers. Because of their low access to health care and poor living conditions, these marginalised communities score far worse than the majority population on health status, life expectancy at birth, and infant mortality.

[30] "Inklúzia Rómov je potrebná aj v zdravotníctve" (Roma inclusion is also necessary in health care), *Komentár (Commentary)*, No 2018/23, Institute for Financial Policy, Ministry of Finance of the Slovak Republic, December 2018.

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Table 22 Indictors of lifestyle and other factors

Indicator		2010	2015	2016	2017	2018	2019	2020
Premature deaths due to ambient air pollution	SK	751	646	613	614	622	636	
(deaths per million inhabitants) *Source: OECD*	OECD average	357	301	286	280	285	290	
Share of out-of-pocket payments	SK		18.4	18.2	18.7	18.9		
(percentage) *Source: Eurostat*	EU average	21.0	22.3	22.3	22.3	21.7		
Smoking prevalence [1)]	SK	26.0			26.0			25.0
(percentage) *Source: Eurostat*	EU average	29.6			26.0			24.6
Obesity rate by body mass index (BMI) [2)]	SK	15.1			14.4			
(percentage) *Source: Eurostat*	EU average	15.8			16.8			
Alcohol consumption	SK	10.1	10.2	9.9	9.7	10.1		
(litres per inhabitant aged over 15) *Source: OECD*	OECD average	9.1	8.9	8.8	9.0	8.9		

Score	2010	2015	2016	2017	2018	2019	2020
Premature deaths due to ambient air pollution	-1.67	-1.69	-1.68	-1.74	-1.73	-1.76	
Share of out-of-pocket payments		0.37	0.38	0.34	0.27		
Smoking prevalence [1)]	0.62			0.01			-0.05
Obesity rate by body mass index [2)]	0.19			0.70			
Alcohol consumption	-0.37	-0.48	-0.40	-0.28	-0.46		

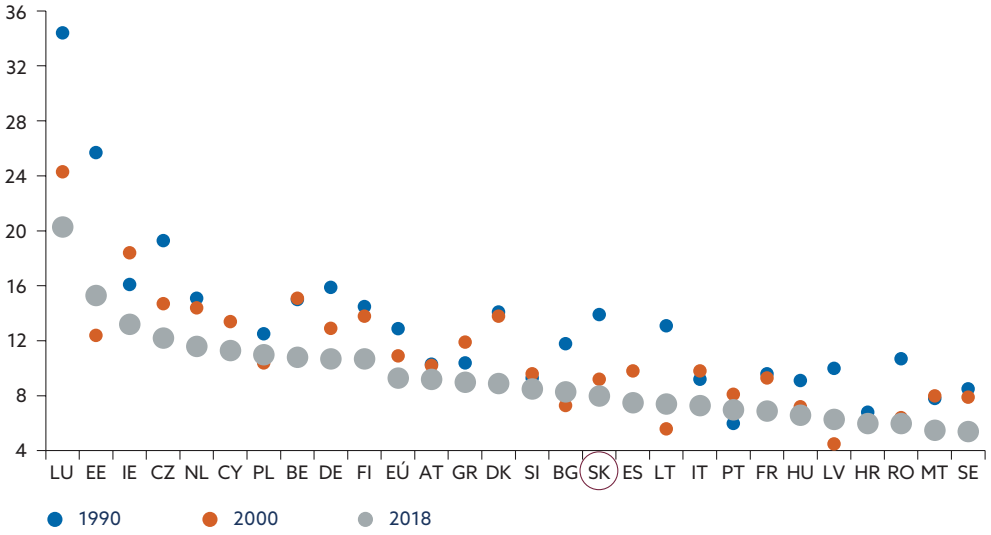
Note: 1) The figure under 2010 is for 2009. 2) The figure under 2010 is for 2008.

8 Environment

Despite having a relatively low carbon footprint, Slovakia is faced with the challenge of how to reconcile economic convergence with the mid-century objective of a climate-neutral economy. Other environmental challenges include air pollution, mounting waste generation, and how to increase the recycling rate. GDP growth per capita will have to be offset by increasing the economy's energy productivity and reducing the emissions intensity of energy consumption. This transformation will be a high-cost process. At the same time, these costs can be seen as an investment that will avert much greater costs related to climate change and will have a generally positive impact on the environment in Slovakia. This issue is examined more closely in Box 5.

Slovakia is among the EU countries that report a below-average level of greenhouse gas (GHG) emissions per capita. Furthermore, its level of GHG emissions has fallen significantly since 1990. Slovakia's relatively low economic level among EU countries is reflected in its lower GHG emissions per capita. Compared with 1990, moreover, these emissions have declined by more than 40 %, owing mainly to the economic transformation that the country underwent after 1989; its progress in this area since 2000 has been only slight (Chart 47).

Chart 47
GHG emissions per capita (tonnes of CO2 equivalent)



Source: Eurostat.

Additional indicators show scope for further reduction in energy and emissions intensity. In terms of energy productivity, the Slovak economy lags far behind the EU average, and this gap has been growing over time. The country's progress since 2000 in reducing the emissions intensity of

energy consumption is similar to the EU average, although its pace in recent years has been somewhat slower. As for the share of renewable energy in its energy mix, Slovakia is also below the EU average and has a high share of solid fossil fuels in its energy consumption. Slovakia also fares poorly in regard to new passenger car emissions (high) and material consumption efficiency (low). On a positive note, the growth rate of final energy consumption has decreased since 2000, although it has been accelerating in recent years. Other favourable indicators are the share of public transport in total passenger transport and the share of rail in total freight transport, both of which are relatively high.

Table 23 Climate neutrality indicators

Category	Indicator		2010	2014	2015	2016	2017	2018	2019
Outcome indicators	Change in greenhouse gas emissions	SK	63.3	55.6	57.0	57.7	59.3	59.2	
	(index: 1990 = 100)	EU average	90.9	81.2	81.1	81.4	83.1	82.1	
	Greenhouse gas emissions per inhabitant	SK	8.6	7.6	7.7	7.8	8.0	8.0	
	(tonnes per inhabitant)	EU average	10.5	9.3	9.2	9.3	9.4	9.3	
Additional indicators	Energy productivity	SK	5.8	7.1	7.2	6.8	6.5	6.8	7.0
	(PPS per kilogram of oil equivalent)	EU average	6.5	7.7	8.0	8.1	8.3	8.6	9.1
	GHG emissions intensity of energy consumption	SK	90.4	84.7	84.6	84.9	83.2	83.6	
	(index: 2000 = 100)	EU average	94.9	88.9	88.2	86.9	85.7	84.0	
	Final energy consumption	SK	105.2	90.8	91.8	94.8	101.5	101.4	101.8
	(index: 2000 = 100)	EU average	109.3	101.0	103.3	105.7	108.4	109.7	109.6
	Share of renewable energy in the energy mix	SK	9.1	11.7	12.9	12.0	11.5	11.9	16.9
	(percentage)	EU average	16.4	19.8	20.4	20.5	20.9	21.5	22.4
	Share of solid fossil fuels in final energy consumption	SK	6.9	5.1	4.9	4.0	4.1	4.3	4.2
	(percentage)	EU average	2.7	2.4	2.3	2.1	2.1	2.1	1.9
	Average CO2 emissions per km from new passenger cars	SK	149.0	131.7	127.6	124.8	126.1	127.7	
	(grams of CO2 per kilometre)	EU average	144.1	124.7	120.9	118.7	119.1	120.3	
	Material consumption efficiency	SK	1.4	1.7	1.7	1.7	1.7	1.6	1.8
	(PPS per kilogram)	EU average	1.6	1.8	1.8	1.9	1.9	2.0	2.0
	Share of buses and trains in total passenger transport	SK	22.0	22.6	24.2	25.2	25.6	26.1	
	(percentage)	EU average	18.3	18.4	18.3	18.2	17.9	17.9	
	Share of rail in total freight transport	SK	38.5	38.9	36.6	34.6	32.9	32.6	
	(percentage)	EU average	25.9	25.1	24.5	23.7	23.8	24.1	

Table 23 Climate neutrality indicators (continued)

Category	Score	2010	2014	2015	2016	2017	2018	2019
Outcome indicators	Change in greenhouse gas emissions	0.99	1.05	0.99	0.95	0.91	0.89	
	Greenhouse gas emissions per inhabitant	0.45	0.49	0.46	0.44	0.42	0.39	
Additional indicators	Energy productivity	-0.42	-0.30	-0.37	-0.53	-0.66	-0.64	-0.71
	GHG emissions intensity of energy consumption	0.47	0.45	0.38	0.20	0.24	0.05	
	Final energy consumption	0.45	0.86	1.01	0.90	0.49	0.52	0.46
	Share of renewable energy in the energy mix	-0.67	-0.69	-0.63	-0.71	-0.79	-0.81	-0.45
	Share of solid fossil fuels in final energy consumption	-1.06	-0.75	-0.77	-0.57	-0.61	-0.72	-0.89
	Average CO2 emissions per km from new passenger cars	-0.47	-0.70	-0.68	-0.75	-0.89	-0.89	
	Material consumption efficiency	-0.23	-0.16	-0.13	-0.27	-0.31	-0.34	-0.29
	Share of buses and trains in total passenger transport	0.77	0.93	1.33	1.62	1.73	1.86	
	Share of rail in total freight transport	0.57	0.69	0.63	0.60	0.50	0.46	

Source: Eurostat.

Box 5
Reconciling climate neutrality with economic growth

To achieve climate neutrality by 2050 and the related targets set for 2030[31] while also catching up with the economic level of western Europe will require the decoupling of economic growth from the production of GHG emissions. The Kaya identity[32] is a decomposition that expresses GHG emissions according to their contributing factors, as follows:

$$Emissions = Population \times \frac{GDP}{Population} \times \frac{Energy}{GDP} \times \frac{Emissions}{Energy},$$

where Energy/GDP and Emissions/Energy represent, respectively, the energy intensity of the economy and the emissions intensity of energy consumption.

It follows from this decomposition that the increase in GHG emissions associated with growth in GDP per capita or in the population per se can be reversed by reducing the economy's energy and emissions intensity. A reduction in energy intensity can be supported by policies aimed at increasing energy efficiency and by changing the structure of the economy in such a way that promotes less energy-intensive industries. Emissions intensity can be lowered

[31] The EU's original objective was a 40% reduction in GHG emissions by 2030 compared to 1990. This goal, however, was not in line with its commitments under the Paris Agreement. Therefore, in December 2020, the Council of the EU decided to increase its emissions reduction target to at least 55% by 2030. Going forward, this target will be incorporated in EU legislation and policies as well as in national-level targets and measures.

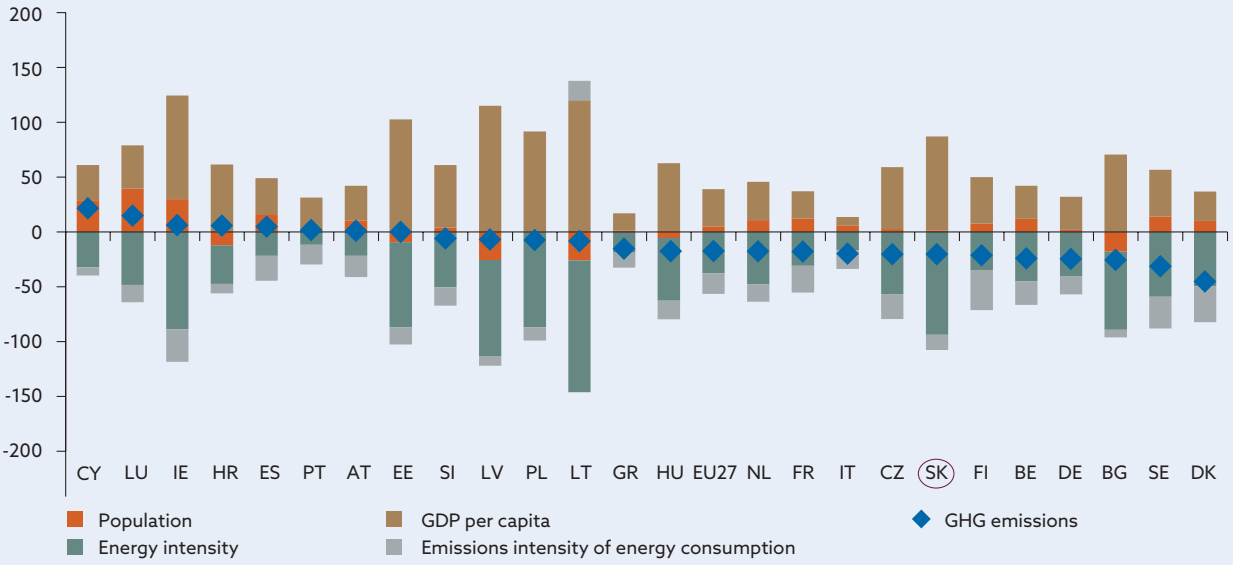
[32] Kaya, Y., "Impact of carbon dioxide emission control on GNP growth: Interpretation of proposed scenarios", IPCC Energy and Industry Subgroup, Response Strategies Working Group, Paris, 1990.

by, for example, increasing the share of renewable energy in the energy mix (i.e. reducing the emissions intensity of electricity generation) or using carbon capture and storage technology.

In Slovakia, the process of decoupling economic growth from the production of emissions is going well for now. The challenge, however, will be to keep reducing emissions after the less costly reduction measures have been exhausted. Despite experiencing strong economic growth between 1995 and 2018, Slovakia is among the EU countries that managed the largest reductions in GHG emissions during that period (Chart A). The reduction in Slovakia was driven mainly by the economy's decreasing energy intensity and, to a lesser extent, by the decreasing emissions intensity of energy consumption. However, the relatively inexpensive measures taken towards this end (switching from coal to gas, restructuring the economy to promote more efficient firms, introducing market principles, etc.) have now largely been exhausted, according to the Low-Carbon Development Strategy of the Slovak Republic with a View to 2050. According to modelling performed in cooperation with the World Bank, the necessary decarbonisation measures outside the current framework will cost on average 4.2% of GDP per year between 2020 and 2050.[33] However, the view expressed in the Strategy is that these costs should be seen as investments aimed at preventing the adverse effects of climate change and also as investments generating positive externalities in the form of a better quality environment and new green sectors in the economy.

Chart A

Decomposition of the change in GHG emissions between 1995 and 2018

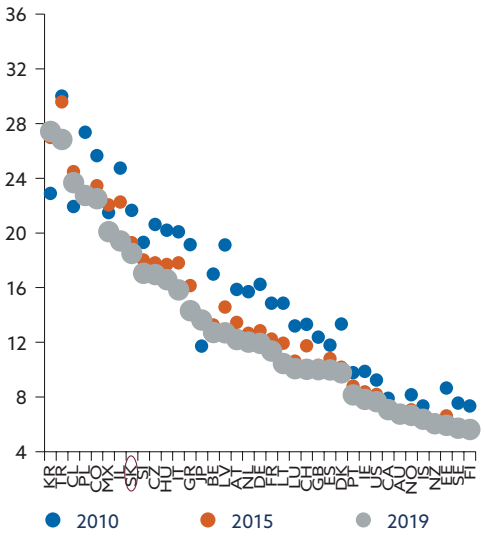


Sources: Eurostat, and NBS calculations.
Note: The change is logarithmic, not a percentage.

[33] Even the scenario 'with additional measures' is not, however, sufficient to meet the objective of climate neutrality in 2050, since the formal adoption of that objective post-dated the modelling. The additional costs may therefore be even higher, and the Strategy's update will address the estimation of those costs.

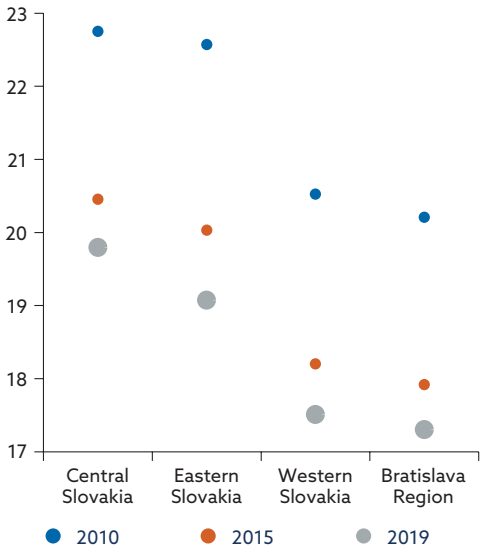
Slovakia has seen an improvement in its air quality but remains a country with high air pollution, which is reflected in its excess mortality. Despite recording a decline in mean population exposure to fine particulate matter (PM2.5) between 2010 and 2019, Slovakia has relatively high air pollution compared with the OECD average. This situation is also reflected in its excess mortality caused by air pollution (see Chapter 7). Moreover, exposure to pollution is regionally differentiated – central and eastern Slovakia have relatively higher levels of pollution. Regional differentiation at the district level for a wider range of pollutants is also identified in a joint study by the World Bank and the Slovak Environment Ministry's Institute for Environmental Policy.[34] According to the study, the implementation by 2030 of measures[35] under the National Air Pollution Control Programme would result in reduced mortality and morbidity, and the present value of that benefit is estimated at €2.4 billion, against a cost of between €398 million and €1.12 billion.

Chart 48
Mean population exposure to PM2.5 (micrograms per cubic metre)



Source: OECD.

Chart 49
Mean population exposure to PM2.5 in Slovak regions (micrograms per cubic metre)



Source: OECD.

Other factors that lead to a more polluted environment in Slovakia are the lower proportion of the population connected to waste water treatment systems and the high share of industry in the Slovak economy. Certain

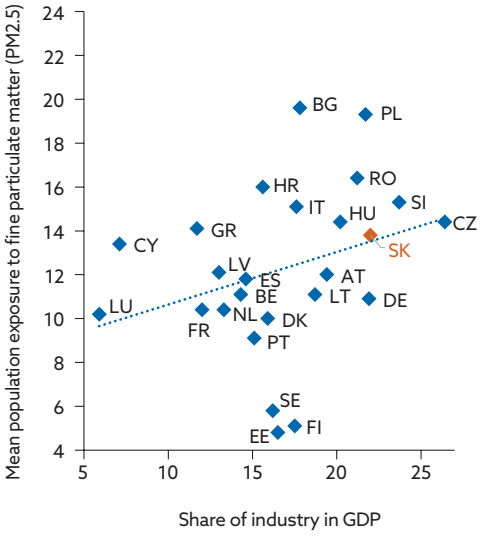
[34] *Príčiny a zdravotné dôsledky znečistenia ovzdušia na Slovensku (Causes and health effects of air pollution in Slovakia)*, World Bank, Institute for Environmental Policy of the Ministry of Environment of the Slovak Republic, February 2021.

[35] These include emission-reducing measures in the areas of transportation, household heating, and agricultural storage and use of manure, and the unification of tax rates for petrol and diesel.

additional indicators imply a greater environmental burden. In 2018 the share of Slovakia's population connected to waste water treatment systems stood at 65.7%, while the EU average was 71.9%. Phosphate pollution of rivers also seems to be at an adverse level. The high share of industry in the economy may be detrimental, too, though the level of fine particulate (PM2.5) air pollution is consistent with the structure of the economy (Chart 50). By contrast, nitrate contamination of groundwater appears to be lower in Slovakia than in most other EU countries.

Chart 50

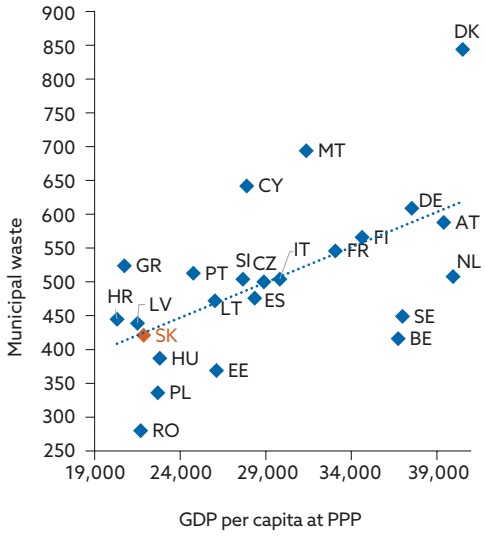
Air pollution vis-à-vis the share of industry in GDP (2019; micrograms per cubic metre; percentages)



Sources: Eurostat, and NBS calculations.
Note: An outlier value for Ireland was excluded.

Chart 51

Municipal waste generation vis-à-vis the economic level (2019; kilograms per capita; GDP in purchasing power standard)



Sources: Eurostat, and NBS calculations.
Note: An outlier value for Lithuania was excluded.

Slovak households produce a relatively low amount of municipal waste compared with the EU average, but the recycling rate for that waste remains slightly below par. Like other countries at a similar economic level, Slovakia generates a relatively small amount of municipal waste per capita (Chart 51). Recent years, however, have seen a narrowing of the gaps in waste generation, albeit due in part to improved reporting of metallic waste.[36] The recycling rate for municipal waste in Slovakia was 38.5% 2019, slightly below the EU average.[37] The increase in municipal waste recycling in recent years is also partly explained by methodological factors. As for waste management in Slovakia, the high landfill rate of waste is problematic, as is the low recovery rate of packaging waste.

[36] See, for example, the information provided here by the Institute for Environmental Policy.
[37] For comparison, Germany is the leading EU country in terms of recycling municipal waste, with a rate of 66.7%.

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Table 24 Pollution indicators

Category	Indicator		2010	2014	2015	2016	2017	2018	2019	2020
Outcome indicator	Mean population exposure to PM2.5	SK	21.7	19.5	19.3	18.0	18.4	18.7	18.5	
	(micrograms per cubic metre) Source: OECD	OECD average	15.5	14.0	13.9	13.1	13.1	13.2	13.1	
Additional indicators	Nitrate in groundwater	SK	15.9	15.2	15.9	14.1	13.2			
	(milligrams per litre) Source: Eurostat	EU average	23.5	23.1	24.4	23.7	23.8			
	Phosphates in rivers	SK	0.08	0.11	0.10	0.10	0.09			
	(milligrams per litre) Source: Eurostat	EU average	0.07	0.07	0.06	0.06	0.07			
	Share of industry in GDP	SK	22.8	23.6	23.4	22.4	21.5	22.2	22.0	21.7
	(percentage) Source: Eurostat	EU average	17.9	17.5	18.1	18.0	17.8	17.5	17.1	16.2
	Population connected to waste water treatment systems	SK				63.6	65.0	65.7		
	(percentage) Source: Eurostat	EU average	73.0	78.1	72.7	76.2	73.9	71.9		

Category	Score	2010	2014	2015	2016	2017	2018	2019	2020
Outcome indicators	Mean population exposure to PM2.5	-0.96	-0.85	-0.83	-0.77	-0.87	-0.88	-0.88	
Additional indicators	Nitrate in groundwater	0.63	0.60	0.61	0.72	0.75			
	Phosphates in rivers	-0.07	-0.82	-0.81	-0.93	-0.42			
	Share of industry in GDP	-0.93	-1.08	-0.81	-0.70	-0.61	-0.78	-0.84	-1.08
	Population connected to waste water treatment systems				-0.57	-0.41	-0.24		

Table 25 Waste production indicators

Category	Indicator		2010	2014	2015	2016	2017	2018	2019
Outcome indicators	Generation of municipal waste per capita	SK	319	320	329	348	378	414	421
	(kilograms per inhabitant)	EU average	479	467	469	488	499	505	513
	Recycling rate of municipal waste	SK	9.1	10.3	14.9	23.0	29.8	36.3	38.5
	(percentage)	EU average	26.7	33.0	35.2	37.4	37.9	38.4	39.9
Additional indicators	Recycling rate of packaging waste	SK	45.7	65.4	64.3	65.8	65.7	66.6	
	(percentage)	EU average	59.9	62.6	63.4	64.9	64.4	64.7	
	Recovery rate of packaging waste	SK	47.5	68.0	66.7	69.5	68.6	69.1	
	(percentage)	EU average	70.8	74.2	74.9	76.5	76.2	77.2	
	Landfill rate of waste	SK	55.0	52.0		47.0			
	(percentage)	EU average	35.3	32.2		30.4			

Table 25 Waste production indicators (continued)								
Category	Score	2010	2014	2015	2016	2017	2018	2019
Outcome indicators	Generation of municipal waste per capita	1.35	1.18	1.11	1.02	0.94	0.71	0.70
	Recycling rate of municipal waste	-1.00	-1.51	-1.33	-0.97	-0.56	-0.14	-0.09
Additional indicators	Recycling rate of packaging waste	-1.15	0.32	0.10	0.10	0.14	0.25	
	Recovery rate of packaging waste	-1.19	-0.36	-0.48	-0.42	-0.45	-0.51	
	Landfill rate of waste	-0.85	-0.79		-0.72			

In Slovakia there is scope to adjust the tax mix in favour of environmental taxes. Environmental tax revenues and their share of total public revenues are slightly below the EU average, while the implicit tax rate on energy is significantly lower. Since the level of these taxes is still relatively low, there is scope to shift part of the tax burden from the taxation of labour to the taxation of environmentally harmful activities.

Table 26 Environmental policy indicators							
Indicator		2010	2015	2016	2017	2018	2019
Implicit tax rate on energy	SK	118	191	187	185	185	178
(EUR per tonne of oil equivalent)	EU average	184	219	222	221	222	223
Environmental tax revenues	SK	2.1	2.5	2.5	2.5	2.5	2.4
(percentage of GDP)	EU average	2.6	2.7	2.7	2.7	2.6	2.6
Share of environmental taxes in public revenues	SK	7.4	7.7	7.6	7.5	7.2	7.0
(percentage)	EU average	7.6	7.6	7.6	7.5	7.3	7.1
Environmental protection investments	SK	0.4	0.8	0.4	0.4		
(percentage of GDP)	EU average	0.6	0.7	0.4	0.4	0.3	
National expenditure on environmental protection	SK	2.2	2.3	1.9	1.9		
(percentage of GDP)	EU average	1.9	2.0	1.8	1.9	1.6	
Score		2010	2015	2016	2017	2018	2019
Implicit tax rate on energy		-0.97	-0.35	-0.44	-0.45	-0.46	-0.60
Environmental tax revenues		-1.00	-0.31	-0.35	-0.19	-0.25	-0.30
Share of environmental taxes in public revenues		-0.13	0.03	-0.05	0.02	-0.02	-0.10
Environmental protection investments		-0.57	0.30	0.19	0.33		
National expenditure on environmental protection		0.66	0.48	0.09	-0.03		

Slovakia's expenditure on environmental protection[38] is around the EU average. In 2017 the share of total expenditure allocated to current and capital expenditure on environmental protection was close to the EU average. Given the challenge of achieving climate neutrality by 2050, both Slovakia and the other EU countries are expected to increase this expenditure.

[38] This refers to overall expenditure in the economy, i.e. including private sector expenditure.

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9 Priorities

The Slovak economy is facing a middle-income trap and urgently needs structural reforms if convergence with western European living standards is to accelerate. Slovakia's recovery and resilience plan (RRP) for accessing funds from the EU's Recovery and Resilience Facility (RRF) represents a unique opportunity to move the country forward through structural reforms and investment in key areas. Economic growth based on the accumulation of not so productive assets is reaching its limits. The current quality of human capital is hampering the development of an innovation-driven knowledge economy. At the same time, the economy must undergo a green transformation so that economic progress is compatible with the country's commitment to achieve climate neutrality by mid-century. Amid this transformation, we should also be vigilant about the increasing risks associated with the economy's vulnerabilities. A particularly serious cause of concern is the long-term sustainability of public finances. There is also the challenge of bringing Slovakia's population up to average EU levels, not only in living standards, but also in health outcomes, which at present are far below par. Last but not least, inclusive economic growth will require the integration of disadvantaged groups in the labour market and the elimination of gaps between them and the rest of the population in terms of living conditions, education, and state of health.

To close the economic gaps with western Europe will require higher productivity growth and increased integration of the population in the labour market. Reform efforts in this area can greatly help mitigate the risks related to competitiveness loss and to public finance sustainability. Reform priorities in this area should include:

- equipping people with the knowledge and skills needed in the 21st century labour market, via the education system (from pre-school to university), lifelong learning programmes, and active labour market policies; hence the need to reform curricula, to improve school infrastructure, to make teaching a more attractive career choice, and to improve the higher education sector (by reforming university governance, increasing the internationality of the sector, and boosting the quality and financing of its R&D);
- building up Slovakia's innovation potential, especially in cutting-edge areas (Industry 5.0, the digital economy, artificial intelligence, robotisation, e-mobility, the hydrogen economy); reforming and increasing the financing of R&D, while making R&D more international and strengthening its links with the private sector; and investing in digital infrastructure;
- improving the business environment, law enforcement, and the quality of public institutions, including their digitalisation.

The green transformation of the economy over coming decades will require significant investment, which will be repaid in the form of lower climate change-related costs, the development of green sectors in the economy, and a better quality environment. Another key factor in this regard will be the efficient use of the available EU funding (RRF funds and structural funds). Reforms and investment in this area should be primarily focused on:

- decarbonising the industry and energy sectors through investment in modern technology and renewable energy sources; reducing coal combustion and transforming the Upper Nitra region;
- increasing energy efficiency, including the renovation of public buildings and single-family houses;
- transitioning to sustainable transport, through investment in e-mobility, rail and other public transport, and cycle infrastructure;
- supporting the circular economy and removing legacy environmental burdens;
- implementing measures under the National Air Pollution Control Programme (NAPCP);
- adapting to climate change.

Once the fallout from the pandemic has faded, the public deficit and debt will have to be reduced. As regards public finances, the following steps are vital:

- to reform the pension system, including by restoring the automatic adjustment of the statutory retirement age to life expectancy, by making the retirement age more flexible (calculating pensions in a way that incentivises remaining in the labour market), and by increasing the efficiency of saving in the system's second pillar;
- to introduce spending caps and to strictly implement measures resulting from spending review assessments integrated in the budgetary process (the Value for Money project);
- to improve prioritisation and the management of public investment;
- to improve tax collection and to shift part of the tax burden from taxation on activity to environmental and wealth taxes.

As regards the state of health of its population, Slovakia lags far behind western Europe; its health system is financially unsustainable and health facilities suffer from underinvestment. To improve this situation, the following is necessary:

- to consistently implement efficiency-increasing measures identified in the health spending review;
- to reconfigure the hospital network and improve the management of public hospitals;
- to address the unbalanced age structure of health personnel, to reduce staff shortages (mainly shortages of GPs and nurses), and to expand the competencies of GPs and nurses;

- to make efficient use of the EU's RRF and structural funds so as to eliminate the investment gap in the health sector; in this regard, it will be crucial to secure the future resources needed to maintain new and modernised facilities, so that the benefit from the monies spent is maximised;
- to complete the digitalisation of the health system and to support the use of modern technology (telemedicine, automation, and artificial intelligence).

In the area of social inclusion, the following is necessary:

- to increase and improve the efficiency of spending on active labour market policies aimed at integrating disadvantaged groups in the labour market;
- to use family policy to support the participation of woman of childbearing age in the labour market, for example by supporting the use of day nurseries or by offering higher parental leave benefit over a shorter period;
- to reduce gender pay gaps and to support equality of opportunity;
- to expand pre-school education and improve the inclusivity and quality of the education system, so as to enhance the outcomes of the weakest in society (with a focus on desegregating schools in areas with a higher Roma population);
- to improve the living conditions and basic infrastructure of the Roma population, including their access to health care and health awareness.

Slovakia's draft recovery and resilience plan[39] responds to most of these reform priorities and represents a unique opportunity to improve people's quality of life and the economy's innovation potential and to support the greening of economy. Several sources of EU funding will be available to use within the next ten years, including the RRF (€6 billion), the outstanding amount (€8 billion) of the 2014–2020 budget allocation, and the 2021–2027 budget allocation (€13 billion).

Risks, however, exist in regard to how reforms are actually implemented and to whether the available funds can be used efficiently. Of particular importance in this regard is the specific configuration of particular reforms and how the reforms are communicated to stakeholders and the broader public. As for the ability to use funds in a way that ensures value for money, this will be subject to risk, especially given past experience with using EU funds. Having regard to the timeframe, another challenge will be to incorporate the planned reforms in the management of public investment in the actual RRP projects.

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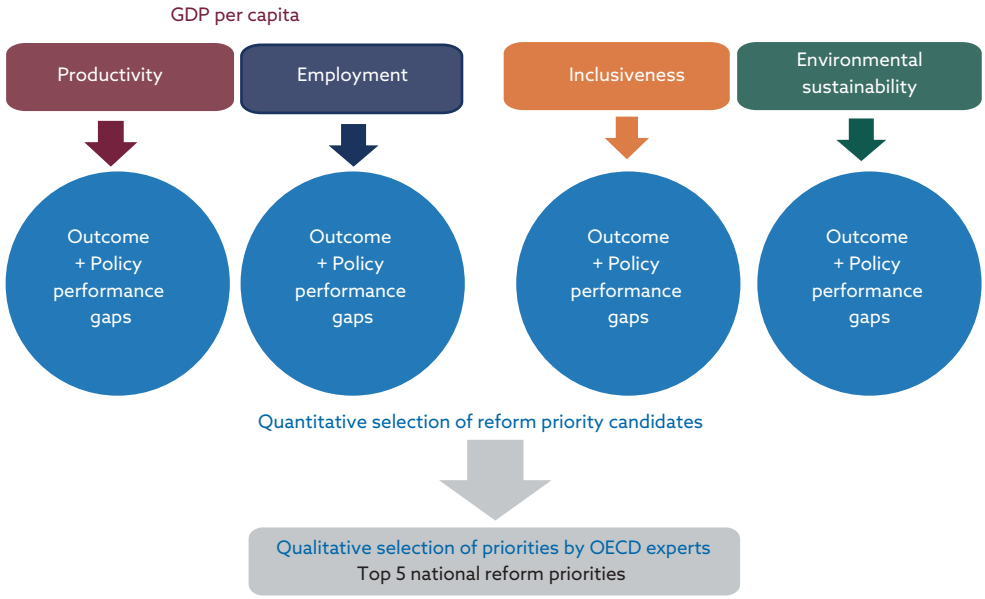
[39] https://www.slov-lex.sk/legislativne-procesy/-/SK/LP/2021/112

10 Annex

10.1 Analytical concept

The analytical concept used by Národná banka Slovenska is similar to the OECD's approach[40] focused on reform priority selection. That approach is anchored in a decomposition of GDP growth (through the GDP indicator) into labour productivity and labour utilisation. In addition to these dimensions are those of inclusiveness and environmental sustainability. Each dimension is then assigned outcome indicators (e.g. total factor productivity growth) and additional indicators or relevant policy indicators (e.g. product market regulation). Based on a comparison of outcome and additional indicators with the OECD average, each country's problematic areas are identified and subjected to a country-specific qualitative analysis by OECD experts. This analysis results in the selection of the "Top 5 priorities".[41]

Figure 3
OECD approach



Source: OECD.[42]

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[40] Economic Policy Reforms 2019: Going for Growth, OECD Publishing, Paris.

[41] In Slovakia, a similar approach was followed by the Institute for Environmental Policy (IEP) in identifying waste management, air quality, and forest quality as the country's three main environmental challenges, and by the Institute for Financial Policy (IFP) in identifying primary education, health, and the labour market as three challenges facing the Slovak economy; see respectively: "Tri výzvy životného prostredia na Slovensku: Medzinárodné porovnanie kľúčových indikátorov životného prostredia" (Three environmental challenges in Slovakia: An international comparison of key environmental indicators), IEP, January 2017; "Tri výzvy slovenskej ekonomiky: Aktualizácia identifikácie priorít Slovenska" (Three challenges for the Slovak economy: Update of the identification of Slovakia's priorities), IFP, March 2019.

[42] Economic Policy Reforms 2019: Going for Growth, OECD, 2019, p. 30.

The Bank's approach significantly expands on the OECD's approach, in particular by the inclusion of the areas of economic vulnerabilities and health. This is because GDP growth can occur at the price of economic overheating or competitiveness loss, or even financial stability risks or public finance sustainability. The inclusion of the health dimension reflects its importance to the well-being of the population, in addition to its direct economic effects on the quality and quantity of human capital in the economy.

Figure 4
Dimensions of the NBS analytical concept

Dimensions	Economic performance	Economic vulnerabilities	Social inclusion	Health	Environment
Categories	Productivity Employment	Macroeconomic stability Competitiveness Public finance sustainability	Poverty Equality of opportunity	Healthy lives Quality of health care	Climate neutrality Pollution Waste generation

Calculation methodology for reference indicator scores

We conduct a gap analysis by comparing Slovakia's outcomes in each dimension or additional area with reference countries. In order to compare different areas, the individual indicators are transformed into a relative score. The score used in this report is the same as that used by the Institute for Financial Policy in a 2015 publication[43] (and that publication's 2019 update) and by the Institute for Environmental Policy in a 2017 publication.[44]

The specific score of indicator j for country i is expressed as the difference between the value of indicator x_i^j and the unweighted average of the reference group of countries $\bar{x}^j$ normalised by standard deviation sd^j:

$$score_i^j = (-1)\frac{x_i^j - \bar{x}^j}{sd^j}$$

[43] "Tri výzvy slovenskej ekonomiky: Metodika identifikácie priorít Slovenska" (Three challenges for the Slovak economy: A methodology for identifying Slovakia's priorities), IFP, March 2015.

[44] "Tri výzvy životného prostredia na Slovensku: Medzinárodné porovnanie kľúčových indikátorov životného prostredia" (Three environmental challenges in Slovakia: An international comparison of key environmental indicators), IEP, January 2017.

Where a lower indicator score denotes a better outcome for the country, the score is then multiplied by -1. Positive scores therefore always denote above-average outcomes.

Normalisation therefore enables the comparison of scores of different indicators. If, then, the country-specific indicator values are assumed to have a normal distribution, the score will have a standardised normal distribution. Thus, under these simplified assumptions, the score value also expresses the position of the country-specific outcome within the distribution of all outcomes for the given indicator.

The reference countries comprise EU Member States unless the indicator refers to an OECD database, in which case they include also non-EU members of the OECD. In this respect, it should be underlined that $\bar{x}^j$ expresses an **unweighted** average for the available reference countries. In the text and tables, this average is referred to as the "EU average" (abbreviated in the charts to EU), or "the OECD average". Given the purpose of the analysis – to identify successful or unsuccessful structural policies – it does not seem appropriate to weight the results by size of population. In a few cases, when we want to focus on the indicator value for the "average" EU citizen, we refer to the "EU27 average".

The selected approach also has certain downsides that need to be taken into account when formulating conclusions. The most obvious is its relativity. In cases where all the reference countries have significant room for improvement in a certain area, our approach may not sufficiently stress the need for structural reforms.

In other cases, a country-specific situation needs to be taken into consideration. For example, the problem of marginalised Roma communities in Slovakia is so specific that it cannot be evaluated using this approach. In such cases, we use national data, expert judgements, and the available analyses and research in these areas.

Equally important to note is that our approach is limited by the quality, comparability and availability of data in cases where the sample of countries can change according to the source database or availability of data.

10.2 Structural policies and monetary policy

Structural policies are policies of a regulatory and institutional nature designed to ensure long-term income growth, economic resilience, inclusion, and social fairness. Increases in long-term/potential growth and shock resilience contribute to price and wage flexibility and stimulate the efficient reallocation of production factors. These policies significantly support the

effective implementation of the primary objective of price stability, mainly through their impact on the equilibrium interest rate, on the functioning of the Economic and Monetary Union (EMU), and on the country's competitiveness within EMU.[45]

The problem of monetary policy transmission when the equilibrium interest rate is declining

When the equilibrium real interest rate is at low levels, the scope for conventional monetary policy transmission via the interest rate channel is limited. If non-standard monetary policy instruments cannot ensure that the current real interest rate is, if necessary, at its equilibrium level, or low enough relative to it, the result will be lower economic growth and weaker inflation. In such a case, the central bank's pursuit of its price stability mandate is severely hampered.

According to some economists, signs of secular stagnation appeared in the world's advanced economies in the wake of the great financial crisis and its origins predated the crisis. According to Summers (2014), for example, changes in the structure of the economy may have led to a significant shift in the natural balance between savings and investment, causing a decline in the equilibrium real rate of interest that is associated with full employment. That shift, according to the author, has a number of aspects: reductions in demand for debt-financed investment;[46] slower potential growth (owing to demographic changes and possibly to a slower rate of technological progress); changes in the distribution of income (both between labour income and capital income and between those with more wealth and those with less); a substantial shift in the relative price of capital goods; and global accumulation of safe assets. The response to this situation may include, in addition to expansive monetary and fiscal policies, polices of a structural nature, such as changes in the tax and regulatory system designed to support and stimulate investment and trade.

Secular stagnation can also be seen as primarily a supply-side problem. According to Gordon (2015), the post-crisis secular stagnation reflects the slowness of growth in both labour productivity and in aggregate hours of work, the slow growth in the latter being due to slowing population growth and to a decline in labour force participation. The decline in labour

[45] See, for example, Masuch et al. (2018), which focuses on the issue of structural policies in the euro area.

[46] This may in part be caused by excessive business sector leverage, by restrictions on the financial sector resulting from the financial crisis, and by the digital economy's lower demands on capital investment.

productivity growth is, according to the author, the result of technological innovation providing less benefit than it did in the past, lower business dynamism, and the lower accumulation of human capital.

Rachel and Smith (2017) argue that changes in global trend growth do not adequately explain the decline in the global equilibrium exchange rate that preceded the great financial crisis, but rather they assume that the trend growth slowdown resulting from demographic changes and headwinds at the technological frontier may contribute to a further slowdown in the period ahead. For these authors, a more important factor behind the decline in global interest rates has been shifts in saving and investment preferences. The saving rate has increased on the back of demographic changes, higher inequality within countries, and a preference shift towards higher saving by emerging market governments following the Asian crisis. According to them, investment demand has been undermined by a fall in the relative price of capital goods and a preference shift away from public investment projects.

Similarly, Brand et al. (2018) attribute the decline in equilibrium real interest rates in advanced economies since the 1980s to population ageing,[47] waning productivity growth, and a surge in risk aversion in the wake of the great financial crisis (resulting in a greater spread between yields). According to the authors, unconventional monetary policy measures and higher inflation targets can offer only partial solutions and are associated with risks and costs.[48] A return to higher natural interest rates must, in their view, come from productivity-boosting structural policies and from the raising of the retirement age in combination with measures to sustain the human capital of ageing populations.

Going forward, climate change and the public policy response to it will also be significant in shaping the environment in which monetary policy fulfils its mandate. Any backsliding on measures necessary for the decarbonisation of the economy (and resulting increase in the frequency and severity of climate change-related economic fluctuations) may greatly hamper efforts to achieve price stability without incurring significant side effects. By contrast, effective "green" investments can raise productivity growth in the economy and hence also the real equilibrium interest rate.

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[47] Lower labour supply depresses the marginal product of capital and therefore also the natural interest rate. Higher life expectancy has an upward impact on the saving ratio, as people increase their saving in anticipation of a longer retirement period. The impact of these factors is, partially offset by a rising proportion of dissavers (as the age composition of the population shifts towards relatively older individuals).

[48] Besides being difficult to reconcile with price stability mandates, permanently raising inflation targets may also not be a credible policy in a situation where inflation expectations are falling.

The pursuit of structural reforms therefore complements monetary policy in an effective way, particularly in an environment of very low interest rates. Structural reforms which result in higher potential output or which mitigate adverse demographic developments can increase the equilibrium real interest rate by expanding the room for monetary policy manoeuvre.

Structural policies and the optimal functioning of monetary union

Structural policies can ease the problem where a monetary union's single monetary policy may not be able to stabilise all the countries in the union at the same time. Under a monetary union, where a single monetary policy responds to economic shocks, the effectiveness of monetary policy is conditioned by the necessary degree of synchronisation between the constituent economic units as well as by the existence of other prerequisites for the policy's smooth functioning (mainly mobility of labour and capital, product diversification, and financial and fiscal integration). If these elements are absent or lacking, monetary policy transmission can become uneven and inefficient.

The problem of the costs associated with losing the stabilisation function of the exchange rate and independent monetary policy is addressed by Mundell (1961). In his theory of optimum currency areas (OCAs),[49] he argued that if prices and wages are not flexible, and if labour and capital are insufficiently mobile, asymmetric shocks within the monetary area will lead to a situation in which the single central bank will be able to stabilise certain countries or regions, but not the whole union at the same time.

McKinnon (1963) expanded the discussion to include, in addition to the above-mentioned structural characteristics, the degree of openness (and interdependence) of the currency area's economies. Greater openness results in foreign prices having a larger impact on the domestic price level, which reduces the effect of money illusion in wage bargaining and the potential positive effect of depreciation. The more open the economies within a monetary union, the lower the costs related to losing the exchange rate effect as an equilibrium-restoring mechanism. Kenen (1969) emphasises the importance of consumption and production diversification. Similarly, Kenen (1969) and Mundell (1973) point to institutional characteristics such as financial and fiscal integration.

Structural policies can therefore lead directly to greater business cycle synchronisation, an increase in shock resilience, and optimal functioning of monetary union. The question of how to increase resilience at the

[49] For information about the development of optimal monetary policy theory, see, for example, Mongelli (2005) and Dellas and Tavlas (2009).

individual country level primarily involves addressing the efficiency of the country's institutional settings, the quality, development and efficient allocation of its human capital, the optimal ways of using its primary resources and technologies, and product-market regulation and innovation. Well formulated structural policies therefore increase well-being in society through inclusive growth in living standards and contribute to sustainable development and convergence between individual countries.

Public finance sustainability and financial stability are key prerequisites for the effective functioning of monetary policy, especially in a monetary union. The great financial crisis revived discussion about monetary policy optimality also in this respect. According to Shambaugh (2012), the euro area faced three interlocking crises: macroeconomic divergence associated with loss of competitiveness in the periphery relative to the core, a sovereign debt crisis, and a financial crisis. Furthermore, the size of the problem was amplified by the interconnections between the crises. A slump in lending from an unsound banking sector and consolidation measures in response to unsustainable public debt exacerbated adverse macroeconomic trends in the periphery. Moreover, weak economic growth was increasing the periphery's debt quota and uncertainty about the debt servicing capacity of periphery governments, all of which only further raised the interest costs of the countries affected and heightened their fiscal difficulties. Governments saw their fiscal stance deteriorate as a result of banking sector bailouts, while, vice versa, concerns about sovereign solvency had a detrimental impact on the soundness of the banking sector. In addition, the sluggish real economy was adversely affecting the banking sector through rising loan delinquencies and the falling value of banking assets.

The great financial crisis revealed two key problems. The first was the euro area periphery's loss of competitiveness and the widening of imbalances within the bloc. In the absence of an independent monetary policy and exchange rate channel, loss of competitiveness requires a relatively lengthy and painful process of equilibrium restoration. Structural reforms designed to support labour market flexibility and increase productivity are therefore gaining in importance with respect to the economic policies of individual Member States and to the preservation of their competitiveness within the monetary union.

The second key problem concerned EMU's institutional framework and resulted in the adoption of measures essential to the preservation of the single currency and the strengthening of its resilience. The euro area crisis was overcome with help from the ECB's active efforts (employing QE and OMTs) and through fiscal bailout mechanisms at the European level (the EFSF, EFSM and ESM). These measures led to the bailing out of

countries with unsustainably high debt ratios, a general decrease in debt servicing costs for euro area countries, and, in some cases, the bailing out of national financial systems. There was also a strengthening of financial sector regulation, including new macroprudential policy instruments. As for the EU's banking union, it has made progress but remains incomplete.

The pandemic crisis has further stepped up pressure for further deepening of the EU's capital markets union and of fiscal integration. The size and symmetric nature of the negative economic shock triggered by the global pandemic exposed the absence of EU-level fiscal instruments that could have provided a flexible response to this situation. **Structural policies in respect of the euro area's institutional arrangements therefore have the potential to increase the monetary union's resilience**, as well as to relieve monetary policy of the disproportionate pressure of being the first line of defence against euro area crises (and not only such crises). New fiscal instruments, such as funding under the EU's Recovery and Resilience Facility (conditioned by the implementation of structural reforms) will be part of the European Semester framework, so further increasing the importance of structural policy analysis.

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