

productivity report 2022

*The cover photo is a work by Portuguese artist Nidia Dias from the DeepMind research lab's "Visualising AI" project, which seeks to make artificial intelligence more accessible. The artists first participated in several conversations with scientists, engineers and researchers about the role of and responsibilities associated with such technology and its contribution to social well-being and sustainable development, before using these conversations as a catalyst to create original artworks. Of course, readers are free to interpret the image as they wish, but we would like to take this opportunity to remind you of the brand "**Slovenia. Green. Creative. Smart**".*

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Key messages and guidelines

Current situation and trends...

... in Slovenia's productivity and competitiveness

The low level of productivity is central to Slovenia's lag in GDP per capita.

Productivity, measured as GDP per person employed (in PPS), reached 84% of the EU average in 2021. This is 1.7 p.p. higher than in the previous year and represents a greater progress compared to both the Visegrad countries (V4) and the innovation leaders. However, it only means that after more than a decade of slow productivity growth, Slovenia's gap with the EU average has returned to the level it was at before the onset of the global financial crisis in 2008. At the same time, Slovenia's productivity lead over the V4 narrowed significantly over the period 2008–2021, while the gap with the innovation leaders remained almost unchanged. All Slovenian regions lag behind the average productivity level in the EU. The already small regional productivity differences have narrowed even further, which means that the differences in GDP per capita are mainly arising from differences in employment rates.

In addition to higher investment, increasing efficiency will also be key to further accelerating productivity growth throughout the economy.

Given the ageing population and the already high employment rate, raising productivity is key to improving prosperity. While trend labour productivity growth has picked up since 2017 and is now slightly below 2%, this is due to more modest investment activity or capital deepening, especially by the corporate sector but also by the population, still more than 1 p.p. lower than before 2008. In order to further accelerate productivity growth, in addition to higher investment, total factor productivity growth needs to be further strengthened, i.e. production factors should be used more efficiently.

In the long term, productivity was driven by the more export-oriented parts of the economy: over the period 2005–2021, the highest increase in value added per hour worked in real terms was recorded in manufacturing, 71%, which is above the EU average (41%) but much lower than in the Visegrad countries (98%). Traditional market services also achieved fairly high productivity growth in the long-term, while ICT services deviated negatively compared to other countries. The relatively high productivity growth of the export-oriented parts of the economy is reflected, among other things, in the competitive position on foreign markets, as the export market shares of goods and traditional market services has increased over the long term. In recent years, export competitiveness has been strengthened or at least maintained by the majority of energy- and emissions-intensive activities, which are currently most exposed to the challenges of the energy crisis and the urgent green transition. However, knowledge-based services have long represented an untapped potential.

To increase efficiency, sound economic policy is needed in the short term, while more ambition is required in addressing long-term opportunities and challenges.

In 2022, as the economy cools, there are signs of a gradual cyclical slowdown in real productivity growth in the business sector, while the export market share in the goods market started to decline already in 2021. Labour cost growth increased slightly in the first half of 2022 against a backdrop of high inflation and labour shortages, and growth in prices of market services also accelerated. Should the situation worsen, domestic cost pressures could add to the global cost pressures that began to intensify in 2021 due to the sharp increase in energy and non-energy commodity prices. This requires a sound economic policy aimed at ambitious promotion of long-term productivity growth, which will, among other things, allow for sustainable wage growth while maintaining a competitive position.

... in financial performance of companies

Notwithstanding the fact that the financial situation of the corporate sector remains strong for the time being...

The overall financial situation of the corporate sector remained quite favourable in 2021. With low indebtedness and over-indebtedness and high profitability and liquidity, companies' debt repayment abilities continued to improve, reaching the most favourable figures since 2006. However, the corporate debt increased slightly as measures to mitigate the impact of the epidemic were gradually lifted and investment activity resumed. At the same time, the financial situation deteriorated significantly in certain segments of the economy: in 2020, the ability to repay debt temporarily deteriorated in some of the market services most affected by the COVID-19 epidemic (accommodation and food service activities, arts and recreation), while in 2021 it deteriorated in holding and leasing companies. Nevertheless, the share of companies with a relatively high risk of insolvency was already lower in 2021 (14.2%) than during the global financial crisis. The shares of these companies in terms of employment, capital and value added of the entire corporate sector were even lower than in 2008.

... new challenges require an economic policy response, especially in support of the healthy cores of the economy.

Given that the solvency of the corporate sector had not deteriorated by mid-2022 and the number of bankruptcy proceedings initiated against legal entities and sole proprietors was lower in the first nine months of 2022 than in the same period of 2019, it appears that the corporate sector has weathered the COVID-19 crisis quite successfully with the help of a number of intervention measures. On the other hand, the corporate sector is now facing new challenges due to the war in Ukraine and emergency situations, especially in the energy markets, amid high inflation and monetary policy tightening. The related economic policies must strive at supporting healthy cores of the economy that are not over-indebted and are viable in the long term, especially development-oriented niche parts of the economy that have great growth potential.

... in a changed global economic context

De-globalisation tendencies represent an opportunity to strengthen economic activity which is currently under-exploited in Slovenia.

The changed political context in a number of countries, increasing protectionism, the trade war between the US and China, the COVID-19 pandemic, the geopolitical situation related to the war in Ukraine, and the green and digital transformation are having a profound impact on the structure of global value chains (GVCs). Globalisation has increased the geographic and sectoral concentration of GVCs, which also poses major risks for international business related, for example, to exposure to suppliers of critical raw materials or countries with a dominant market position and to the underestimation of the total costs of offshoring. Due to widespread supply chain disruptions in relation to de-globalisation tendencies, the trend of GVC deepening and strengthening has reversed in recent years.

International integration of service activities should be strengthened and functions performed in non-service activities upgraded.

The changes in GVCs are crucial for Slovenia's competitiveness, as the country is strongly integrated into them as a small open economy, although there is still untapped potential. In the period 2010–2018, the share of foreign value added in Slovenian exports increased more than on average in the EU and V4, while at the same time the share of Slovenian value added exports in GVCs is below the average of the EU, innovation leaders and V4 countries, which is also related to the size of the Slovenian economy. On a per capita basis, Slovenia generates much higher value added in exports than the V4, but the gap with innovation leaders points to the need to further strengthen the international integration of service activities, especially knowledge-based ones, and to upgrade the functions performed by Slovenian companies in non-service activities.

At the same time, the transformation of GVCs may be reflected in reshoring of production or parts of production to Europe, which may represent an opportunity for Slovenia as for other Central and Eastern European countries. Available data show that companies are reacting to increased supply chain disruptions with greater caution in the form of increased inventories, while at the same time surveys, for example of German companies, confirm that companies are seriously considering reshoring or nearshoring their manufacturing operations. Survey data for Slovenian companies show that there have been no major changes in the production locations of companies or their subsidiaries in the last two years; companies only report of a change in the geographical structure of input suppliers.

... and under the impact of the transition to a low carbon and circular economy

As environmental pressures increase, so does the global ecological deficit, which in the period 2014–2018 again increased relatively rapidly also in Slovenia. As the current growth model is not sustainable and is leading to an environmental crisis, commitments have been made at global, national and EU levels to reduce greenhouse gas (GHG) emissions and transition to climate neutrality. According to the adopted strategic targets in the National Energy and Climate Plan (NECP), GHG emissions in Slovenia are to be reduced by about one-third by 2030 and completely eliminated by 2050, but the national targets will have to be revised upwards due to the more ambitious EU targets. Both to achieve climate neutrality and to stop the growing pressure related to the overuse of natural resources, their expected scarcity and the associated price increases, it is necessary to decouple economic growth from GHG emissions growth and the use of natural resources, i.e. to move from a linear to a circular economy.

The green transition will be characterised by large-scale changes in the structure of the economy...

The cumulative, long-term impact of climate change on economic activity and employment is assessed to be modest, but the transition will be challenging due to the changed economic structure, which will be reflected in the following in particular:

- a) Activities under pressure from green transformation. These are activities that contribute most to accelerating climate change and where the changes will be most radical (energy, mining, energy-intensive industry, construction and agriculture). Particular attention must be paid to preventing carbon leakage across borders and addressing those areas and groups most affected by the transition process.
- b) Less polluting activities and especially activities that have a positive impact on the environment. These will be characterised by positive trends, as they will open up new opportunities for development and new jobs that will require new skills.

... with the net benefits or costs depending on the ambition and speed of the transition to an integrated smart circular economy.

A decade ago, sustainability at the corporate level was seen more as a niche concept and a function of public relations. In recent years, however, it has become a prerequisite for corporate success and a source of new competitive advantage. Not only is the green transformation of the corporate sector being accelerated by legislation, which will become even stricter in the coming years, but at the same time consumers, investors and employees increasingly expect a focus on sustainability. In the future, this trend will become even more pronounced, including in Slovenia, in part due to generational effects. Businesses must therefore optimise their activities from the perspective of creating wider economic, social and environmental benefits in order to maximise environmental benefits in the medium and long term in accordance with a new paradigm of an integrated smart circular economy.

Key factors with recommendations on how to move forward

With an agile business environment and ecosystem approach

Despite making some progress in recent years, Slovenia remains in the bottom half of EU Member States in terms of institutional performance and the quality of the business environment.

An effective institutional framework is the key to a supportive business environment. Slovenia has made progress in several areas in recent years, notably in insolvency legislation, the efficiency of the judiciary, the modernisation of public procurement, the reduction of administrative barriers and bureaucratisation, and the introduction of digital public services. International comparisons show that many other countries have made even greater changes, however, which is why Slovenia still ranks in the bottom half of EU Member States regarding most institutional performance indicators.

De-bureaucratisation and business support ecosystems for a more responsive and flexible functioning of the state remain a priority.

Addressing structural problems in the institutional environment, especially de-bureaucratisation, therefore remains a priority, and from a productivity perspective, government accountability and efficiency, especially in supporting the business activity, is becoming an increasingly important challenge. The latter refers both to public services provided directly by the State and to the creation of a scientific research, innovation and digital ecosystems, which is also very important for the green transition. In this respect, Slovenia's lag is greatest in the indicators of participation and government responsibility, where the country's ability to respond and adapt to an increasingly fast-changing and complex environment is also increasingly important for productivity and competitiveness.

The tax system is often mentioned as one of the obstacles to doing business. We expect that further reductions in the tax burden will be difficult to implement, given the development challenges and the tax changes adopted so far, which have resulted in record-low tax revenues as a percentage of GDP. However, this means that it is all the more important to address weaknesses related to the complexity of the tax system, in particular the number of tax procedures and the time needed to comply with tax obligations, and the frequency of changes in tax legislation, including tax rates.

With an inclusive attitude and strengthening of social capital

Social capital is an increasingly important productivity factor and has an impact not only on the business operations of companies, but also on the quality of life in society in general. Analyses for Slovenia have for many years shown a strong identification of workers with the work organisation, the workplace and employment, but at the same time their assessments of the quality of employment and earnings, material well-being, and, above all, their health and work ability were poor.

Strengthening social capital will not only improve the quality of life in Slovenia and increase its attractiveness, but also strengthen its resilience.

In terms of employee engagement and percentage of successful employees, Slovenia ranks in the middle of EU Member States, but at the same time Europe as a whole ranks third in terms of success and last in terms of employee engagement among the ten major regions in the world. Employee engagement thus remains a challenge, and in terms of self-assessment of employee performance, Slovenia still lags far behind the innovation leaders, despite making progress compared to 2011.

Among the factors of employment and job quality, more attention should be paid to making working time more flexible, not least to enable a better reconciliation of family and work, and to health and safety at work measures. Slovenia scores better than the EU average on the cognitive development of workers. More workers find their tasks interesting and are given autonomy in their work, but at the same time they are less likely to solve challenging tasks or unforeseen problems independently. Worker participation in management and decision-making in companies and other organisations is also below the EU average and that of the innovation leaders, and issues such as health and safety at work and risks relating to digitalisation are less often discussed with workers, while maintaining productivity levels is discussed more often.

With human resources development

Human resources are one of the most important factors holding back productivity growth.

In Slovenia, the lack of suitable labour, knowledge and skills is becoming one of the most important limiting factors for increasing productivity and economic development. Slovenia faces one of the largest labour shortages and the gap with the innovation leaders in terms of labour availability has widened.

Therefore, there is an urgent need to strengthen the available human capital in line with changing needs...

The educational level of the adult population and the labour force has been improving for several years, but at the same time the mismatch between supply and demand in the labour market is increasing. The proportion of people with tertiary education employed in occupations for which at most an upper secondary qualification is sufficient is increasing, due to the following factors, among others: (a) a mismatch between upper secondary and tertiary enrolments and the demand for labour, indicating a lack of strategic planning for human resource development, and (b) too slow and unambitious transformation of the business sector. Adapting and strengthening the skills and competences of young people while ensuring intensive retraining of workers, including older persons, are shaped by the green and digital transformation and other changes that are crucial for productivity growth and require, among other things, a greater emphasis on transversal skills.

... and also to attract and integrate labour from abroad, while accelerating automation processes.

Immigrants and migrants who are not in employment or do not have access to labour market (e.g. applicants for international protection and persons under international protection) are also a potential source of additional labour, which suggests the need for more proactive migration and integration policies. In general, Slovenia should more actively attract professionals from abroad and other staff by simplifying procedures, providing information, and generally improving working conditions and opportunities for professional development.

With a strategic transition to innovation-driven growth

Slovenia has made progress in recent years, but not enough to narrow the gap with the leading countries or to keep the advantage over V4 countries.

The transition to innovation-driven growth is the basis for increasing value added and thus catching up with economically most advanced countries. Slovenia's gap with the EU average of the European Innovation Index has narrowed since 2019 after a sharp deterioration in 2017–2019, but the 2015 index value was not reached until 2022. At the same time, Slovenia's gap with the innovation leaders has not narrowed significantly, while its lead over V4 has narrowed noticeably.

It is crucial to accelerate all innovation-related investments, including in soft forms of intangible capital, at both the government and corporate levels.

The main reason for the slow transition to innovation-led growth over a longer period of time is insufficient investment from both the public and the business enterprise sectors. Slovenia's investment in innovation-driven growth (in R&D, ICT, and other machinery and equipment) fell sharply after 2008, so the gap is still large compared to the 2000–2008 period, despite the trend reversal in recent years. With regard to the softer forms of intangible capital, Slovenia made progress when it comes to investing in design and branding. At the same time, however, it is at the bottom of EU Member States when it comes to training in enterprises and improving organisation and business processes, and it also lags behind when it comes to investment in education, especially at the tertiary and secondary levels.

The efficiency of the scientific research and innovation ecosystem has been improving in a number of elements...

Human resources in research, development and innovation activities remain Slovenia's competitive advantage, but the trend is negative. On the other hand, strong positive trends have been observed over the last three years in the areas of innovation activity of the business sector, quality of the research system, and integration and cooperation, all of which represent comparative advantages for Slovenia compared to the EU. Moreover, the gap with the innovation leaders has been narrowing. In 2018–2020, innovation activity of enterprises reached its highest level in the last decade, with only SMEs lagging behind innovation leaders, which is linked to the above-mentioned trend reversal in investment in innovation-led growth since 2016, also in the context of resumed development policy. At the same time, early-stage entrepreneurial activity remains low by international comparison, but it is encouraging that at the same time the proportion of early-stage entrepreneurs who have entered entrepreneurial activity due to perceived promising business opportunities rose noticeably again in 2021 after a decline in 2020, reaching its highest level ever.

... with negative trends in human resources, connectivity and, increasingly, too shallow automation and digital transformation of the corporate sector.

In the period 2017–2022, Slovenia improved its ranking among EU Member States in the area of digitalisation of the economy and society, but at the same time its lead over the EU average (according to DESI) continues to shrink, and in the global comparison Slovenia even fell from 31st to 37th place between 2020 and 2022. Slovenia is losing its relative advantage in connectivity and digital technology integration, but it is making progress in digital public services. In the area of human resources which are crucial for digitalisation, Slovenia remains slightly below the EU average and is increasingly falling behind the innovation leaders and losing its lead over the Visegrad Group.

Slovenia's competitive advantage over the EU has also gradually narrowed and its gap with innovation leaders in the areas of digitalisation and automation of the business sector has widened, with Slovenia remaining relatively competitive in robotisation and e-sales. At the same time, Slovenia continues to lag behind in integration, especially in the more sophisticated (digital) technologies, which is one of the indicators showing that the modernisation processes are still relatively shallow and not as thorough as in other countries. The data on companies Industry 4.0 adoption maturity also points to stagnation, as between 2018 and 2022 the proportion of companies demonstrating a high level of readiness actually fell from 26.3% to 24.4% of the companies surveyed.

More ambition is needed in strengthening organisational factors, while paying more attention to disruption, creativity and innovation.

The pace of a profound digital transformation of companies is slow and not even the COVID-19 crisis has noticeably helped to accelerate progress: the crisis mainly led to an accelerated use of basic digital tools (e.g. communication tools) and, for example, an increase in online sales, while its impact on the use of more sophisticated technologies or their integration was much smaller. In order to accelerate productivity growth, Slovenian companies must not only accelerate the adoption of individual

(more sophisticated) technologies, but also undertake a more comprehensive and ambitious (digital) transformation, both in terms of digitalisation and sustainability and in terms of strengthening organisational factors, with a stronger focus on disruption, creativity and innovation.

The main reasons for progress being too slow at company level include an unsystematic approach to (digital) transformation, low awareness of its importance and impact, a lack of staff and knowledge, and insufficient willingness to change, while the cost aspect, which is extremely important for small companies, also poses a challenge for medium and large companies when it comes to sophisticated technologies.

And towards a low-carbon circular economy

Despite improvements in environmental productivities, a more decisive shift is needed in the future.

Total GHG emissions and energy and material consumption have declined over the long term, and associated emissions, energy and material productivity have improved. However, the gap with the EU average (with the exception of material productivity) has not narrowed significantly, so the transition to a low-carbon and circular economy requires even stronger measures. This is especially true for the use of renewable energy sources, which increased the least in Slovenia of all EU Member States in the period 2005–2020. On the other hand, the biggest changes have been made in the circular material use rate, which has doubled in the last ten years and has approached the EU average.

The need to accelerate the green transition is further dictated by rising commodity prices, especially the sharp increase in energy prices. In the corporate sector, the burden of material costs on revenue generally declined over the period 2008–2021, which has had a positive impact on the growth of value added and productivity. The surge in material and commodity prices in 2021 has also not yet been reflected in an increase in the ratio of material costs to revenues, which means that generally companies have either passed higher material costs to higher prices or increased their resource efficiency. In view of the sharp rise in energy prices, cost pressure started to increase in 2022.

So far, companies have successfully coped with the growing cost pressure...

Particular attention should be paid to energy- and emissions-intensive manufacturing activities (manufacture of paper, non-metallic mineral products and metal products and the chemical industry), which are at greater risk of carbon leakage as they are more exposed to international competition. It is encouraging that in the period 2008–2021, the companies that are the largest energy consumers were more successful than average in reducing the burden of energy costs and that the majority of energy- and emission-intensive products were able to maintain or even improve their competitive position on the world market, which, however, with comparatively lower tax burdens on individual energy sources, was also a consequence of the slow progress in meeting climate and energy targets.

... but sustainable change needs to be accelerated significantly at both the company and country levels.

Accelerating the sustainable transformation of the business sector is crucial in the face of growing pressures – and also opportunities –, even though Slovenian companies are much less concerned about the impact of climate change on their business than companies in most other EU Member States. The main motivation for companies in Slovenia are savings and legal requirements, which is reflected in short-term-oriented measures to cope with cost pressures or simply the introduction of internal monitoring of the achievement of sustainability goals. However, Slovenian companies lag far behind in promoting sustainable investments and in the overall

sustainable transformation of companies in terms of product differentiation, the use of advanced sustainable technologies and the innovation of sustainable business models.

In order to achieve the energy and climate goals, the Government will also have to significantly accelerate its activities, with between EUR 11.6 and 12.3 billion available for these purposes in the period 2021–2030. Since, according to the National Energy and Climate Plan, investments of EUR 28 billion would be required, this indicates a considerable gap, which, however, is not insurmountable with an appropriate, broad-based economic and sustainability policy. In addition to incorporating the investment potential of private sources, the upgraded policy must also include a broad package of measures, from price-based instruments, subsidies and standards to the development of new technological solutions, the modernisation of infrastructure, the promotion of sustainable entrepreneurship, retraining and awareness-raising (for more detailed recommendations for the government and the business sectors, see Section 4.2.4).

1 Introductory remarks

In accordance with the Council Recommendation (2016), each Member State appoints a National Productivity Board, whose functions in Slovenia are carried out by the Institute of Macroeconomic Analysis and Development (IMAD). Based on objective, neutral and fully independent analyses of productivity and competitiveness, the National Productivity Boards produce annual reports with the aim of improving economic policies.

In the Productivity Report, unless otherwise stated, the term productivity refers to labour productivity, which measures how much value added is created on average per unit of work (per employee or per hour worked).¹ In the face of negative demographic trends leading to a shrinking working-age population, productivity is gaining importance as the main source for strengthened economic development, which is a prerequisite for a better quality of life and well-being of the population.

Productivity growth has been slowing not only in Slovenia but also globally in the last two decades: in Slovenia from more than 3% before 2009 to about 2% and in more developed economies from about 2% in the decade before 2005 to about 1% in the decade after 2005. Reasons for the slowdown mentioned in the literature include weak investment, especially in the increasingly important intangible capital, weak aggregate demand, population ageing, poorly adapted labour market institutions, declining trade flows, structural market barriers, declining allocative efficiency and increased market concentration, while lower measured productivity growth could also be related to measurement errors (Goldin et al., forthcoming). It is essential to note that productivity growth depends on a plethora of different factors, the importance of which varies from country to country (ibid.), meaning that appropriate economic policy can only be designed by taking into account the situation and trends in each individual country.

Therefore the second chapter of the Productivity Report 2022 first presents Slovenia's position on the global map of productivity and competitiveness, including an analysis of the financial performance of companies until 2021 and a presentation of the changed economic context the world is facing. The third chapter analyses the key factors that explain why Slovenia is making progress in improving its productivity, albeit at a slower pace than other countries: the business environment, social and human capital, and factors related to the transition to innovation-driven growth. The fourth chapter examines Slovenia's productivity and competitiveness in the context of the transition to a low-carbon and circular economy, which is the central theme of this year's report. The importance of green transition at both macro and corporate levels is presented, as is the state of the Slovenian economy in terms of its readiness for urgent transformation, including due to increasing cost pressures. The chapter concludes with recommendations for the State and the corporate sector. The 2022 Productivity Report was prepared using data available until 31 October 2022.

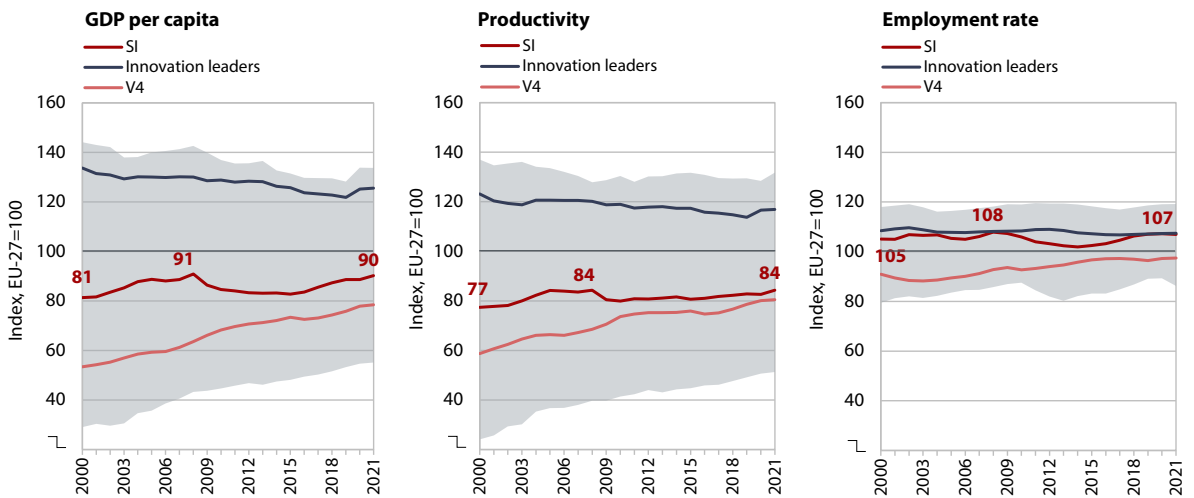
¹ This is not the only measure of productivity. For example, total factor productivity is a measure of the speed of technological progress and new business models, while controlling for human and tangible capital deepening, which in principle can be more informative. However, as the quality of data in Slovenia does not allow for a sufficiently credible assessment of total factor productivity (see IMAD, 2019a), the report focuses on labour productivity.

2 Slovenia on the global map of productivity and competitiveness

2.1 Current situation and trends in productivity and competitiveness

After more than a decade of slow growth in productivity, in 2021 Slovenia’s lag behind the EU average returned to the level before the global financial crisis. Following a substantial increase during the global financial crisis, the lag behind the more developed countries (and with considerably less favourable trends compared to the countries of the Visegrad Group and the new EU Member States in general) had been gradually decreasing to finally, with a boost in growth in 2021, see productivity return to 84% of the EU average (in PPS). The lower productivity level is a key factor in Slovenia’s gap in GDP per capita (90% of the EU average in PPS in 2021), as the employment rate² (the ratio between employment and population) in Slovenia was higher than the EU average in the entire observed period.

Figure 1: GDP per capita is below the EU average due to lower productivity; however, with the boost in 2021, productivity returned to the 2008 level



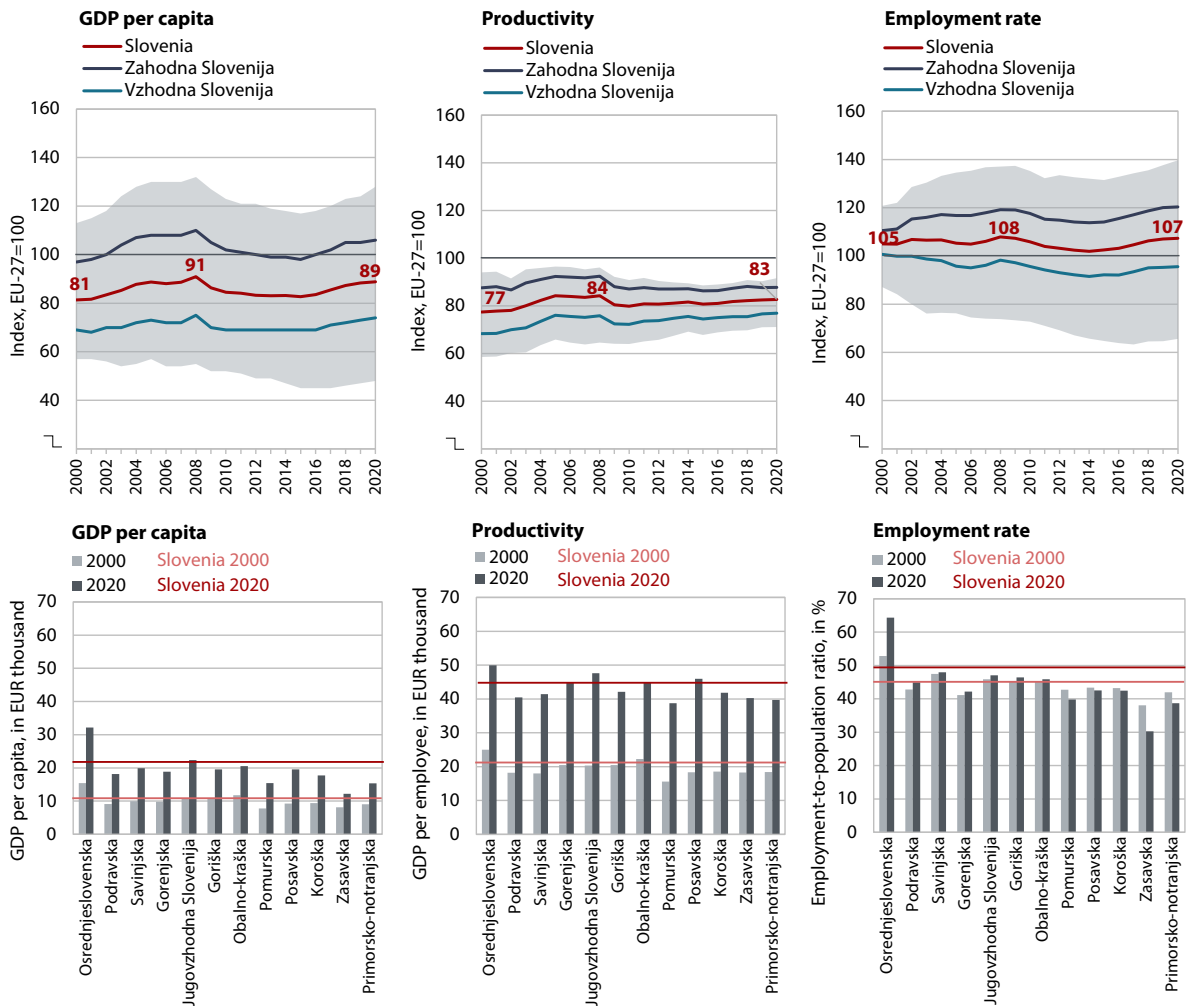
Source: Eurostat (2022c); calculations by IMAD. The GDP per capita and productivity (GDP per employee) indicators are expressed in purchasing power standards (PPS), i.e. adjusted for purchasing power. The shaded area shows the range between the EU Member States with the lowest and the highest values of the indicator, excluding Luxembourg and Ireland. Innovation leaders: SE, FI, DK, BE, NL; V4: CZ, HU, PL, SK.

All Slovenian regions lag behind the average productivity in the EU and the already small regional differences have further reduced. The Osrednjeslovenska region, which has the highest productivity among the Slovenian regions, reached 92% of the EU average in productivity level (in PPS) in 2020, while the Pomurska region lagged behind the EU average the most (71% of the EU average in PPS). In 2000–2020, Slovenia came closer to the EU average due to the regions with lower productivity reducing the gap, while the regions with higher productivity fell slightly behind. Comparatively small differences in productivity among the Slovenian regions thus became even smaller. However, regional differences in employment

² An increase in GDP per capita can be achieved through an increase in productivity or an increase in employment rate.

rate increased, partly due to changes in the demographic structure of the regions.³ Although the difference in GDP per capita between the two regions with the highest and lowest values increased between 2000 and 2020, the joint effect of the dynamics of regional variation in employment and productivity since 2009 was still reflected in a falling dispersion of GDP per capita by regions.⁴

Figure 2: Regional differences in productivity are small in Slovenia; great differences in employment rate – partly due to demographic structure – are the key reason for disparity in GDP per capita



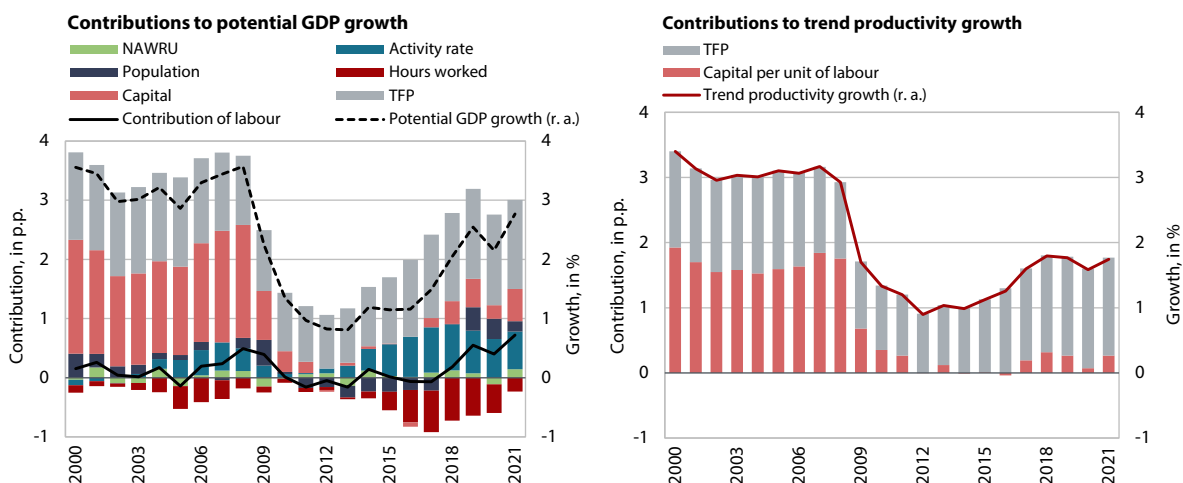
Source: SURS (2022d), Eurostat (2022c); calculations by IMAD. Note: The shaded area shows the range between the regions with the lowest and the highest values of the indicator. In the bottom charts, the regions are arranged in order of population size.

³ In the Zasavska, Pomurska and Primorsko-notranjska regions, which have the lowest GDP per capita and the lowest employment rate, the share of older people is increasing with above-average speed. The opposite is the case in the Osrednjeslovenska region, which is also a region with considerable immigration (from other regions and abroad) and daily migrations.

⁴ The dispersion of GDP per capita increased between 2000 and 2020 solely on account of the initial period (until 2009). Since 2009, it has shown a marked downward trend, with the exception of the epidemic year 2020. In addition to the difference between the two regions with the highest and lowest values, the more comprehensive measures of dispersion also confirm that regional differences in productivity are reducing and differences in employment rate increasing.

Due to the ageing population and the already high labour market participation, a rise in productivity, in particular hourly productivity, is crucial for increasing well-being. There is a trend of reducing working time per employee in Slovenia, as in the EU and euro area generally (see Figure 4). This is also related to the high employment rate⁵ (the share of employed persons in the population), which is promoted by, among other things, the increasing participation of women⁶ and older workers (ECB, 2021). Slovenia has one of the fastest ageing populations among EU Member States and one of the highest participation rates, particularly among women (while the participation of older people is among the lowest in the EU). Currently, with almost full employment, the majority of new employments are of foreign nationals. Due to the limited domestic (and foreign) labour force as a result of the shrinking working age population, the opportunities for further growth in GDP per capita, which would provide the conditions for improving material well-being, mainly depend on increasing hourly productivity, i.e. value added per hour worked.

Figure 3: Despite strengthening in the last five years, the modest capital deepening is still the main reason for the trend growth in labour productivity being lower than before the global financial crisis



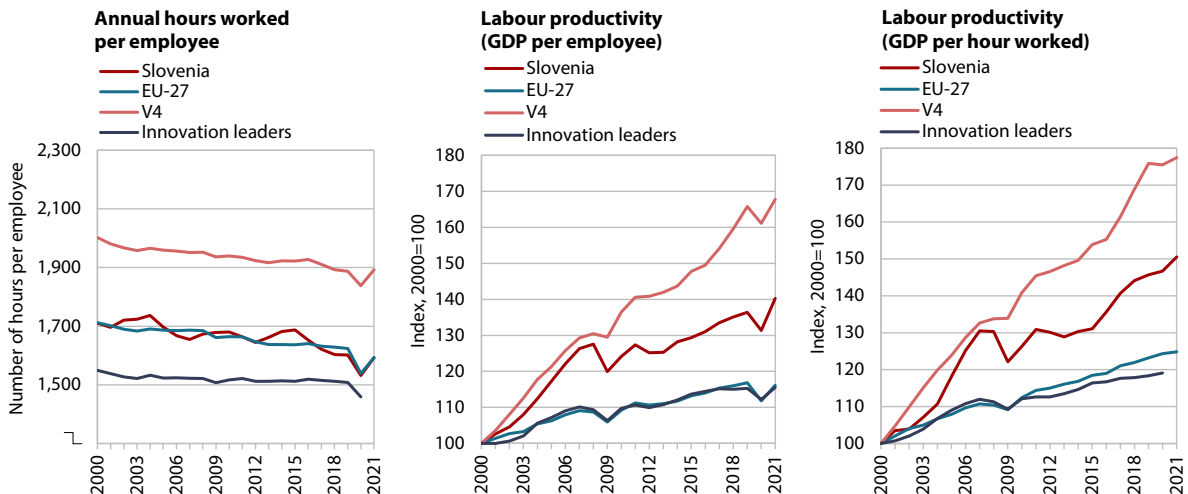
Source: Eurostat (2022c), SURS (2022d); calculations by IMAD. Notes: NAWRU: the natural rate of unemployment. Trend productivity growth is growth excluding the cyclical effect; it is defined as the growth of potential GDP minus the potential contribution of the production factor of labour. Potential GDP is calculated according to the production function method. For details on the methodology, see, for example, Chapter 4 of IMAD's Autumn Forecast (2022a).

Since 2017, trend labour productivity growth has been accelerating again; however, due to the modest capital deepening, it remains more than 1 p.p. lower than before the global financial crisis. During the global financial crisis and subsequent sovereign debt crisis, total factor productivity (TFP), i.e. the effective use of production factors, contributed the most to the growth in labour productivity. In contrast, the contribution of capital deepening or the capital stock per unit of labour decreased considerably. The investments of the business sector were particularly low, which was mostly due to the greater uncertainty and relatively modest profits in this period.⁷ The Slovenian economy came through the upheaval resulting from the COVID-19 epidemics mostly well (high profits and liquidity and relatively low indebtedness in 2021⁸), and the loss of human capital was mitigated considerably by the job-retention schemes supported by the large-scale anti-corona measures.

⁵ Euro area countries with relatively few hours worked per employee have relatively high employment rates and vice versa. The downward trend in hours worked per employee is also related to the increase in the employment rate.
⁶ Between 2000 and 2019, the rise in the participation of women contributed 90% to the increase in the total participation in the euro area. The probability of part-time work is greater for women.
⁷ See Section 3.5.1, "Fixed capital investments".
⁸ See Section 2.1, "Financial operations of companies".

At the same time, high government spending in the years of the epidemic additionally restricted the fiscal space, including for dealing with the energy crisis and related high raw material prices. Increasing investments – including, or in particular, those in the efficient (and circular) use of raw materials – is an important potential for growth in added value and productivity.⁹

Figure 4: The downward trend in hours worked per employee and quick rebound of productivity after the initial shock caused by the outbreak of the COVID-19 epidemic



Source: Eurostat (2022c); calculations by IMAD. Note: The labour productivity indicators are presented in constant prices. Innovation leaders: SE, FI, DK, BE, NL; V4: CZ, HU, PL, SK.

In the epidemic years (2020 and 2021) the export sector continued to be the main lever for productivity growth and catching up to the more developed EU Member States.

In the industrial sector, productivity measured by value added per hour worked increased by 60% (in the EU by 35%) in real terms in 2005–2021. In the most export-oriented segment – *manufacturing* – it increased by 71%, which is more than the EU average (41%) but considerably less than in the Visegrad countries (98%). Productivity growth in energy- and emission-intensive manufacturing activities (paper, chemical products, non-metallic mineral products and metals) was slightly lower (53%), although in the last 15 years it has still exceeded the growth in the majority of EU Member States.¹⁰ It is encouraging that productivity growth in these activities was also relatively high even in 2021 (4.7%; average in manufacturing activities: 3.8%), when some energy-intensive industries were already facing high raw material prices. The *traditional market services*, in particular the increasingly export-oriented *transport*, have also been achieving very high productivity growth (in relation to the average in the business sector and the EU average). According to EU trends, in particular in the innovation leaders, *ICT services*¹¹ stand out negatively among the market-oriented services; however, in recent years productivity growth has also accelerated in this sector. In 2021, all these activities noticeably exceeded the pre-epidemic productivity levels, also compared to the EU average. In Slovenia and other EU Member States, *public services*, which have a significant impact but whose added value and consequently productivity are more difficult to measure, are showing slow productivity growth.¹²

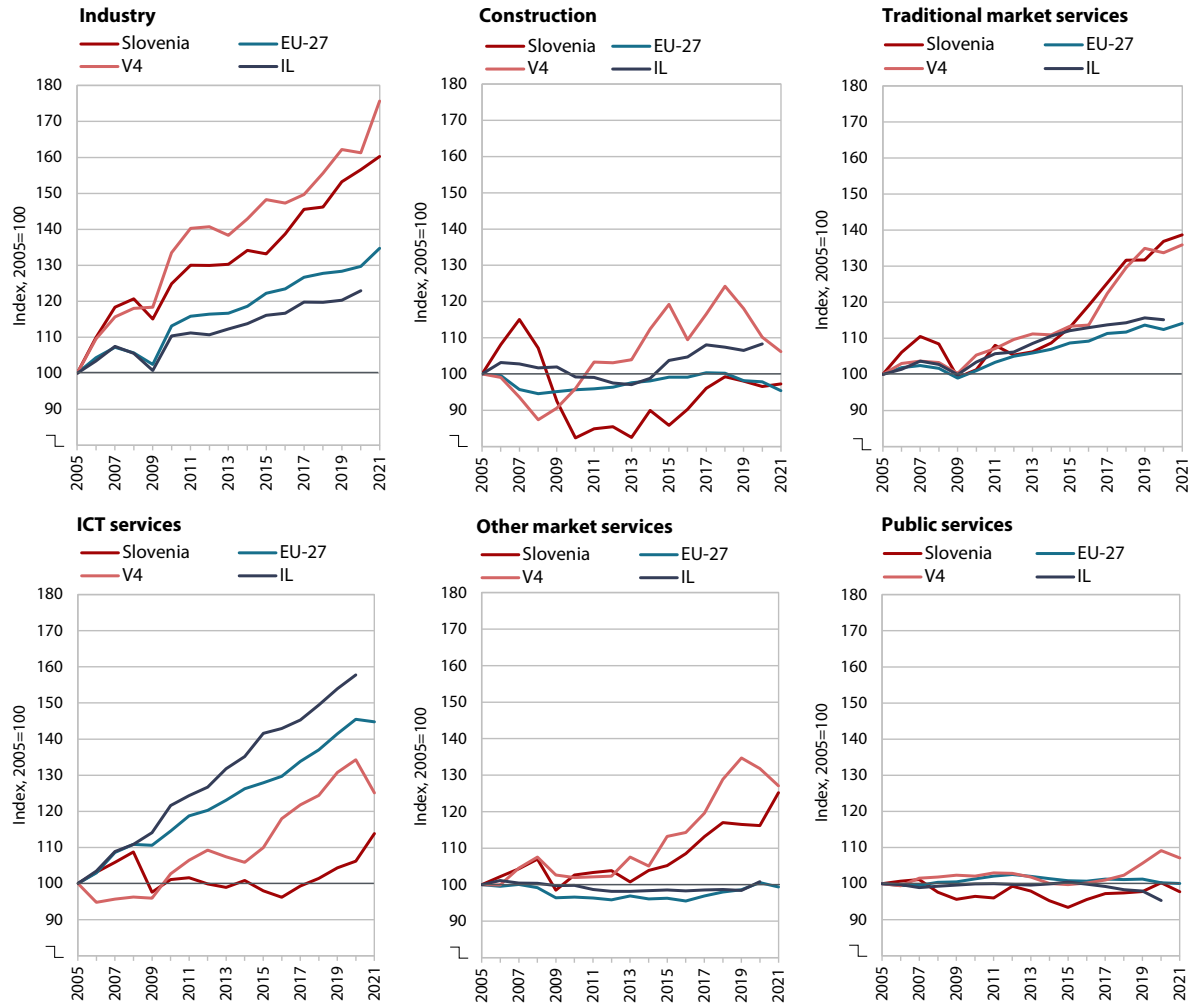
⁹ See Section 4.2.1, “Exposure to cost pressures and competitiveness”.

¹⁰ For more information on energy- and emission-intensive industries, see Section 4.2.2.

¹¹ The direct impact of ICT services on aggregate productivity is small due to the relatively small size of the sector. Their potential indirect impact through the introduction and transfer of new technologies and processes to the companies engaged in other activities is much greater.

¹² Although this is more difficult to assess statistically, public services have a significant direct and indirect effect

Figure 5: Growth in productivity and its approximation to the EU are driven by the export-oriented segments of the business sector



Source: Eurostat (2022c); calculations by IMAD. Note: At the sectoral level, the labour productivity indicator is calculated as the ratio between the added value (in constant prices) and the hours worked. **Industry:** mining (SKD B), manufacturing (SKD C), energy supply (SKD D), municipal utility services (SKD E); **Construction** (SKD F); **Traditional market services:** trade (SKD G), transport (SKD H), accommodation and food service activities (SKD I); **ICT services** (SKD J); **Other market services:** financial services (SKD K), professional, scientific and technical activities (SKD M), other business activities (SKD N); **Public services:** public administration (SKD O), education (P), healthcare and social assistance (Q). Innovation leaders: SE, FI, DK, BE, NL; V4: CZ, HU, PL, SK.

In the first two quarters of this year, the growth of business sector productivity slowed, while the relatively high labour cost growth accelerated due to labour shortage and high inflation. After the initial shock at the onset of the epidemic, the productivity of the business sector (measured per employee) in Slovenia quickly rebounded. In the second quarter of 2022, it exceeded the pre-epidemic level (seasonally adjusted) by 9%,¹³ while the current data for this year show a gradual slowdown in the real productivity growth.¹⁴ With labour shortage and high inflation, the relatively high growth in labour costs slightly accelerated; in the second quarter

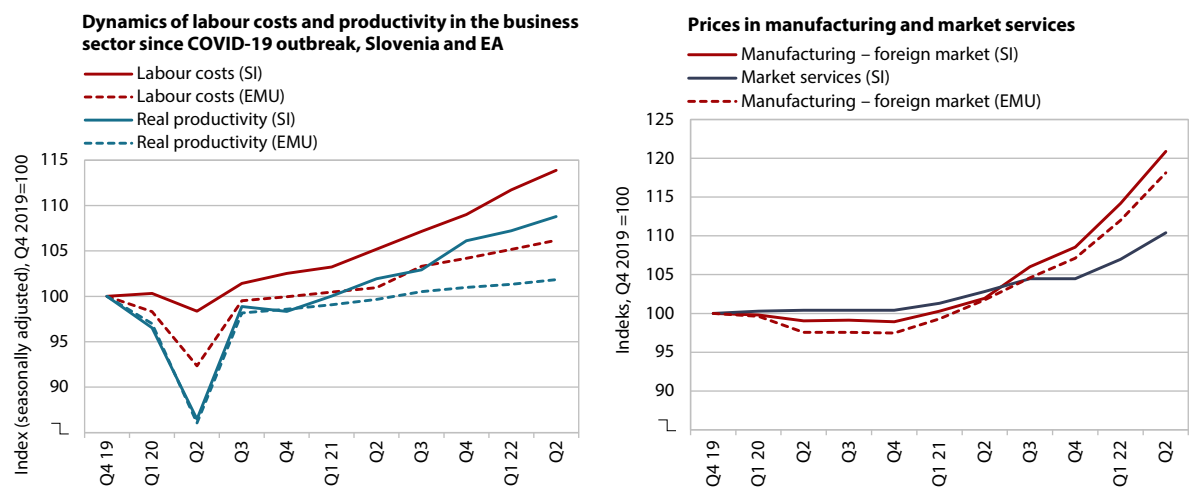
(e.g. through the quality of services or the business and institutional environment) on aggregate productivity – see Section 3.1.

¹³ According to the seasonally and working-day adjusted data, the productivity measured per hour worked was also 5% higher in the second quarter of 2022 than in the last quarter of 2019, i.e. before the COVID-19 epidemic.

¹⁴ Data for the third quarter of 2022, which were published after the cut-off date (end of October) and for which data on labour costs and international comparisons were not yet available at the time of the compiling of the report, show a noticeable (1.4%) reduction in the real productivity of the business sector. Due to the high rise in prices (GDP deflator), the *nominal* labour productivity continued to grow.

of 2022, they exceeded the pre-epidemic level by 14% (the average in the euro area was 6%). By the middle of 2022, no significant gap in the growth of unit labour costs (which shows the ratio between labour costs and productivity) has been detected between Slovenia and euro area trade partners.¹⁵ In the conditions of high inflation and the expected cooling of economic activity and (cyclical) slowdown in productivity growth, the demands for a significant rise in wages (in both the business and the public sectors) could lead to an increased risk of a wage inflation spiral and a deterioration of the cost-competitive position of exporters, in particular in the event of a greater gap between the trends in Slovenia and in the main trade partners. Thus the domestic cost factors (labour costs and service prices) could start to have a more significant impact on export prices (measured by industrial producer prices), which started to rise in 2021 due to the pronounced rise in raw material prices on the global markets.

Figure 6: Real productivity growth has been cyclically slowing in 2022, while wage growth continues



Source: Eurostat (2022c), SURS (2022d); calculations by IMAD. Note: Real productivity: labour productivity (GDP per employee) in constant prices; labour costs: nominal personnel expenditures per employee. Prices in market services include transport (SKD H), accommodation and food service activities (SKD I), ICT activities (SKD J), professional, scientific and technical activities (SKD M), and other business activities (SKD N).

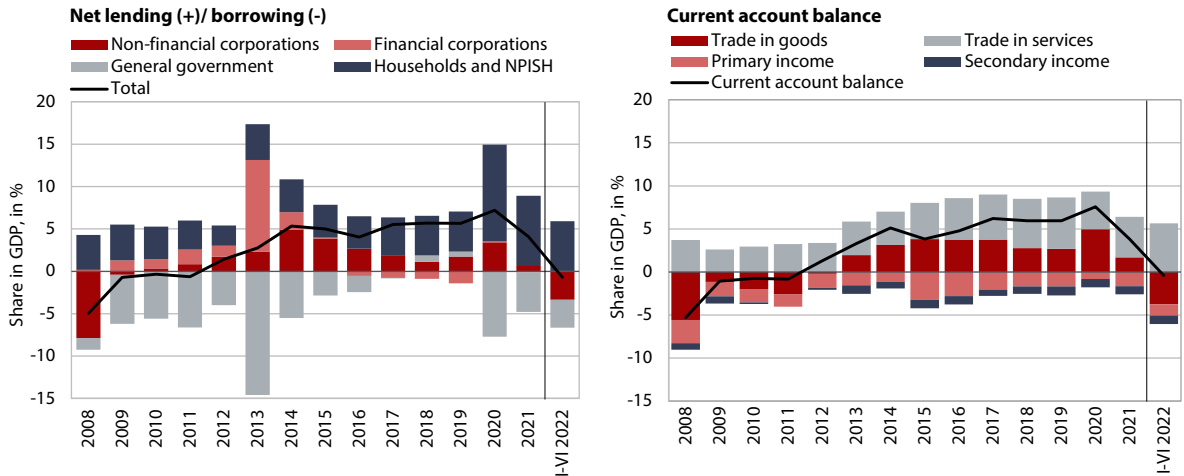
In the first half of 2022, with high domestic consumption, the current account balance turned from surplus to deficit for the first time in ten years. In conditions of export-driven growth, cautious household spending, modest investment activity and deleveraging of banks and companies, Slovenia has had a surplus on the current account of the balance of payments since 2012. In 2020, the surplus additionally increased and exceeded 7% of GDP, mostly due to a further increase in net household savings. Following a considerable reduction towards the end of 2021, in the first half of 2022, with 23% year-on-year growth in nominal exports and 37% in imports, the balance turned from a surplus to a deficit (of 0.4% of GDP). The growth in import demand was promoted by strong private consumption, which was a result of a further increase in the population's disposable income. Business results, which remained favourable in the epidemic years, facilitated the renewal of investment activity.¹⁶ Large-scale government measures to mitigate the consequences of the epidemic, and recently also price increases, contributed to the relatively high net government borrowing. In terms of the main items on the current account, the

¹⁵ Compared to pre-epidemic levels, the growth in the nominal labour costs in euro area countries rose more only in the Baltic states; however, due to the higher productivity growth, unit labour costs in Slovenia did not deviate much from the trends in the euro area average.

¹⁶ Although it is still considerably lower than in the years before the global financial crisis.

only item positively contributing to the balance was trade in services, in which the surplus (5.6% of GDP) approached the levels seen before the onset of the COVID-19 epidemic. In the first half of this year, partly also due to deterioration of the terms of trade, the goods deficit amounted to 3.8% of GDP, which was the greatest deficit since 2008.

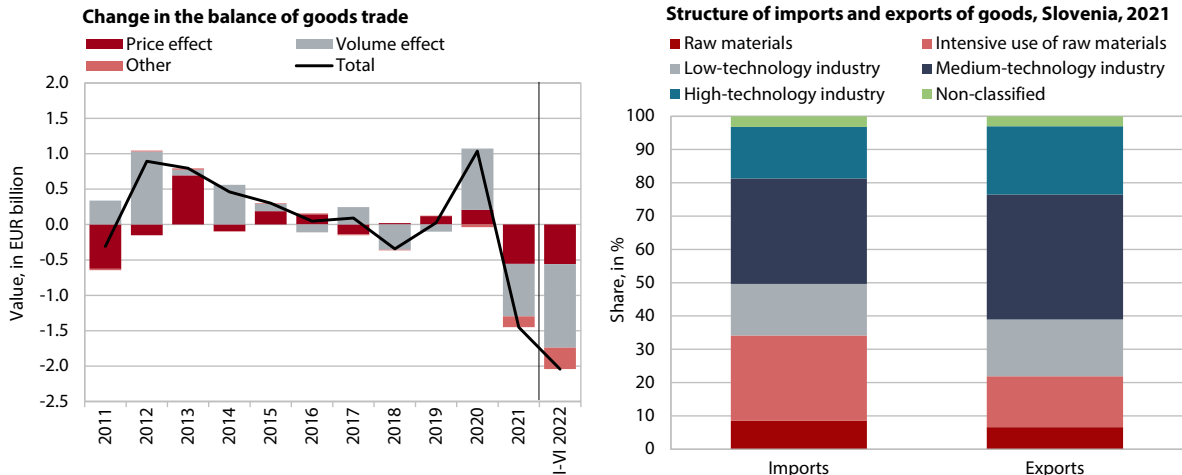
Figure 7: Net borrowing and a trade deficit for the first time in ten years



Source: SURS (2022d); BoS (2022d); calculations by IMAD.

In addition to quantity effects, price effects have also contributed considerably to the significant deterioration of the goods balance since the second half of the last year. The goods balance, which started to decline in the second half of 2021, was EUR 2 billion lower in the first half of 2022 than in the same period last year. Most of the difference can be explained by the slowdown of the growth being more pronounced in real goods exports than in imports (the *quantity* effect). The cooling of economic activity in the most important export partner, Germany, and the continuing unfavourable trends in the car industry (see the paragraph on market share in the EU market) contributed significantly to the current export slowdown. *Price* effects also had a great impact on the change in the goods balance both this year and last. Rising prices of energy products and non-energy raw materials on the global markets considerably raised the cost of their imports in 2021 and 2022, which was further exacerbated by euro depreciation. Slovenia imports roughly 30% more raw materials than it exports and is even more dependent on importing with regard to products whose production is based on intensive use of raw materials. Raw materials and products based on the intensive use of raw materials together represent more than one-third of Slovenian goods imports (against slightly more than one-fifth of exports). These are mostly imports for intermediate use, which, through the rise in the cost of imported materials, transfer to higher prices and/or lower margins and profits of domestic producers.

Figure 8: The pronounced growth in the prices of mostly imported raw materials greatly contributed to the deterioration of the goods balance



Source: SURS (2022d), BoS, UN Comtrade (2022); calculations by IMAD. Note: Products by technological classification (Lall, 2000). The trade in pharmaceutical products with Switzerland is excluded from the Slovenian imports and exports of goods (figure right), as their impact on economic activity is negligible and is not included in the data on national accounts and balance of payments (figure left).

In 2021, the multiyear growth in the export market share on the global goods market also came to a halt, while the services market share continued to grow.

During the global financial crisis, Slovenia's cost-competitiveness deteriorated significantly under the impact of declining productivity (2009) and, considering the economic circumstances, relatively high wage growth (2010)¹⁷ coupled with the appreciation of euro.¹⁸ This led to a pronounced¹⁹ fall in the Slovenian export market share on the global market, one of the greatest in the region. Over the following years, the market share grew and returned to the pre-crisis level. However, in 2021 the *goods export market share* fell again (by 1.5%), while the *services market share* maintained strong growth (of 5.6%). In both epidemic years (2020 and 2021), the growth in goods and service exports and in export market share were negatively affected by structural factors, i.e. the *specialisation* of Slovenian exports to markets that were more affected and grew more slowly during the epidemic (e.g. vehicles, travel and transport). With regard to goods, in the second half of 2021 the contribution of *performance*, which reflects the competitiveness of Slovenian exporters, also started to fall. Nevertheless, the latter is not yet showing such pronounced signs of deterioration as during the global financial crisis. Namely, the increase in cost pressures due to the growth in global raw material prices, which was already high last year, did not affect only Slovenian producers and exporters. While domestic cost factors arising from the relatively high wage growth (compared to trade partners) were significantly mitigated by the large-scale anti-corona measures aimed at the business sector (in particular in 2020)²⁰ and the faster rebound of productivity (2021).

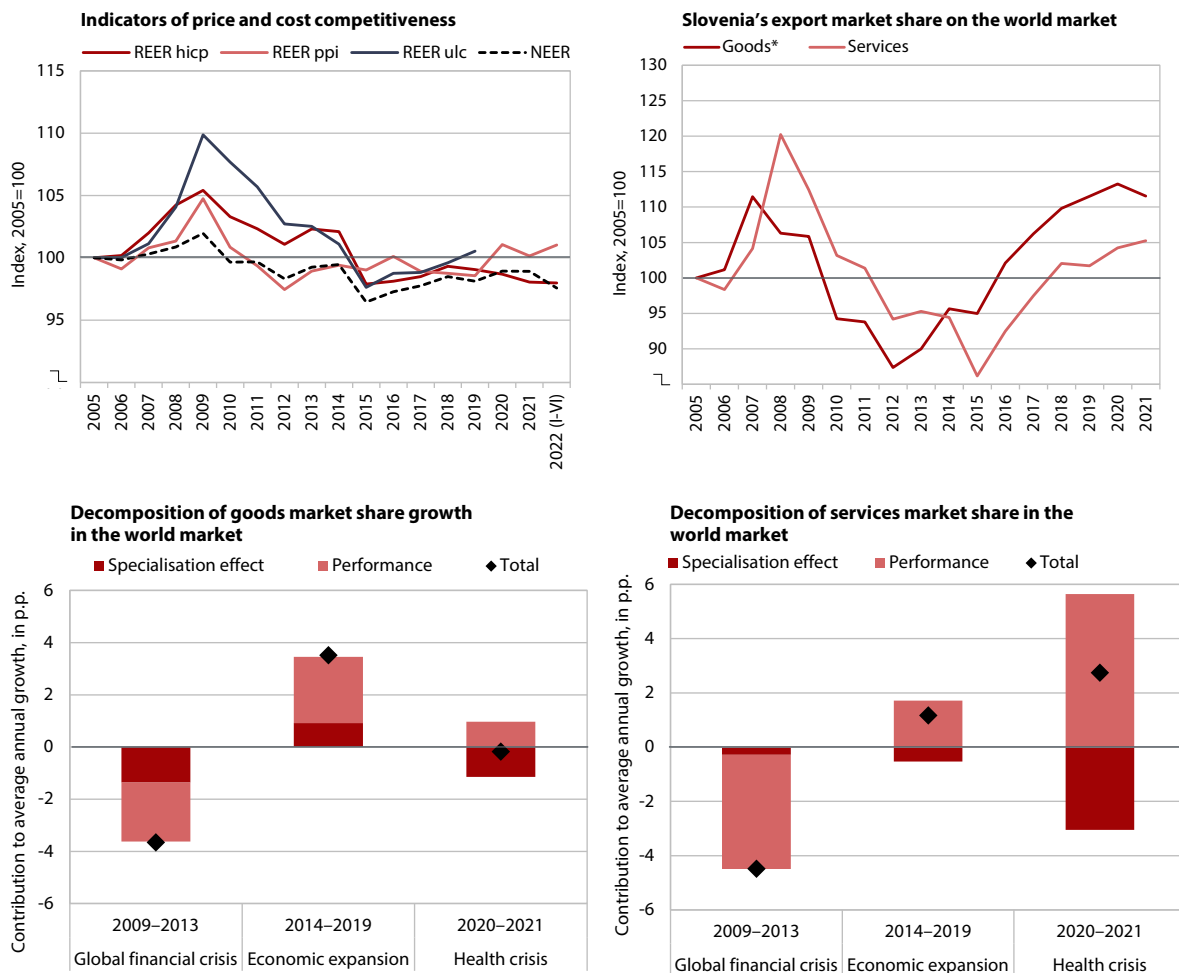
¹⁷ In 2010, wage growth was stimulated by the increase in the minimum wage following a significant rise in wage growth (in 2008) due to the adjustment of wages to high past inflation and productivity and the elimination of wage disparities in the public sector.

¹⁸ Greater cost pressures measured by unit labour costs (NULC) partly transferred to prices (PPI and HICP). Companies' profits and return on sale also fell considerably in 2009–2013.

¹⁹ More pronounced than would have been the case if resulting only from the structural effect as a result of the above-average orientation of Slovenian exports to markets (production and geographical markets) that grew more slowly during the global financial crisis (see Figure 9).

²⁰ In particular in 2020, wage growth was mostly supported by subsidies under anti-corona packages. This means that it did not burden employers, and we assess that the statistical indicator of unit labour costs (ULC) greatly overestimated the actual cost pressures and their negative impact on business results. As measures to maintain jobs and incomes varied among countries, in both scale and target, the comparison of statistical indicators that are not adjusted for budget expenditure does not reflect well the changes in the cost-competitive position of

Figure 9: In 2021, the multi-year growth in the export share on the global goods market came to a halt, while the services share continues to rise



Source: ECB (2022), UN Comtrade (2022), UNCTAD (2022), WTO (2022); calculations by IMAD. Notes: REER HICP (PPI, ULC): Real effective exchange rate in relation to 37 partners within and outside the euro area (weighted according to the relevance to Slovenia's foreign trade), deflated by the harmonised index of consumer prices (HICP), producer price index (PPI) or nominal unit labour costs (ULC). NEER: Nominal effective exchange rate in relation to 37 partners within and outside the euro area (weighted according to the relevance to Slovenia's foreign trade). Slovenian export market share is calculated as the ratio between Slovenian exports and world exports or imports. Slovenian goods exports do not include the exports of pharmaceutical products to Switzerland, which are an approximation of the sharply increased exports of previously imported pharmaceutical products and do not reflect the change in the competitive position; their impact on economic activity is negligible and is not included in national accounts export data. Data for 2020 and 2021 are provisional. The decomposition of goods market share growth is based on nominal values (USD) of the 3-digit Standard International Trade Classification (SITC) and the service market share on the service classification BOP6. For more information on the decomposition methodology, see the Productivity Report (IMAD, 2019).

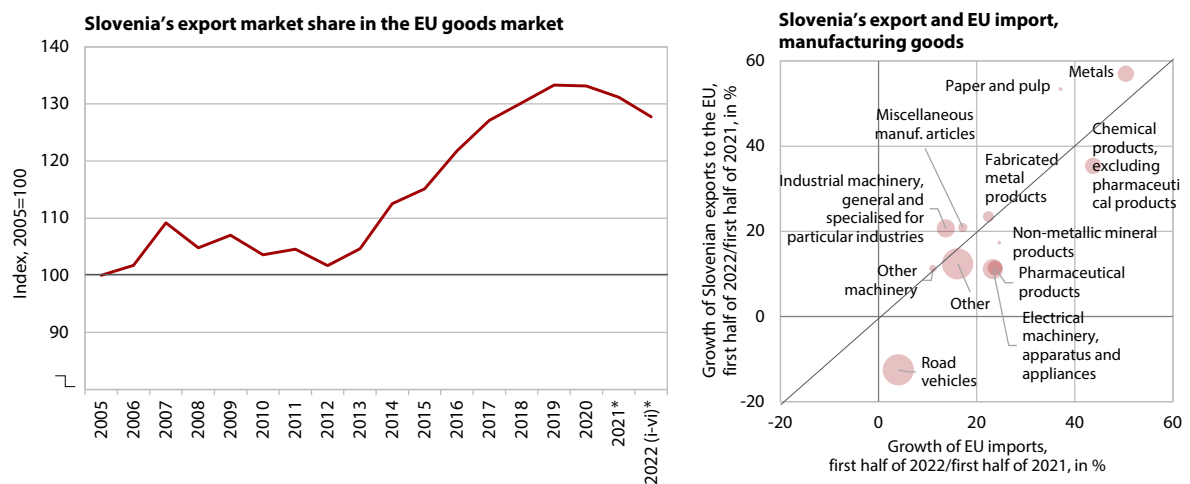
Assessments for the first half of 2022 indicate a further decline in Slovenian export share on the EU goods market. The export market share on the EU market, to which Slovenia exports roughly 70% of goods, started to fall in the second half of 2021. The major part of the deterioration on the EU market can still be explained by the orientation of Slovenian exports to currently slow-growing markets. In geographical terms, this is related primarily to the slowdown of import demand in the most important trade partner, i.e. Germany. In terms of production specialisation, the car industry²¹ has a strong negative impact, as it has been dealing with supply

exporters during the epidemic. See also IMAD (2022b) and IMAD (2022c).

²¹ As this is the group with the greatest share in the goods exports of Slovenia, which is also above average in comparison with average EU exports/imports, the slowdown of export/import flows of road vehicles affected Slovenian exports more than the average EU exports/imports.

chain disruptions since the start of the COVID-19 pandemic. In the first half-year, the imports of road vehicles of EU Member States increased slightly year-on-year but are, contrary to other goods, still near the pre-epidemic level. With the already low import demand, the Slovenian market share on the EU road vehicle market has fallen further.²² In 2021 and 2022, the product groups of electric machinery and devices and pharmaceutical products, which have the largest share in Slovenian goods exports to the EU apart from road vehicles, also recorded a decline in *performance*, measured by the reduction in the export market share of these particular product groups. On the other hand, among the larger groups, industrial machinery, metal products and certain energy-intensive products (paper and metals) maintained or even increased their market shares (compared to the pre-epidemic year and also the last year).²³

Figure 10: The fall in Slovenia's EU market share in the first half of 2022 is strongly related to unfavourable trends in the largest export groups – road vehicles, electric machinery and devices, and pharmaceutical products



Source: SURS (2022d), Eurostat (2022c). Notes: * Estimate; Slovenian EU goods market share is the ratio between Slovenian goods imports into the EU and total goods imports into the EU. The right figure only shows product groups in the manufacturing sector.

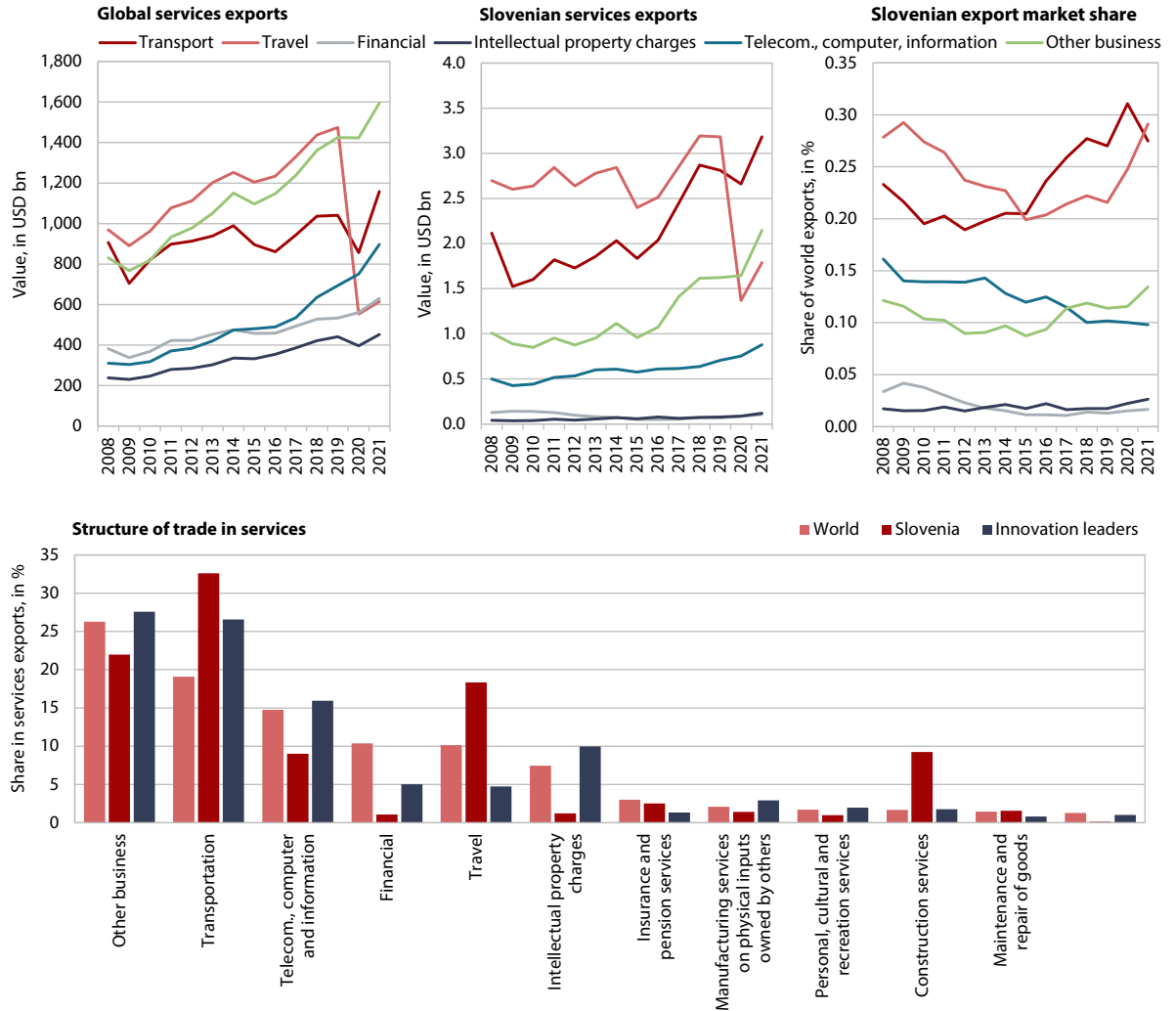
Slovenia has a relatively high export market share in traditional trade services (transport and travel) but poorly exploits the potential in knowledge-based services. Slovenian service exports are strongly based on travel and transport, partly due to its favourable geographical position. In 2021, these two groups together represented 60% of Slovenian service exports (30% of world service exports). During the COVID-19 pandemic, containment measures (and self-restrictive behaviour) more than halved the value of global trade in travel; in 2021, global trade expressed in dollars was lower by 58% than in 2019 (Slovenian exports by 44%). Following a steep decline in the first year of the pandemic, in 2021 the world exports of transport services exceeded the pre-pandemic level by 11% (Slovenian exports by 13%). ICT services and other business services, including research and development, professional and business consulting, and technical services related to trade, contributed the most to the growth in global service trade during the pandemic and also in 2008–2021. Slovenia exports relatively few of these services and, compared to 2008, the low share has further reduced in ICT services (by 40%), while in other

²² In the first half of 2022, Slovenian exports to the EU market fell by 13% year-on-year (EU: +4%) and were 23% (EU: -2%) lower than in 2019 (i–vi).

²³ In the first half-year, the export market share of all energy-intensive products remained at the level of the comparable period in 2021; the increase in paper and metal balanced the reduction in chemical and non-metallic mineral products. For more information on the competitiveness of energy-intensive products, see Section 4.2.1.

business services it has increased by 11%. In line with productivity trends, Slovenia is relatively successful in international service trade with regard to traditional trade services but less with regard to fast-growing knowledge-based services, which constitute an untapped potential and with regard to which the innovation leaders are achieving high export and market shares.

Figure 11: Slovenian service exports are strongly based on transport and travel, while the global service trade is driven primarily by knowledge-based services



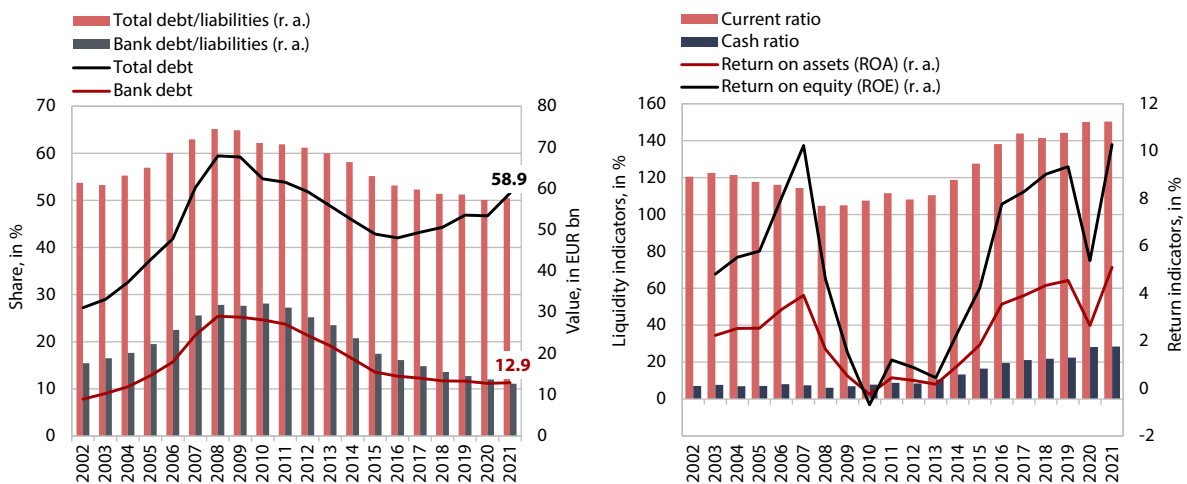
Source: WTO (2022); calculations by IMAD. Note: Innovation leaders: SE, FI, DK, BE, NL.

2.2

Financial performance of companies

In the second year of the COVID-19 epidemic (2021), when the measures to mitigate the consequences of the epidemic were gradually withdrawn and investments restarted, the indebtedness of companies increased slightly but the overall financial situation of the corporate sector remained relatively favourable. After the peak in the global financial crisis (2008–2009), the *indebtedness* of the corporate sector had reduced considerably and was still low before the onset of the COVID-19 epidemic, despite the gradual increase in the total and financial debt.²⁴ In 2020, it decreased under the impact of large-scale government measures to mitigate the consequences of the epidemic; in 2021, when the measures were gradually withdrawn and the investment cycle restarted,²⁵ it increased again. According to most indicators, the indebtedness was higher than before the epidemic but lower than at the beginning of the global financial crisis (Figure 12). *Over-indebtedness*,²⁶ which increased with the outbreak of the COVID-19 epidemic, in 2021 again reached the lowest levels since 2006 (Figure 13). The concentration of the net financial debt of over-indebted companies also decreased compared to 2019.²⁷ According to the majority of indicators, in 2021 the *ability of companies to repay their debts* improved further and reached the best values since 2006 (Figure 13).²⁸ This was due to a pronounced improvement of all *profitability* indicators, which in 2021 reached the highest values²⁹ since 2006. In 2020 and 2021, the *liquidity* of the corporate sector also improved slightly, with the majority of indicators reaching the best values since 2006 (Figure 12).

Figure 12: Indicators of indebtedness, liquidity and profitability are still favourable



Source: AJPES (n.d.-b); calculations by IMAD. Note: r. a. – right axis.

²⁴ Total debt comprises the financial (including bank), operational and other liabilities of companies. Financial debt comparisons can be made as of 2006 (when 2006 Slovenian Accounting Standards were introduced).

²⁵ Some support measures were in force until September 2021 and could still positively affect the operations of companies (liquidity and profitability). As the situation became more stable, which reduced economic uncertainty, companies also became more inclined to invest.

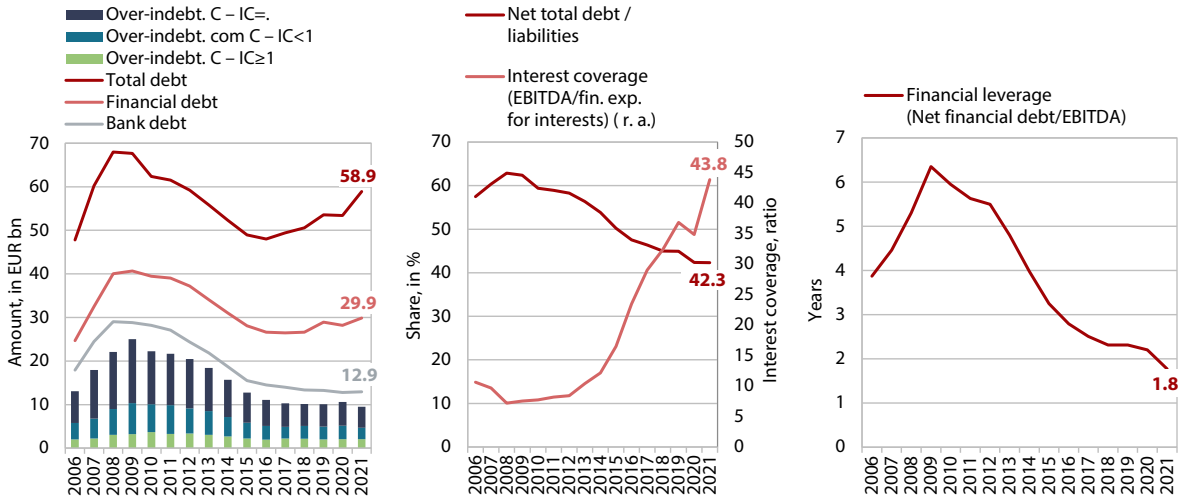
²⁶ Over-indebtedness is calculated as the sum of net financial debts (i.e. financial debt excluding cash), exceeding EBITDA by a factor of five (if $FL \geq 5$) or as the sum of the overall net financial debt (if $EBITDA < 0$). EBITDA is free cash-flow from operating activities (earnings before interest, taxes, depreciation and amortisation). FL – financial leverage (i.e. net financial debt/EBITDA).

²⁷ Ten of the most indebted companies had roughly 20% (23% in 2019) and 50 had almost 37% (42% in 2019) of the net financial debt of all over-indebted companies.

²⁸ Before the epidemic, the ability to repay debts had initially been improving mainly due to deleveraging and later mostly due to the improving business results.

²⁹ In 2021, the net profit of companies doubled and EBITDA increased by more than a quarter, added value by almost a fifth and capital by almost a tenth.

Figure 13: The ability to repay debts further improved during the COVID-19 epidemic according to most indicators, while over-indebtedness is at the lowest level since 2006



Source: AJPES (n.d.-b); calculations by IMAD. Note: Over-indebt. – over-indebtedness; C – IC – companies with interest coverage (EBITDA/interest); IC = . – companies with zero financial expenditure on interest; r.a. – right axis.

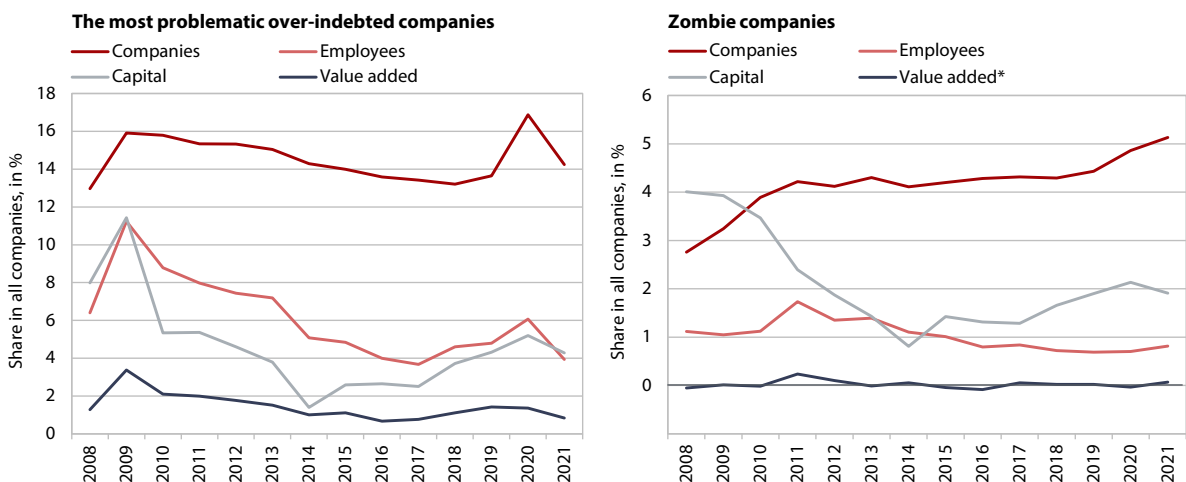
Though the overall financial situation of the corporate sector was relatively favourable, in certain segments of the economy the financial situation worsened considerably in 2020 and 2021... During the COVID-19 epidemic, bank debt increased in administrative and support service activities, accommodation and food service activities, construction, ICT activities, and the energy industry (see Appendix, Figure 1).³⁰ In 2020–2021, the ability to repay debts, measured as financial leverage, also deteriorated in some segments of the economy (see Appendix, Figure 1), in 2020 in particular in some market services most affected by the COVID-19 epidemic (accommodation and food service activities, arts and recreation), and in 2021 in activities of holding and leasing companies (where it was still the worst, around 39 years).³¹ In 2020–2021, over-indebtedness increased in half of activities (administrative and support service activities, accommodation and food service activities, construction, other activities, arts and recreation, professional and technical activities, and ICT activities), although in 2021 it reached the lowest overall value since 2006 (EUR 9.5 billion – see Figure 13; for a breakdown by activities, see Appendix, Figure 1).³²

... which has led to an increase in the share of companies with relatively high exposure to insolvency risk, which in 2021, according to all indicators, was already lower than in the period of the global financial crisis. The most problematic over-indebted companies are those that have net financial debt and negative EBITDA. They include zombie companies, which are at the highest risk of insolvency, as, in addition to net financial debt, they had negative EBITDA for at least three consecutive years. In 2021, 14.2% (against 13.7% in the period of economic growth (2014–2019)) of companies were the most problematic over-indebted companies. They generated 0.8% (1%) of value added generated by all companies, employed 3.9% (4.5%) of all employees and had 4.3% (2.9%) of total capital in their annual accounts.³³ In the first

³⁰ Only in the last year (2021) did bank debt also increase in real estate activities and manufacturing.
³¹ In 2021, financial solvency also declined slightly in construction, which has suffered cost pressures since the second half of 2021 due to the worsening of conditions on the raw material markets.
³² In 2021, over-indebtedness only increased in ICT activities, construction, activities of holding and leasing companies, and real estate activities.
³³ In 2021, the number of companies with the highest probability of insolvency (so-called zombie companies) was

year of the epidemic, the majority of these percentages temporarily increased, while in 2021 every one of them fell below the level of the global financial crisis (2008–2013). The shares of the total number of companies and capital are still higher than before the COVID-19 epidemic and in the period of economic growth (2014–2019; see Figure 14). In 2008–2021, the productivity of the most problematic over-indebted companies was lower than in the entire corporate sector by more than three-quarters (see Appendix, Figure 2). In 2021, 49.4% of over-indebtedness (EUR 4.7 billion; 40.1% in 2014–2019)³⁴ was concentrated in these companies, the majority (almost 94%) in SMEs.³⁵ By activity, more than 30% of the total over-indebtedness of these companies was concentrated in holding and leasing companies and more than 10% in companies engaged in professional and technical activities.³⁶ In addition, over-indebtedness also markedly increased in accommodation and food service activities³⁷ and construction³⁸ during the epidemic (see Appendix, Figure 3). The bank debt of the most problematic over-indebted companies amounted to 5.2% of total bank debt (10% in 2014–2019) and was the lowest since 2008.³⁹

Figure 14: In 2020 and 2021, the share of companies with relatively high exposure to insolvency risk increased but is still lower than during the global financial crisis



Source: AJPES (n.d.-b); calculations by IMAD. Notes: Employees – the average number of employees based on working hours (AOP 188); Value added*: gross operating yield (AOP 126) – subsidies, grants, annual leave payments, compensations and other revenue related to business effects (AOP 124) – costs of goods, materials and services (AOP 128) – other operating expenses (AOP 148), was slightly negative in 2008, 2015, 2016 and 2020.

the greatest since 2008 (5.1%; in 2008–2013 there were 3.8% such companies). They employed 0.8% (1.3%) of all employees, had 1.9% (2.8%) of capital and generated 0.07% (0.04%) of value added generated by all companies.

³⁴ In 2021, the over-indebtedness of zombie companies amounted to EUR 2.7 billion and accounted for 28.3% of total over-indebtedness (2008–2013: 16.3%). It was still 12.2% higher than in 2019.

³⁵ Within which its share increased in small and medium-sized enterprises and fell in large enterprises.

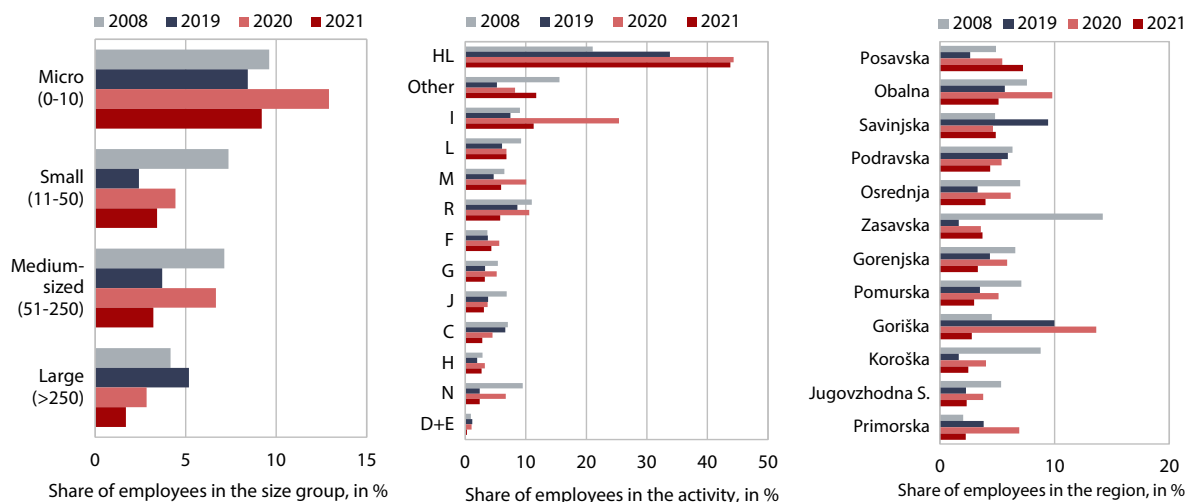
³⁶ Among these, companies engaged in activities of head offices (SKD2: 70) predominate in terms of both the number of companies and the number of employees.

³⁷ Among these, companies engaged in food and beverage service activities (SKD2: 56) predominate in terms of the number of companies, the number of employees and the contribution to added value. Indebtedness and over-indebtedness are higher in accommodation activities (SKD2: 55), which contribute roughly two-thirds of the bank debt and over-indebtedness within the accommodation and food service activities. In addition to relatively high exposure to insolvency risk in terms of indebtedness, the companies in accommodation activities are also exposed to above-average cost pressures due to high prices of energy products (see also Section 4.2.1).

³⁸ In 2021, these companies also dealt with very high cost pressures due to the cost of raw materials (civil engineering and specialised construction activities).

³⁹ In 2008–2013, the share of bank debt was almost three times higher (15.1%). The total debt of the most problematic over-indebted companies accounted for 11.4% (12.6% in 2014–2019) of the total, while the financial debt accounted for 16.7% (17.2%) of total financial debt. In zombie companies it amounted to 1.6% of total bank debt or EUR 209 million, which was the lowest level since 2008 (2008–2013: 7.2%). Their total debt accounted for 5.6% (6.9%) of the total, while their financial debt accounted for 9.4% (9.4%) of total financial debt.

Figure 15: In 2021, the share of employees in companies with relatively high exposure to insolvency risk was the highest in SMEs, with regard to activity in holding and leasing activities and accommodation and food service activities, and with regard to regions in the Posavska, Obalno-kraška and Savinjska regions



Source: AJPES (n.d.-b); calculations by IMAD. Note: OTHER – A, B, part of K, O–Q, S, T; Obalna – Obalno-kraška; Osrednja – Osrednjeslovenska; Primorska – Primorsko-notranjska; Jugovzhodna S. – Jugovzhodna Slovenija; for the number of employees in the companies with relatively high exposure to insolvency risk by size, activity and region, see Appendix, Figure 4; for the share of companies with relatively high exposure to insolvency risk by size, activity and region, see Appendix, Figure 5.

Despite the increase in the share of companies that were relatively highly exposed to insolvency risk during the epidemic, the solvency of the corporate sector has not deteriorated as of mid-2022. This was to a large part due to the many government intervention measures to mitigate the consequences of the epidemic, as well as to overall financial stability and still favourable business results. *The assets quality of bank loans to companies* measured by the share of non-performing exposures (NPEs) has also improved during the epidemic and after the expiry of moratoria on loan repayments (August 2022: 1.8%),⁴⁰ although with different trends with regard to company size and activity. Only accommodation and food service activities stand out with regard to NPE increase, as they were the most affected by the measures taken to prevent the spread of infections. In August 2022, the NPE share of these activities reached 13.8% (it was 8.1% at the start of the epidemic).^{41, 42} The share of NPEs in SMEs (3.1%) continues to gradually decrease, while the share of NPEs in large companies has remained at levels below one percent.⁴³ Exposures to claims that are grouped for the purpose of credit loss assessment indicate a slightly *increased credit risk*. In August 2022, despite the gradual decrease, *the share of claims against companies whose credit risk has increased significantly since their loans were*

⁴⁰ The quality of claims for which deferrals were granted during the epidemic has been deteriorating according to several indicators (NPE share, assets with an increased credit risk (S2), restructured claims). The share of NPEs in deferred claims against companies increased to June 2022 and reached 9% (BoS, 2022e). The following stand out among the activities with greater deterioration of deferred claims: accommodation and food service activities (about 21%), professional and other business services (about 19%), and construction (more than 25%). The relevance of deferrals of credit obligations diminishes with the start of their repayment. Deferrals granted under the intervention act have all expired, and only a small part of bilaterally agreed deferrals remain active (the majority are in accommodation and food service activities (BoS, 2022f and 2022a)).

⁴¹ "The containment measures hit the accommodation sector particularly hard (SKD2: 55): by April its NPE ratio had more than doubled from the pre-epidemic level to reach 15.3%. Food and beverage service activities (SKD2: 56) partly adapted to the new conditions, which limited the inflow of new defaults at banks and maintained the NPE ratio in this segment close to its pre-epidemic level at 10.7%" (BoS, 2022a).

⁴² The rate of transition from payers to non-payers confirms the deterioration of the accommodation and food service activities portfolio in 2021 (average: 1%; accommodation and food service activities: 5% (BoS, 2022e)).

⁴³ At the start of the war in Ukraine in 2022, the foreign NPEs also increased slightly due to the claims against customers in the countries affected by the war and the sanctions (Russia, Belarus and Ukraine), although they are still relatively small (June 2022: EUR 78 million (BoS, 2022f)).

granted (S2) was still considerably higher (9.1%) than before the epidemic (6.5%), primarily due to the still high shares of accommodation and food service activities and arts and recreation (38% and 31% respectively; see Appendix, Figure 6), which were more affected during the epidemic.⁴⁴

The number of bankruptcy proceedings initiated against legal entities and sole proprietors since the beginning of the epidemic has been lower than in 2019. The number of bankruptcies initiated against companies in 2020 and 2021 decreased by 11% (9%) compared to the previous year, while the number of bankruptcies against sole proprietors decreased by 27% (17%). This is partly related to moratoria on bankruptcies, the closure of courts during the epidemic and moratoria on debt service. The reduction in the number of initiated bankruptcy proceedings against companies is also shown in the comparison between the first nine months of 2022 and the first nine months of 2021, while, after a significant prior reduction, the number of proceedings initiated against sole proprietors increased by 19% (see Appendix, Figure 7). In the first nine months of 2022, the greatest numbers of initiated bankruptcy proceedings against companies were in trade, construction, professional and technical activities, and transportation and against sole proprietors in construction, trade, and accommodation and food service activities (see Appendix, Figures 8 and 9). Even before the epidemic, these activities stood out in terms of the number of initiated bankruptcy proceedings.

With the support of many intervention measures,⁴⁵ the Slovenian corporate sector weathered the crisis caused by the COVID-19 epidemic fairly well, but already in 2022, the war in Ukraine and the emergency situation on the energy market confronted it with new challenges,⁴⁶ which require an appropriate economic policy response. If the current crisis resulted in a significant reduction in the scale of operations and no measures were taken, this would adversely affect the indicators of indebtedness, liquidity and profitability, and thus solvency and the rise in outstanding liabilities, which could lead to an increase in the number of bankruptcies. By the end of October 2022, the Government already adopted several measures to help the business sector and announced additional measures.⁴⁷ As far as possible, economic policy measures need to focus on supporting the healthy cores of the economy that are not over-indebted in the long term and are able to

⁴⁴ The share has been reducing in accommodation and food service activities since September 2021 and in arts and recreation since 2022.

⁴⁵ The closure of courts during the emergency declared due to COVID-19, systemic state measures, extensive state funds allocated to the corporate sector, and temporary amendments to the insolvency legislation that allowed companies a moratorium on bankruptcies and given them time to restructure.

⁴⁶ In particular in relation to cost pressures: (i) high inflation in combination with impeded access to raw materials and energy; (ii) increased financing of company stocks to ensure smooth operation due to continued disturbances in supply chains; (iii) increase in interest rates (variable rate loans predominate among companies; more than 70% (see Section 1.5 of BoS (2022e)).

⁴⁷ The first set of measures: 1. Three types of non-refundable aid to the business sector in the form of the co-financing of electricity and natural gas costs above the twofold increase in prices (under the ZPGVCEP (2022); the amount: EUR 80 million): (i) basic aid (for SMEs), (ii) special aid (for large companies) and (iii) aid for energy-intensive companies (see SPIRIT Slovenia, 2022); 2. Crisis liquidity loans for financing operating current assets in the amount of EUR 20,000–100,000 (for SMEs in manufacturing, accommodation and food service activities, cultural activities, and road transport activities; the amount in 2022: EUR 32 million; in 2023 under the ZPGVCEP: EUR 6 million; see SPS (2022)); 3. Guarantees for energy companies (HSE, GEN, GEN-I and GEOPLIN; in the amount of 80% of the obligations) for a reliable access to short-term operating liquidity (see ZPKKEKP, 2022); 4. Liquidity loans above EUR 100,000 for operating current assets and investments of companies that found themselves in difficulties due to the consequences of Russia's aggression against Ukraine (see SID Bank, 2022); 5. Aid for farmers and fishers (amount: EUR 22.3 million): (i) in the dairy sector, (ii) for engine fuel and (iii) for intermediate goods (see MKGP, 2022)); 6. The following also contributes to alleviating the pressures on the corporate sector: (i) regulating petroleum product prices, (ii) reducing VAT on energy products (to 9.5% from September 2022 to May 2023; ZNUDDVE (2022)), (iii) maintaining the reduced 50% excise duty on energy products and electricity, and (iv) laying down the minimum allowed retail price of gas for small business consumers (from September 2022 to August 2023; see various decrees (2022; 2022)).

survive in the long run, especially on the development-oriented niche segments of the economy with high growth potential.⁴⁸ Facilitating the funding and thus the preservation of zombie companies (i.e. the unhealthy cores of the economy)⁴⁹ prevents the optimal allocation of production resources to more productive companies and, as a result, hinders both productivity and economic growth.⁵⁰ The production resources of companies with relatively high exposure to insolvency risk would not necessarily be lost in the event of proper restructuring of over-indebted companies, also taking into account the general labour shortage.

2.3

The changed global economic context

Globalisation⁵¹ has had an important impact on global economic integration by increasing the integration of companies and countries in global value chains and thus expanding global trade and cross-border capital movement.

The global value chains (GVCs) were effective primarily in managing the costs and optimising production. This enabled the fragmentation of production and business processes and the specialisation into separate stages, functions and tasks, which optimised the processes at different locations and increased international trade. Foreign direct investments have always been an important factor in increasing participation in GVCs and are usually related to investments in production (increasing backward GVC participation) (Cigna et al., 2022). It should be noted that added value is higher in the activities (or companies or countries) that are at the beginning (e.g. research and development) and the end (e.g. marketing and sales) of a value chain and are linked to intangible functions and services and lower in the activities that focus on the production and assembly of parts (Stare, 2016).⁵² The development and application of information and communication technologies, the integration of goods and services production, and the reduction in transport costs intensified the process of GVC build-up and the changes in international trade (Fernandes et al., 2020). Institutional factors, such as free trade agreements and reduced customs duties and other trade barriers, also significantly contributed to the process. The liberalisation of international financial and capital flows promoted greater foreign direct investments and the transfer of technological innovations and knowledge (IMF Staff, 2008).

Although it has its advantages, globalisation also brings challenges which affect individual countries, regions and the functioning of GVCs in different ways. This is primarily related to geopolitics and the politicisation of trade negotiations, increasing inequalities, labour exploitation, migrations and

⁴⁸ For a better insight into the possibilities of economic policy in this area, see also Demmou et al. (2021) and Diez et al. (2021).

⁴⁹ In 2021, zombie companies received 0.8% (EUR 8.4 million) and the most problematic over-indebted companies 5.4% (EUR 56.5 million) of all subsidies granted to the corporate sector.

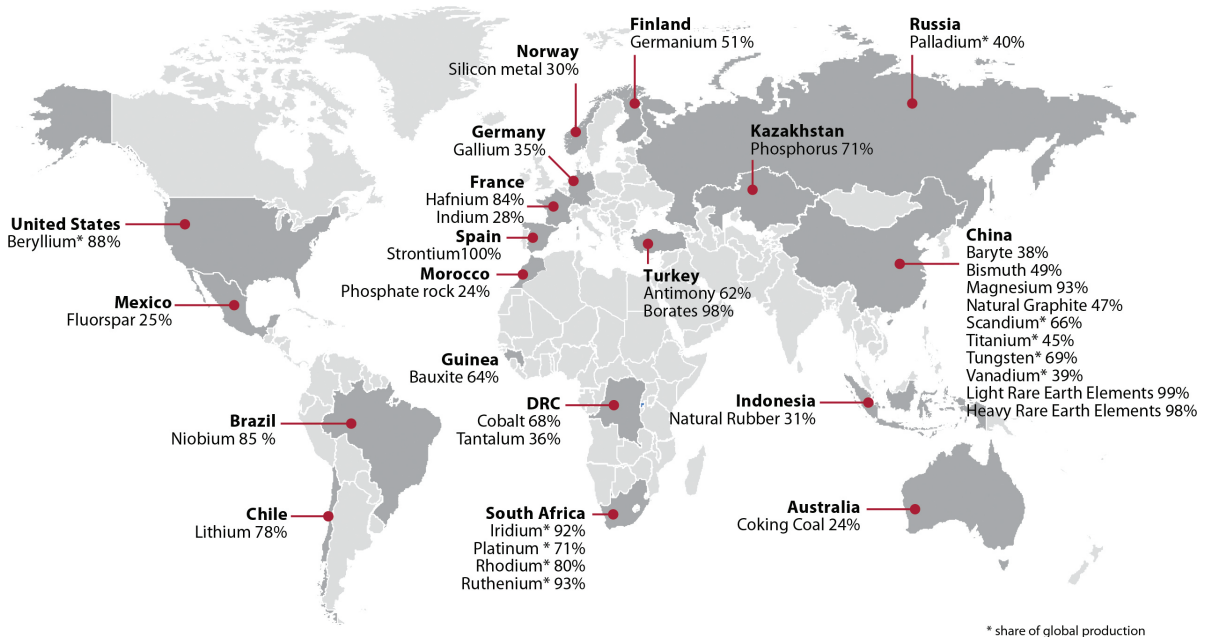
⁵⁰ The COVID-19 epidemic, which affected both low- and high-productivity companies, and the wide scope of the measures to mitigate its consequences slowed the optimal reallocation of production resources from the low-productivity to the high-productivity companies (the cleansing effect). It is expected that the phasing-out of measures will enable these mechanisms to return to their optimal function (EC, 2022I). With regard to the small cleansing effect and the impact of job preservation schemes on the allocation efficiency in Slovenia in 2020, see also Bighelli et al., 2022, Section 5.1; IMAD, 2022c, Box 3.

⁵¹ Globalisation is reflected in the increase in the cross-border movement of goods, services, money, people, information and culture. It also has an important impact on the development and functioning of society, politics and economic systems, which is also a result of trade and cultural exchanges at the global level. Definitions of globalisation in various literature differ considerably and are very wide (IMF Staff, 2008); hereafter we will refer primarily to economic globalisation.

⁵² The conceptual model with the stylised "smiling curve" illustrating the stages in which added value is generated. The curve was conceived by Stan Shih, then the executive director of Acer, based on the company's experience (Mudambi, 2008; Ye et al., 2015).

environmental pollution (Global Agenda Council, 2015). With development, the geographical and sectoral GVC concentration have also increased, but above all, the role of China and other Asian countries has increased in the production-related activities (Jiménez et al., 2022). During emergency situations and events (e.g. the COVID-19 pandemic, wars and natural disasters), high geographical concentration of GVC segments can entail great risks for international business operation which are related to exposure to the suppliers of critical raw materials or countries with dominant position in particular GVC segments. It should be noted that in the EU, the supply of critical products and raw materials⁵³, which are crucial for the smooth functioning of industry and are mostly related to modern technologies and green transition, is highly concentrated in a few countries and regions (EC, 2022c).

Figure 16: The supply of critical products and raw materials in the EU is highly concentrated in a few countries



Source: European Commission (2022c). Note: The share indicated is the share of product supply to EU Member States, except for the products marked with an asterisk (*), for which the share in global production is indicated.

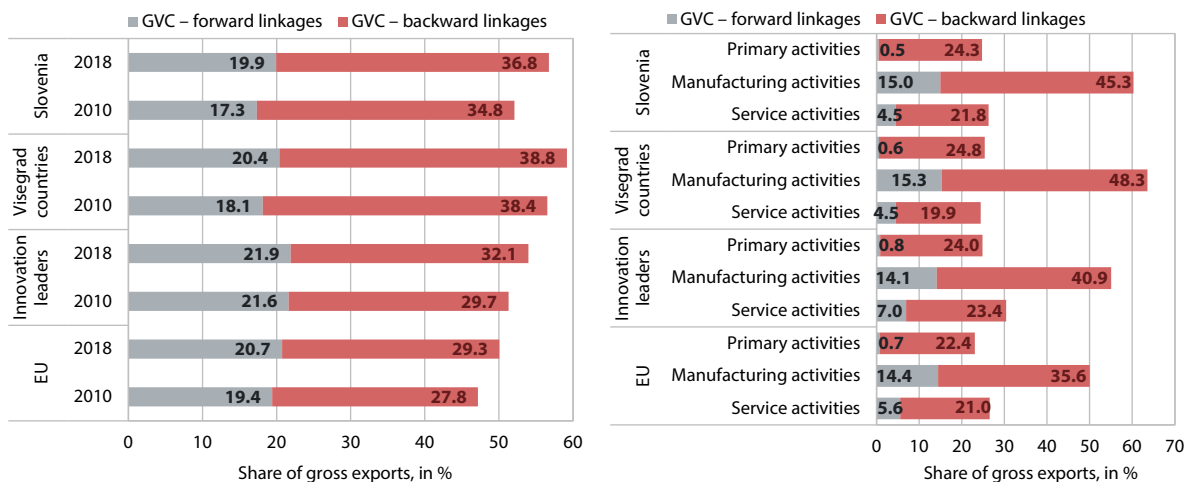
Due to the push for deglobalisation, the trend of GVC build-up and expansion has been turning in recent years. Interconnected phenomena and changed conditions in the international environment have a significant impact on GVCs, in particular the changed national politics⁵⁴ and greater push for deglobalisation (Pisani-Ferry, 2021), the increase in protectionism, the trade war between USA and China (García-Herrero and Tan, 2020), the COVID-19 pandemic (AHK, 2021b; Fontaine, 2020), and the geopolitical situation related to the war in Ukraine (Winkler et al., 2022). The transition to the fourth industrial revolution is also causing changes in global chains (see IMAD, 2020). Development, services and physical production are increasingly intertwined, changing the process of globalisation and GVCs, as new solutions are tested and established more rapidly due to competition pressures and advanced technologies (Stare, 2016).

⁵³ The EU list currently contains 30 critical products and raw materials (EC, 2022c). Stocks of 11 critical products are also available in the EU, but for economic (e.g. stock volume and labour price) and environmental reasons, some products are not used or are used to a smaller extent (EC, 2022m; Reisch, 2022).

⁵⁴ The election of Donald Trump as US President and "America First" policy, the exit of the UK from the EU, protests and the yellow vest movement in France, etc.

As a small open economy, Slovenia is strongly integrated in GVCs; however, Slovenian added value embodied in foreign exports as a share of domestic exports is lower than the average in the EU, the innovation leaders and the Visegrad countries. Compared to the average in the EU and the innovation leaders, Slovenia has a higher value of the GVC participation indicator,⁵⁵ mostly due to a high share of foreign value added in exports (backward GVC participation), which in 2010–2018 increased more than the average in the EU and the Visegrad countries but less than the average in the innovation leaders. In Slovenia, as in those three country groups, backward GVC participation is particularly high in industry but less in the service activities. In turn, Slovenian service activities have slightly higher backward GVC participation than the average in the EU and the Visegrad countries and lower backward GVC participation than in the innovation leaders. The forward GVC participation, or Slovenian added value embodied in foreign exports as a share of domestic exports, is lower than the EU, the innovation leaders and the Visegrad group average, which is attributed, in particular, to the lower participation of (especially knowledge-based) service activities⁵⁶ (except compared to the Visegrad countries, where there is a lower participation of manufacturing activities) and, in terms of added value, to less favourable functions that Slovenian companies perform within GVCs in other activities. In part, this is also a result of the small domestic market, which increases the import component of exports. Slovenia generates significantly more value added in exports per capita than Visegrad countries but considerably less than the innovation leaders.

Figure 17: The participation of the Slovenian business sector in GVCs increased in 2010–2018 (left); Slovenian manufacturing activities are more integrated in GVCs than is the average in the EU and the innovation leaders but less than the Visegrad group average (right)



Source: OECD (2021h); calculations by IMAD.

⁵⁵ The GVC participation index, expressed in percent of gross exports. Backward GVC participation is the ratio between the volume of foreign added value in domestic exports and gross exports, while forward GVC participation is the ratio between the volume of domestic added value in foreign exports and gross exports.

⁵⁶ Baldwin (2022) considers that the future of globalisation and changing GVCs is in the trade in services not goods. The expansion of service trade has been facilitated primarily by digitalisation, which was accelerated by the COVID-19 pandemic. In addition, the developed countries have not yet established serious trade barriers to intermediate services.

In the last two years, various factors in demand and supply have accelerated the changes in GVCs and affected the disruptions and bottlenecks in supply chains. The global supply chain pressure index (GSCPI) shows that severe disruptions in supply chains first occurred in the beginning of 2020 and, with the rapid recovery of demand, had reached record levels by the end of 2021. The COVID-19 pandemic affected the limitations in the functioning of industry and exposed the problems in logistic chains and services (e.g. increasing transport costs and the limitations of cargo shipping). Demand structure also started to change gradually, which is also due to digitalisation and green transition. After the initial shock at the onset of the epidemic, the rapid recovery of global consumption and increased demand for certain raw materials and supplies were confronted with limited supply (e.g. of non-energy industrial raw materials and semiconductors) and interrupted or hindered supply routes. In addition to the increasing labour shortage and the zero COVID-19 strategy in China, the shortage of raw materials and intermediate products had a significant impact on industrial production, which at the end of 2021 also faced a rapid rise in energy product prices (Benoit et al., 2022; Cigna et al., 2022). At the end of February 2022, Russia's attack on Ukraine caused another shock to manufacturing chains, which was mostly related to the supply of energy products. Pressures on supply chains (GSPCI value) have reduced in the last months, which was mostly due to the cooling of the global economy. Direct exposure of the Slovenian economy to Russia and Ukraine through GVCs is relatively small (IMAD, 2022a); most significant is the high dependency on the import of energy products (see Section 4.2.1).

Figure 18: With the cooling of the global economy, the GSCPI has been falling in the last months, although it remains above the long-term average (left); companies in the EU and Slovenia still report that material shortages are significantly limiting their production (right)



Source: Federal Reserve Bank of New York (2022); Eurostat (2022a). Note: The long-term average for GSCPI is calculated over the 1997–2022 period.

As a result of increased protectionism globally and difficulties in supply chains, a debate opened in the EU on reshoring production or part of production to Europe.⁵⁷ In the current situation, the strategic autonomy of Europe is also being questioned (Raza et al., 2021). To a limited extent, some segments of production processes had been moved closer to home countries before the COVID-19 pandemic, mostly due to the reducing cost advantages of developing countries, the underestimation of the total cost of moving production abroad, and the need to

⁵⁷ Moving production or segments thereof to the home country (reshoring), near the home country (nearshoring) or to friendly countries (friendshoring).

have production closer to the market and development activities (De Backer et al., 2016; IMAD, 2020), while similar trends are also driven by the transition to the fourth industrial revolution. During the pandemic, it became clear that due to the length and complexity of GVCs, in the event of negative shocks, companies are exposed to high supply risks. In this context, reshoring production to Europe would play a double role: increasing the security of supply and increasing Europe's strategic independence with regard to critical and high-technology products, which would potentially reduce the risks related to transport and shorten delivery times. Such transformation of GVCs is an opportunity for the Central and Eastern European countries, which are more cost-competitive than the older EU Member States (Kolev and Obst, 2022). However, the efficiency of reshoring production to Europe could be questionable in terms of supply security. Just like foreign production, domestic production could also be effected by an outside shock and it would still depend on the import of raw materials (Baldwin and Evenett, n.d.). Some studies (e.g. Caselli et al., 2015; OECD, 2021a) show that participation in GVCs or openness to foreign trade can mitigate the consequences of shocks in some cases. Furthermore, reshoring production to Europe could reduce the cost-effectiveness of production. Many studies have also shown that the loss of well-being due to the disruption of GVCs would considerably outbalance the positive effects of supply security (Eppinger et al., 2021; Kolev and Obst, 2022).

Data on production reshoring and nearshoring are still very limited and mostly based on surveys among companies. The McKinsey study (Alicke et al., 2021) shows that when GVC disruptions started at the onset of the epidemic, companies planned to increase the regionalisation and dispersion of supply chains (including the nearshoring of suppliers), but these mainly increased the stocks in the entire supply chain. This encouraged companies to move from the established *just-in-time*⁵⁸ concept to the *just-in-case*⁵⁹ concept, which was to ensure greater stability of production processes and stocks of products in sales during the COVID-19 epidemic. Larger stocks, in particular of critical products and raw materials, reduce the costs of supply chain disruptions in the event of shocks and also enable companies to respond to sudden rises in demand faster (Evans, 2020; Lund et al., 2020). Surveys among German companies in 2021 and 2022 showed that companies plan to further change their supply chains, while the majority wish to maintain their global orientation. In addition to the pandemic and the zero COVID-19 policy in China, the war in Ukraine and the resulting sanctions against Russia led to significant changes in the strategy of GVC participation, the assessment of risks in certain regions, and also the perception of the political environment in which companies operate (e.g. greater trade restrictions and protectionism) (AHK, 2022; Flach et al., 2021; Kolev and Obst, 2022). More than 80% of German companies and branches expect long-term changes in GVCs⁶⁰ related to the changing transport routes, the termination or limitation of business relationships in certain regions, and the diversification of the supply network⁶¹. This year, 22% of companies planned to reshore their production (15% according to the 2021 survey), and 16% planned to nearshore it (AHK, 2021a, 2022). On the other hand, the survey conducted by the Supply Chain Media and the

⁵⁸ The just-in-time concept is one of the most established ways of optimising production and reducing costs; it includes eliminating surplus stocks and ensuring uninterrupted process flows (supply of materials and production only when and in the quantities needed).

⁵⁹ The just-in-case concept is a business strategy that includes sufficient stocks in all stages of production and distribution (stocks of raw materials, components, work in process and finished products) and is particularly useful in times of uncertainty and shocks, when there are greater fluctuations in demand and supply. Its main disadvantage are high costs of stocks.

⁶⁰ Companies with head offices in China and in the euro area expect the greatest changes.

⁶¹ In 2021, there were only 11.3% of manufacturing companies that intended to strengthen the supply from other European countries and 12% through increasing the supply in the home country (Flach et al., 2021).

Buck Consultants (Wagenvoort, 2022) shows a considerably higher percentage of companies that plan to shorten their supply chains. Preliminary results of a survey among Slovenian companies (Palčič and Kovič, 2022) show that there have been no major changes in their GVCs or the geographical location of their production or branches in the last two years. Companies only report of the changes in the geographical structure of suppliers of input resources, primarily due to the war in Ukraine (34% of the companies have changed their suppliers). It has been noted that they usually seek suppliers nearer to the production (e.g. in the EU or nearby). As GVCs are changing, Slovenian businesspeople are more optimistic about the impact of reshoring on the economy than businesspeople in the EU in general (IMD, 2022a).

3 Key factors of productivity and competitiveness

The environment in which companies operate is changing at an accelerating pace. Particularly rapid is technological progress combined with digitalisation and increasing information processing capacity. Other global megatrends are also influencing business, in particular the green transformation of economies, which has been further boosted by the energy crisis. This is also causing widespread disruption and change in global value chains. All this requires highly responsive and flexible business entities and employees, along with a similarly supportive environment for companies to operate in. That is why the initial focus in this chapter is on the external business environment of companies, in particular the institutional framework and the tax system, and, among internal company productivity factors, additionally on the social capital of employees and the business agility of companies. This is followed by the traditional analysis of the key factors for the transition to innovation-led growth, which we see as the best response to the challenges of rapid change. In this section, we analyse the availability of human capital in the context of labour shortages and future skills needs. We show trends and investments in research and development, innovation, digital transformation, and entrepreneurship, with a particular focus on intangible factors. The chapter concludes with an overview of overall investment activity (of companies and the general government), which has both a direct and an indirect impact on labour productivity growth through increased capital deepening and innovation capacity building.

3.1 The business environment

The business environment in recent years has been characterised by uncertainty linked to the COVID-19 epidemic and a lack of stability in the international environment. The epidemic has had a major impact on economic conditions and increased uncertainty in the international environment⁶² over the past two years and, together with the heightened geopolitical situation, climate and demographic change, and digitalisation, has also had a significant impact on megatrends and thus on the global business environment (PMI, 2022). While the main advantages of the Slovenian business environment are its favourable geographical location and infrastructure connections and high-quality and well-qualified workforce, companies state that good staff are hard to find and keep (IMD, 2022a; Jaklič et al., 2018). The key weaknesses are mainly related to the institutional environment, which is not sufficiently efficient or business-friendly (bureaucracy, regulatory framework, tax system) (IMAD, 2022c).

While government efficiency has improved in some areas in recent years, tackling structural problems in the institutional environment, in particular related to de-bureaucratisation, remains a priority. An effective institutional framework is key to fostering an enabling business environment and supporting the functioning of companies, where Slovenia has made progress in recent years in several areas, notably related to changes in insolvency legislation, the efficiency of the judiciary, the modernisation of public procurement and the introduction of de-bureaucratisation⁶³, while the epidemic has accelerated the introduction of

⁶² Disruptions in supply chains with impact on production and globalisation, increased risks to financial stability, etc.

⁶³ In 2021, a new Debureaucratisation Act was adopted to increase the competitiveness of the business environment by reducing administrative barriers and introduce several simplifications of the existing legislation.

digital public services (IMAD, 2022c). Despite the adopted measures, international comparisons show that many other countries⁶⁴ have made greater and faster steps than Slovenia in changing regulations and reducing bureaucracy, this having an impact on the competitiveness of the business environment in Slovenia and the attractiveness for foreign investments in the international environment.⁶⁵

Government accountability and efficiency remain important challenges from a productivity perspective, in particular in supporting the operation of companies and in making the tax system simpler and more predictable. Slovenia ranks in the bottom half of EU Member States on most institutional performance indicators⁶⁶ and lags far behind the innovation leaders. The lag is biggest in voice and accountability indicators (transparency of policies, accountability of politicians and civil servants, state interference in business, etc.) and the government's effectiveness in supporting the functioning of companies (Kaufmann and Kraay, 2022). Confidence of companies in institutions, which further declined during the epidemic, is very low and among the lowest in the EU (IMD, 2022a; OECD, 2021c), which also has an impact on the business sector's assessments of the quality of institutions. Similarly, the results of international competitiveness surveys (IMD, 2022a; OECD, 2021c; WEF, 2019) point to structural weaknesses related to inefficient state administration and low institutional competitiveness, payroll taxes and contributions, and labour legislation (more in the Development Report 2022 (IMAD, 2022c)). In Slovenia, the complexity of the tax system (WEF, 2019), especially the number of payments and time to comply with tax obligations (World Bank, 2020), and the frequent changes in tax legislation and tax rates are also a barrier to the ease of doing business.

Given the tax changes to date, which have led to the lowest ever tax revenues as a percentage of GDP, and the structural challenges, further reductions in tax burdens would be difficult to achieve and shortfalls will need to be compensated by tax restructuring. As a percentage of GDP, Slovenia's tax and social contribution revenues are already lower than the EU average, and the gap has widened since 2010. The difference comes from lower taxes (especially on capital and wealth), while social contribution revenues have been higher in Slovenia than in the EU over the whole period. Tax reforms in Slovenia have so far mostly been carried out in a way that has not been fiscally neutral, as they were mostly about income tax reliefs. Such measures have also been aimed at boosting competitiveness, but on the other hand this has raised the question of the sustainability of other socio-economic systems, which are also important for competitiveness. At the same time, low public revenue expectations are also difficult to reconcile with current and future structural challenges (health, climate, energy, food crisis or demographic change), which are not only becoming more complex, but are even increasing the need for public investment, at least in the medium term. In various analyses for Slovenia, which in recent years have focused mainly on the potential of tax changes in terms

The mechanisms introduced should also prevent the accumulation of existing regulations and allow for the expiry of past (outdated) acts and regulations.

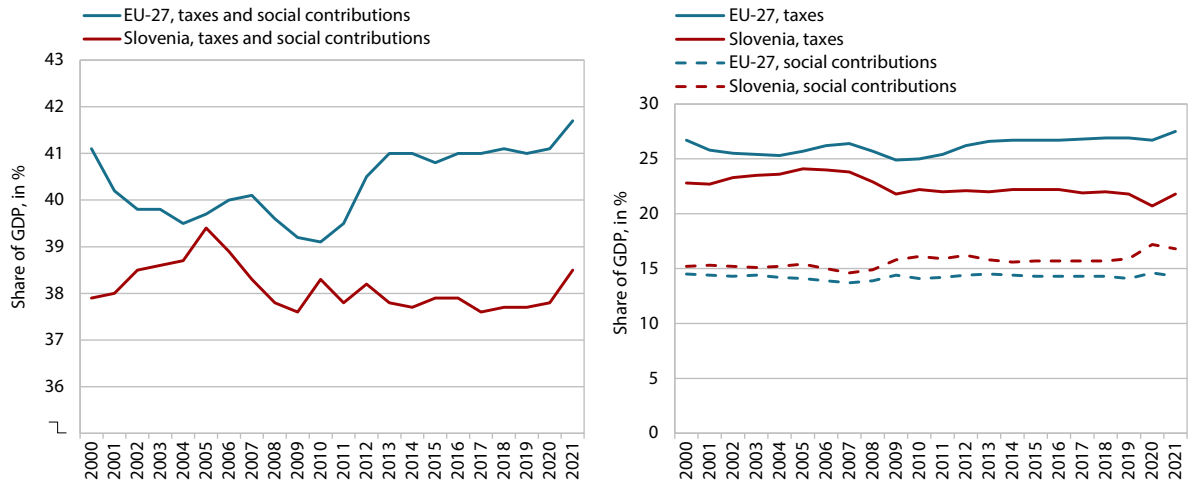
⁶⁴ Measures to support the operation of existing companies in the green transition (Denmark, Ireland, Netherlands, Greece); to encourage foreign direct investment (Latvia), to improve regulation (Portugal), to support SMEs (Cyprus), etc. (BusinessEurope, 2022; EC, 2020a, 2022a).

⁶⁵ Slovenia is among the EU Member States with the lowest share of inward FDI in GDP, despite growth in recent years (33.5% of GDP in 2021, lower than in the new EU Member States) (BoS, 2022c; UNCTAD, 2022). Economists rate investment incentives for foreign investors as very low compared to other EU Member States (IMD, 2022a).

⁶⁶ The World Bank's Quality of Governance Indicators, consisting of various sources and indicators, are the most commonly used in the literature. These indicators are voice and accountability (political processes, rights and media freedom), political stability and absence of violence/terrorism (stability and speed of change of government, security), regulatory quality, government effectiveness (functioning, efficiency, independence of the civil service, including the functioning of basic healthcare, education and infrastructure), rule of law (area of normative legal rules, respect for fundamental rights of the individual, independence and efficiency of the judiciary), and control of corruption.

of increasing labour supply and boosting long-term economic growth, the OECD, IMF and EC (EC, 2020b; IMF, 2019; OECD, 2018a) have proposed tax restructuring by reducing the burden of social security contributions on employees, with the shortfall in revenues to be covered by broadening the tax base, increasing less distortionary taxes (consumption taxes) and introducing a property tax. Taxes and some other levies on energy products are also at reduced levels in 2022 to mitigate the energy crisis, and recent analyses for Slovenia in particular point to the potential to increase these revenues in the context of meeting environmental targets (EC, 2022a; OECD, 2022b).

Figure 19: As a percentage of GDP, Slovenia’s tax and social contribution revenues are lower than the EU average (left), and the gap has widened since 2010, resulting from lowering the tax revenue share in Slovenia (right)



Source: Eurostat (2022c).

Box 1

Tax burdens in Slovenia

Total tax and social contribution revenues in Slovenia are lower than the EU average, with lower taxes (especially on capital and property) and higher social contribution revenues. Total revenues from taxes and social contributions amounted to 38.5% of GDP in 2021, similar to 20 years ago, but below the peak in 2005 and 3.2 p.p. lower than the EU average. The lag behind the EU comes from tax revenues, which amounted to 21.8% of GDP in 2021, one of the lowest shares in the EU (5.7 p.p. below the EU average). Capital and property taxes are particularly low compared to the EU average⁶⁷. The share of social contributions revenue, on the other hand, exceeded the EU average by 2.5 p.p. and was among the highest in the EU. This is also linked to their important role in financing social protection systems and the smaller share of financing these systems from the state budget (which is mainly tax-based) than in other countries. In Slovenia, social contributions paid by employees also account for the largest share of the tax wedge on labour costs,⁶⁸ which was higher than the EU average for various income groups in Slovenia in 2021.

Tax reforms in Slovenia have so far mostly been carried out in a way that has not been fiscally neutral, as they were mostly about income tax reliefs. Most of the tax changes since 2005 went towards reducing the tax burden, through tax rate reductions or reductions in the tax base linked to tax reliefs.⁶⁹ Although reductions of tax burden in one tax have often been combined with simultaneous increases in other taxes to compensate for the shortfall in tax revenue, these changes have largely not been fiscally neutral. As a result, tax revenues reached their lowest share of GDP since 1995 in 2020, before rising slightly last year following a strong pick-up in domestic consumption. Tax changes over the years have been reflected in a reduction in the implicit tax rate (ITR) on labour, which remains the highest among ITRs, an increase in the ITR on consumption and a sharp reduction in the ITR on corporate income. There have also been increases in the ITRs on capital and some capital income of households and businesses, where tax rates are relatively low and revenues from these taxes are low.

The future challenges are becoming increasingly complex and, in combination with the current challenges, are also introducing conflict into decisions on tax changes and on the timing of their implementation. Long-term projections of the impact of demographic change show that, with unchanged policies, it will lead to higher social protection expenditure and a widening gap between this and funding sources. At the same time, the current fiscal rules assume that, in the face of these demographic pressures, countries will need to pursue fiscal policies that reduce or limit the future increase in debt

⁶⁷ In terms of economic function, labour taxes, similarly as in the EU overall, accounted for the largest share of GDP in Slovenia in 2020, at 20.1% (EU 21.5%), followed by consumption taxes at 12.3% (EU 10.8%) and capital taxes at 5.2% (EU 7.9%). The distribution of the tax burden by tax base shows a similar picture for 2020: labour taxes 53.4% (EU 53.5%), consumption taxes 32.8% (EU 26.8%) and capital taxes 13.8% (EU 19.7%).

⁶⁸ The tax wedge (according to OECD methodology) calculates the amount of tax charges in labour costs, which reveals the total share of personal income taxes, and employers' and employees' social contributions, reduced by family benefits received as monetary transfers, in total labour costs, which must be paid by employers for their employees.

⁶⁹ Some tax or contribution increases have been introduced mainly in a period of fiscal consolidation, while excise duty increases on tobacco and tobacco products are linked to health policy. In 2021 and 2022, some of these increases have already been eliminated (luxury tax on motor fuels), and duties due to high energy prices have been reduced (excise duties on energy products and other energy duties).

stemming from demographic change already over the medium term. On the other hand, irreversible natural processes due to climate change suggest a counter medium-term need for an expansion of investment, including public investment, to achieve the green transition goals by 2030, and similar is true for other areas, such as retraining and strengthening social networks for the population in the context of the transition to the Fourth Industrial Revolution or strengthening Slovenia's innovation potential.

3.2

Social capital

Employee motivation, engagement and performance, as well as job and workplace quality, are important factors of labour productivity or social capital. In addition to the technological resources of work (physical capital) and the skills and abilities of employed persons (human capital), labour productivity is also influenced by the organisation and relations within the work process and wider society (social capital). In the field of work, employees' social capital is measured by analysing their values and attitudes towards work, working conditions, job quality, participation in decision-making, motivation, engagement and so forth. For many years, analyses for Slovenia have shown high employee identification with the work organisation, the workplace and the job, which can contribute to productivity, but also poor employee perceptions of job quality, earnings and material well-being and, above all, poor self-perceptions of the quality of health and ability to continue with working life. While short-term productivity growth and financial performance of companies may stem from weak employee social capital and poor working conditions, this has long-term consequences for employees, operation of companies (see Chapter 4) and society: employees' health, job and life satisfaction, and social and emotional well-being deteriorate, and hidden costs increase due to absenteeism, healthcare costs, incapacity for work and so forth, which has a deteriorating impact on the quality of life of employees and on society at large (EU-OSHA, 2022; Eurobarometer, 2018; Eurofound, 2016a; Eurostat, 2022c; Gallup, 2017, 2019, 2020, 2022; Hafner-Fink et al., 2019).

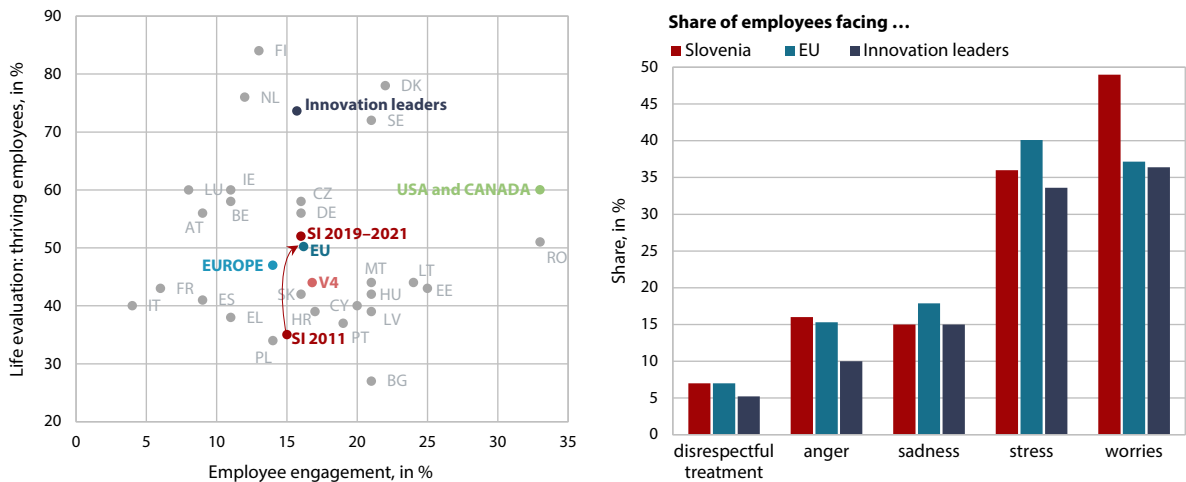
Among the ten world regions, Europe ranks last in employee engagement⁷⁰ and third in the share of successful employees⁷¹; Slovenia is around the EU average for both indicators but lags far behind the average of the innovation leaders in the self-perception of employees' well-being. Employee engagement is one of the most important factors in the success of companies, as increasing the proportion of engaged employees increases company profits and productivity, the quality of products and services, safety at work, and employee participation and well-being (Gallup, 2022). This has the effect of reducing turnover and absenteeism and increasing employee performance and engagement, which also enhances innovation, work and job satisfaction, and quality of work, as engaged employees are highly involved in the company and thus also psychologically "own" the company (Gallup, 2022, p. 164). In the period 2019–2021, the share of engaged employees in Slovenia increased, reaching the EU average and the average of innovation leaders (Figure 20, left), but the share of employees who perceived their life as successful is, despite a significant increase (by 22% p.p. in the last decade), lower than the average

⁷⁰ Employee engagement (Gallup Q12 Index) includes employees' basic needs, motivation, belonging and personal growth (Gallup, 2022).

⁷¹ Employees who perceive themselves as thriving have positive views of their personal life situation, have a positive views on the future, have significantly fewer health problems and negative daily feelings, and are happy, respected and hopeful (Gallup, 2022).

of innovation leaders, partly due to more frequent negative emotions and employee ill-being (Figure 20, right). Globally, the US and Canada have the highest proportions of engaged employees (33%), while Australia and New Zealand have the highest proportions of thriving employees (63%).

Figure 20: The share of engaged and thriving employees in Slovenia has increased over the last decade and is comparable to the EU average (left), while well-being lags behind the innovation leaders partly due to a higher share of employees experiencing negative emotions (right) (2019–2021)



Source: Gallup (2022). Notes: Employee engagement includes the basic needs of the employee (knowing what is expected of them in the workplace; having what it takes to do a good job), motivation (doing what they are best at; having their achievements recognised and rewarded; being respected as a person; having career development plans), belonging (having their work matter and be respected; having committed colleagues, including a friend), and personal growth (personal progression, learning and development). Thriving employees are positive about their present life situation, have a positive views on the future, have significantly fewer health problems and negative daily feelings, and are happy, respected and hopeful.

Among job and workplace quality factors, Slovenia ranks worse compared to the EU and innovation leaders, especially in working time flexibility and compliance with occupational health and safety standards, but better in skills, training and cognitive development of employees. In terms of the physical working environment and intensity of work, we rank close to the EU average and the innovation leaders, but with some diverging factors.⁷² Major shortcomings are seen in the introduction of flexible work and working time to better reconcile employees' work and family life, which contributes to poorer self-assessment of employees' health and ability to continue their working lives (Eurofound, 2016b; ISSP Research Group, 2017). Collective agreements also mainly regulate institutes that contribute to more flexible working time arrangements but less to the protection of workers and the reconciliation of work and family life (Senčur Peček, 2018). Adequate modernisation and automation of work processes, through digitalisation and other worker-centred processes, can address some of the shortcomings and weaknesses currently faced by employees in Slovenia; without more decisive action in line with already established occupational safety and health (OSH) standards, however, the physical and mental health of employees will continue to deteriorate.⁷³ However,

⁷² Compared to the EU average and innovation leaders, Slovenia has an above-average proportion of employees whose work involves repetitive movements, tiring or painful postures, and/or exposure to noise and low temperatures (EU-OSHA, 2022). Some aspects of work intensity are also above average: the number of hours worked per employee, irregular working hours, the proportion of employees who experience stress at work and the fast pace of work. The proportion of employees who can take a break when they need one and similar is also very low compared to the innovation leaders (Eurofound, 2016b; ISSP Research Group, 2017).

⁷³ OHS governance is better established than the EU average but less frequently acted upon. Employees are more exposed to risk factors in the workplace, and fewer organisations respond to them with preventive measures. Between 2017 and 2019, absence due to sickness and accidents at work increased more than in the EU, most

employees' cognitive development is better rated than the EU average: more employees receive on-the-job training and more perceive that they have interesting work that they can do autonomously, but they are less likely to solve complex tasks or unforeseen problems on their own.⁷⁴

Employee participation in management and decision-making in companies and other organisations is also below the EU average and that of the innovation leaders, while the share of employees who perceive themselves as having opportunities for promotion is above average. Participation in management and decision-making in companies and other organisations tends to increase job satisfaction and willingness to change among employees, and thus also affect productivity and business performance. In 2019, Slovenian organisations were less likely than the EU average and innovation leaders to discuss OSH or the risks of digitalisation with employees but more likely to discuss maintaining productivity. Compared to innovation leaders, fewer employees in Slovenia feel fairly treated at work, and more often find themselves in situations that make them feel emotionally uncomfortable. Although supervisors are more likely to praise workers, the latter are less frequently rewarded, but more of them perceive opportunities for promotion, which is positive for their career development. It is also positive that fewer employees in Slovenia perceive violence, intimidation or harassment at work by their superiors or colleagues, but this may also be due to insufficient knowledge of rights and options in cases of unacceptable treatment at work. This is likely a result of below-average labour participation⁷⁵ and the opinion that trade union organisation has a negative impact on the economy,⁷⁶ which are important for workers' awareness and the strengthening of workers' rights (EU-OSHA, 2022; Eurofound, 2016b; ISSP Research Group, 2017).

3.3

Human capital

In Slovenia, the lack of adequate labour and skills is becoming an increasingly important limiting factor for raising productivity and developing the economy.

The Eurochambres European Economic Survey 2022 shows that labour shortages are a major challenge for more than 70% of companies in Slovenia, which is the highest share in the EU alongside Austria and Latvia (CCIS, 2021). The job vacancy rate,⁷⁷ standing at 2.6%, reached an all-time high in 2021 (2.3% in the EU and 3.3% in the innovation leaders). Of the various sectors, the rates are highest in construction (5.9%), administrative and support service activities, and accommodation and food service activities (Eurostat, 2022c). The availability of skilled labour in 2021 is estimated to be lower than in all innovation leaders,⁷⁸ with the gap with the average of these countries widening compared to a year earlier (IMD, 2021b). This section

notably in health and social care. Slovenia lags far behind the average of the innovation leaders in most of the R&D indicators (EU-OSHA, 2022).

⁷⁴ More employees than the average of innovation leaders feel that they are able to contribute to improving their organisation and work processes, that their work meets rigorous quality standards and that their work is beneficial to society. On the other hand, the proportion of those who are able to solve problems themselves or change ways of working is smaller (Eurofound, 2016b; ISSP Research Group, 2017).

⁷⁵ The share of companies with works councils as a form of co-management is lower than the EU average and the innovation leaders (EU-OSHA, 2022).

⁷⁶ A lower proportion of employees than the average of innovation leaders think that workers need strong trade unions, and a higher proportion think that strong trade union organisation is bad for the economy (ISSP Research Group, 2017). Trade union representation in standard and non-standard forms of work is also below average (OECD, 2019d; OECD/AIAS, 2021).

⁷⁷ The ratio of vacant to filled jobs (a higher percentage indicates employers' difficulties in finding workers).

⁷⁸ Slovenia is ranked 13th out of 26 EU Member States in terms of availability of skilled labour in 2021, which is worse than all innovation leaders (IMD, 2021b).

therefore focuses on how to make more efficient use of existing human capital (including adapting it to changing needs), and in Part 2 on how to increase it also by recruiting foreign labour, including by attracting top professionals.

3.3.1

Strengthening available human capital and adapting to changing needs

The shares of tertiary-educated adults and of those in employment have been rising for many years, but the share of those in employment requiring no more than upper secondary education has also been increasing. Due to long-standing high participation of young people in upper secondary and tertiary education and the transition of younger, better educated generations into older age groups (demographic effect), the shares of adults and of the active working population with at least an upper secondary education increased in the 2008–2021 period and were higher than the average in the EU and in the innovation leaders.⁷⁹ The share of tertiary-educated employed persons has also increased but remains below the average of the innovation leaders (Figure 21, left). At the same time, the share of persons (20–64 years) with tertiary education employed in occupations requiring no more than upper secondary education (the share is higher in the private sector) was increasing for most of this period, which is not encouraging for raising the competitiveness of the economy or points to an insufficiently ambitious process of transformation of the business sector. While the share of such jobs is even higher on average in the EU and in the innovation leaders (Figure 21, right), it is not increasing. The share of employed persons with low educational qualifications fell over the 2008–2021 period and is mostly much lower than the average of the innovation leaders⁸⁰ in sectors employing the most low-educated people, but it is not negligible in the 45–64 age group.

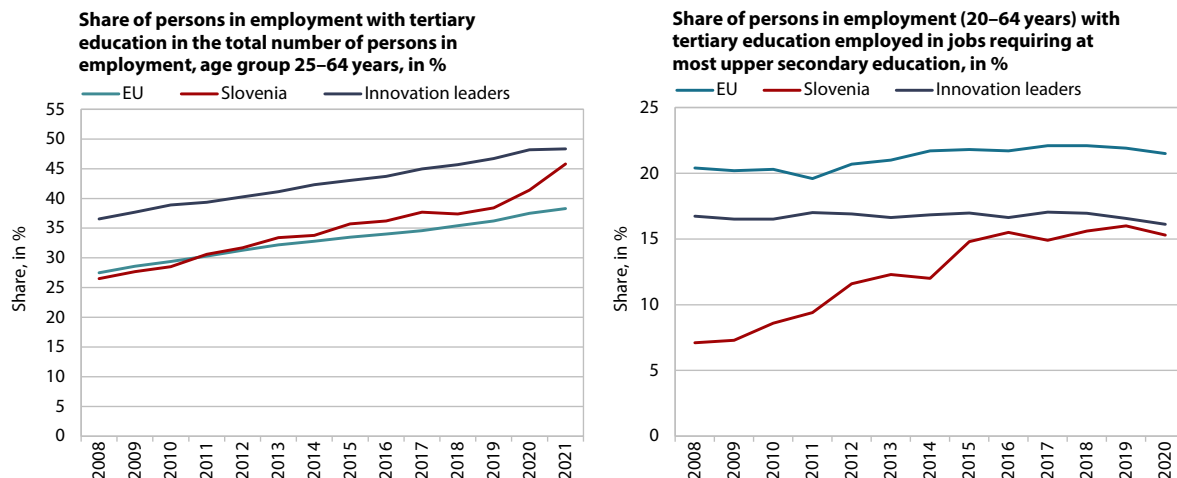
Discrepancies between upper secondary and tertiary enrolments and labour needs constrain development (in the long term). Employers in the business sector have long been facing a shortage of a wide range of profiles with upper secondary vocational and professional education (ESS, 2022).⁸¹ Particularly notable among the tertiary-educated profiles is the shortage of ICT specialists and other engineers (DIH, 2021; IZS, 2022; Krivec, 2021; Turk, 2022; ESS, 2021), who are of key importance for a successful green and digital transition (Muench et al., 2022a). This is linked to the low number of science and technology graduates, which, while increasing in 2021, is still far from the peak in 2012, and their share in the total number of tertiary graduates has been roughly the same over the last three years (just over 28%). In the context of strengthening the country's development and research potential, the low number of new doctoral graduates is also unfavourable; it was the lowest in the last ten years in 2021 (SURS, 2022d). Long-term development potential is also constrained by increasingly acute staff shortages in some other areas more broadly linked to economic performance, such as healthcare and education. The labour market has also recorded an oversupply of certain arts and humanities graduates and graduates of some social sciences (ESS, 2021).

⁷⁹ In 2021, 94.5% of employed persons had at least upper secondary education (EU: 84.7%; innovation leaders: 89.6%) (Eurostat, 2022c).

⁸⁰ In 2021, the share of employees with low educational qualifications was 14.3% in mining and quarrying (EU: 10.6%), 12.9% in construction (EU: 24.9%), 10.4% in water supply, sewerage, waste management and remediation activities (EU: 25.4%), 9.2% in accommodation and food service activities (EU: 28.3%), and 8.8% in manufacturing (EU: 17.7%) (Eurostat, 2022c).

⁸¹ According to the Employment Forecast (ESS, 2022), there is a shortage of drivers of HGVs, masons, welders, waiters, salespersons, cooks and storage workers.

Figure 21: The strong increase in the share of employed persons with tertiary education (left) and employed persons with tertiary education in occupations requiring no more than upper secondary education (right)



Source: Eurostat (2022c) (figure left); EC/EACEA/Eurydice (2020) (figure right).

In particular, the green and digital transitions call for the adaptation and strengthening of knowledge, skills and competences. The green and digital transitions are increasing the need for new skills for existing jobs, especially for low-educated workers, but also for (re)training in other occupations or job tasks. Alongside the relevant green⁸² and digital skills, employees also need so-called transversal skills (Cedefop, 2022). In Slovenia, they are particularly deficient in social intelligence, communication skills, verbal skills, cooperation with others and adaptability (OECD, 2021f). While education and training of employees is being provided for the transition to a low-carbon society, various stakeholders (universities, the Ministry of Education, Science and Sport, etc.) are not sufficiently involved in its design, and there is a need for systematic monitoring of its effects (IJS, 2022) and, given the high needs of the green transition (Chapter 5), also for the reinforcement of this type of training. In the development of digital skills of employed persons,⁸³ the unemployed and those in education, the gap with the EU average and even more so with the innovation leaders in terms of very good digital skills stands out (Figure 22, left).

Continuous education and training of all staff is essential to cope with rapid change and must be planned taking into account actual (especially future) skills needs. In 2020 (latest data available), when the COVID-19 epidemic broke out, the share of companies providing continuing vocational education and training for their employees was higher than the EU average and that of the innovation leaders. The share of employees in education or training was also higher, but employees who were in education or training spent less time in education or training on average.⁸⁴ In addition, the proportion of employees in education or training fell compared to a decade earlier (Figure 22, right). The low shares in small enterprises and in sectors employing a higher share of low-educated people stand out (Eurostat, 2022c), which is why these sectors and enterprises may have more difficulties in responding to changes due to the green and digital transition, population ageing, technological

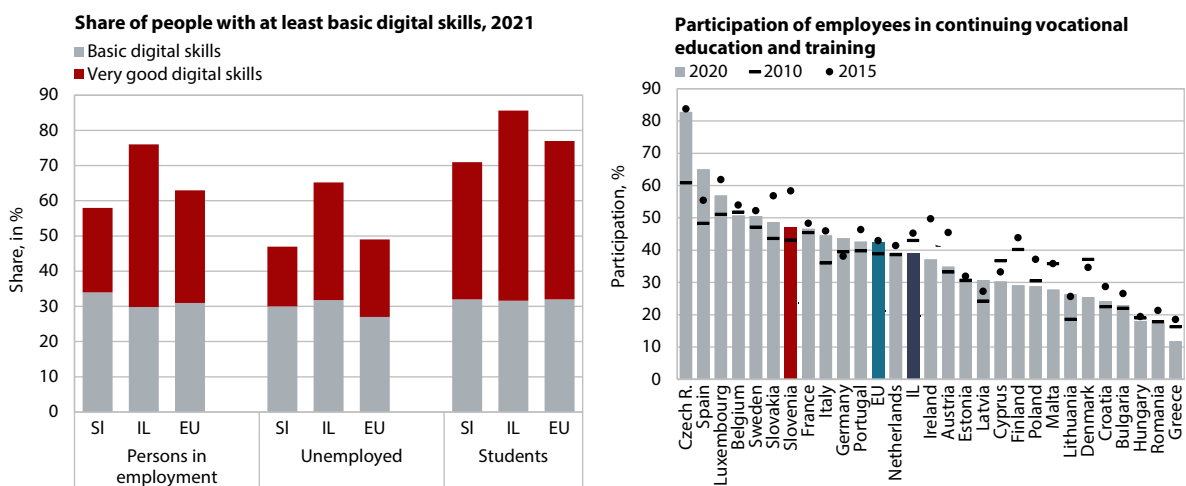
⁸² Essential for a successful green transition are the acquisition of so-called green skills, which enable employees in all sectors and occupations to reduce the negative impact of their activities on the environment, and the need to acquire technical skills related to green technologies (Cedefop, 2022).

⁸³ In 2021, the share of employed persons with basic digital skills in Slovenia was 34% (EU: 31%; innovation leaders: 30%) and with very good digital skills 24% (EU: 32%; innovation leaders: 46%).

⁸⁴ In 2020, the average time spent in education or training in Slovenia was 21.3 hours (EU: 22.6 hours; IL: 25.5 hours), compared to 24.1 hours in 2015 (EU: 23.6 hours; innovation leaders: 27.9 hours).

advances and so forth. After years of decline, adult participation in lifelong learning, which covers the employed, the unemployed and the inactive, showed an increase in 2021⁸⁵ (Eurostat, 2022c), which was mainly due to the rise of webinars during the epidemic, the enhanced delivery of publicly funded training and the large supply of free training and to methodological changes⁸⁶ (SURs, 2022b). Slovenia was well above the EU average but lagged behind the innovation leaders.⁸⁷ It is also important to know the medium-term knowledge and skills needs for the planning of training and (re)training of employees. In this respect, the absence of a medium-term monitoring and forecasting system for skills needs, based on a partnership approach and taking into account the impact of the green and digital transitions and other development trends on skills needs, is a shortcoming.

Figure 22: The gap in digital skills with the EU and innovation leaders (left) and the decline in the participation of employees in continuing vocational education and training between 2015 and 2020, which remains high (right)



Source: Eurostat (2022c).

Young people still have untapped opportunities to make more effective use of the knowledge acquired during their education. In 2021, as labour market conditions improved, the youth labour force participation rate rose again; it was higher than the EU average though lower than in the innovation leaders.⁸⁸ However, as in other EU Member States, young people are more exposed to temporary jobs. The share of young people (15–29 years) in temporary employment is above average compared to the EU and innovation leaders, mainly due to student work. At the same time, the share of young people who are in temporary employment because they have not found a permanent job⁸⁹ is lower than the EU average (Eurostat, 2022c). The number of unemployed young people (up to 29 years) with tertiary education has been declining from its peak in 2013 to 2019, but the share of tertiary-educated young people (25–34 years) employed in occupations requiring no more than upper

⁸⁵ Adult participation in lifelong learning in 2021 was 18.9% (EU: 10.8%, innovation leaders: 24.9%) (Eurostat, 2022c).

⁸⁶ In the Active and Inactive Population Survey, which is the source of data for the calculation of the adult participation in lifelong learning indicator, the target population is all residents of private households in Slovenia from the first quarter of 2021 and all residents of Slovenia up to and including the end of 2020 (SURs, 2022b).

⁸⁷ Lifelong learning includes formal and non-formal education of adults (Eurostat, 2022c).

⁸⁸ The labour force participation rate of young people (20–34 years) with upper secondary or tertiary education who obtained a job within three years of leaving school was 83.4% in 2021 (EU: 78.6%; innovation leaders: 85.1%) (Eurostat, 2022c).

⁸⁹ The share of young people in temporary employment because they have not found a permanent job in 2021 was 7.1% (EU: 9.3%; innovation leaders: 5.1%) (Eurostat, 2022c).

secondary education increased sharply between 2008 and 2021 (from 9.8% to 23.3%) (SURS, 2022a). They are thus not making sufficient use of the knowledge they acquired during their studies. Poor working conditions also encourage them to look for jobs abroad (Valentinčič et al., 2022), where companies often pay more attention to attracting and retaining talent.⁹⁰ Slovenia is ranked 18th out of 26 EU Member States in terms of negative impact of the brain drain in 2021, which is worse than all innovation leaders (IMD, 2021b).

Better management of different age groups of employees can make an important contribution to prolonging and maintaining the employment of older people, which is low in Slovenia. The employment rate for older workers (55–64 years) in Slovenia in 2021 was lower than the EU average,⁹¹ as was the share of such workers in part-time employment (11.1%; EU: 19.8 %). At the same time, the share of part-time workers due to sickness or disability (56.5%) was the highest among EU Member States, which (in addition to a high level of disability) may also point to insufficient adaptation of jobs to older workers in the country. To maintain and extend the employment of older workers, it is therefore necessary to strengthen measures to manage the different age groups of employees and adapt jobs.⁹² In addition, it is important to recognise that older people, like young people, represent a potential and opportunity for companies to transfer knowledge and experience from older to younger workers and vice versa, with a positive impact on the development of all employees (Veingerl Čič and Zizek, 2017). This transfer of knowledge and experience also encourages the creation of innovative ideas and solutions and contributes to better employee results.⁹³

3.3.2

Attracting and integrating labour from abroad

Over the past decade, the Slovenian economy has been reducing the labour supply gap by increasing the recruitment of immigrants, which can only be achieved in the future through a more proactive migration policy. Over the last decade, there has been an increase in the employment of foreign immigrants, especially men (Figure 23, left). At the end of 2021, there were 115,693 non-nationals in employment in Slovenia, most of them in construction, manufacturing, transportation and storage (data by SRDAP, SURS, 2022d). However, many employers face barriers to hiring immigrants, in particular lengthy procedures to obtain work permits for third-country workers (CCIS, 2022a), who predominate among immigrant employees (85.7% in 2021). In recent years, the largest number of people immigrating to Slovenia for employment purposes has come from Bosnia and Herzegovina (about half of the immigrants in 2020), with which Slovenia has concluded an employment agreement (BBHZD, 2013). Other countries of the former Yugoslavia follow, while other European and non-European countries remain a potential source of labour, with fewer immigrants and employees from these countries (SURS, 2022d).

⁹⁰ Slovenia is ranked 14th out of 26 EU Member States in terms of attracting and retaining talent in 2021, which is worse than all innovation leaders (IMD, 2021b).

⁹¹ The employment rate of older workers (55–64 years) in Slovenia in 2021 was 52.7% (EU: 60.5%) (Eurostat, 2022c).

⁹² An example of measures is the Comprehensive support for businesses to encourage active ageing of the workforce (ASI) (Mirčeva and Beltram, 2021).

⁹³ A survey on intergenerational cooperation in companies in Slovenia, which sampled 392 employees, found that three-quarters of them believe that successful companies in Slovenia have an effective system of transferring knowledge and skills from older to younger workers and about half of them also believe that they have an effective system of reverse mentoring, i.e. from younger to older workers (MDDSZ, 2021).

Immigrants who are not in employment, especially women, are also a potential source of additional labour. In 2021, a quarter (18,500) of immigrants aged 20–64 were not employed,⁹⁴ with women predominating (14,000) (Figure 23, left).⁹⁵ Immigrants for employment reasons were mostly men, while women came mainly to reunite with their families. In addition to increased immigration for employment reasons, there has also been an increase in immigration for family reunification (Figure 23, right). However, many immigrant women who would like to work often do not enter the labour market because of family commitments and other reasons,⁹⁶ a consequence of the failure to mainstream gender equality in migration and integration policies (Povod, 2021). For low-educated immigrant women (who have the lowest employment rates) and those with upper secondary education, strengthening lifelong career guidance and education and (re)training, in particular, could contribute to their greater participation in the labour market and thus to a greater supply of shortage skills. Immigrant women with tertiary education also have difficulties finding suitable jobs. According to data for 2020, a higher proportion of tertiary-educated immigrant women than non-immigrant women (or immigrant men) were employed in occupations for which a lower level of education is sufficient (Eurostat, 2021b). However, both immigrant women and immigrant men have problems with the recognition of education acquired abroad (Medvešek et al., 2022), which puts them on an unequal footing with non-immigrants.

A proper integration policy for refugees and migrants could provide Slovenia with new sources of labour. In this context, it is important, on the one hand, to highlight the migration opportunities in the framework of the Pact on Migration and Asylum, where the European Commission (EC, 2022h) encourages Member States to active resettlement, and the displaced persons from Ukraine who are granted temporary protection.⁹⁷ On the other hand, there is also the potential to increase the number of applications for international protection (MNZ, 2022), where Slovenia is often a distinct transit country (Ladić et al., 2022). In terms of integration into society and the labour market, it would make sense to develop social and cultural integration programmes for all these groups and give them access to the labour market.

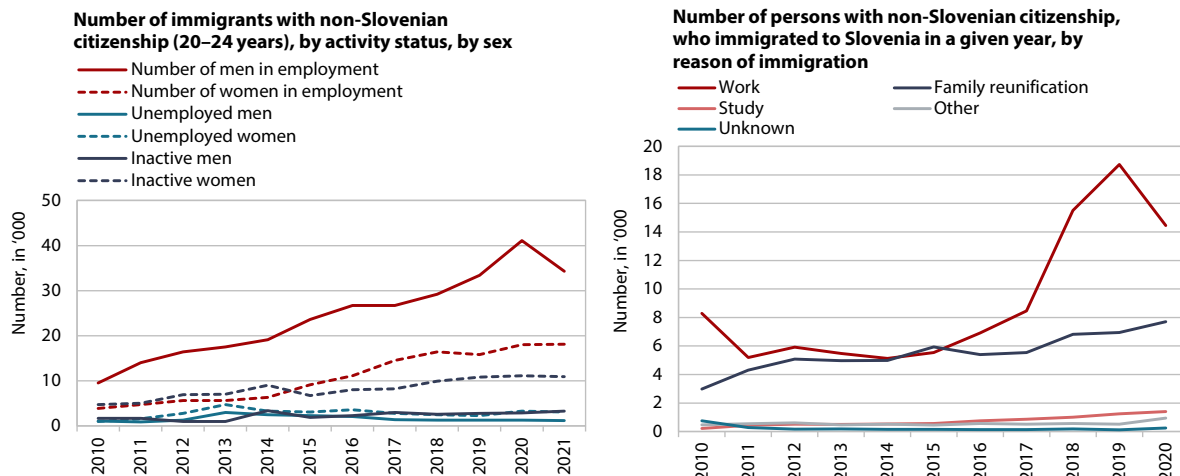
⁹⁴ In 2021, 6.1% of immigrants (aged 20–64) were unemployed and about a fifth were inactive (Eurostat, 2022c).

⁹⁵ 14,000 immigrant women (43.8%) were not employed (compared to 11.6% of immigrant men). In 2021, almost a tenth of immigrant women (aged 20–64) were unemployed and slightly over a third were inactive (Eurostat, 2022c).

⁹⁶ In 2015 and 2016 (latest international data), there were 8.4% of immigrant women (aged 15–64) in Slovenia who wanted to work but were inactive due to family commitments and 12.9% for other reasons (OECD, 2018b).

⁹⁷ The Decision on the introduction of temporary protection for displaced persons from Ukraine (2022) entered into force on 10 March 2022.

Figure 23: Large gender gaps in activity status of immigrants (left) and growth in the number of people arriving for employment and family reunification by year (right)



Source: Eurostat (2022c) (figure left) and SURS (2022d) (figure right).

Attracting and retaining foreign workers, including top professionals, requires a more proactive migration and integration policy. It is important to ensure quality living conditions and opportunities for immigrants to integrate into society. In Slovenia, immigrants often face inadequate living and working conditions (Working group on asylum and Counselling Office for Workers, 2021). Additional obstacles were introduced by the Act Amending the Foreigners Act (ZTuj-2F, 2021), which tightened the conditions for family reunification and for knowledge of the Slovenian language. The barriers faced by immigrants can discourage new human resources and force existing ones to seek employment in another country. It should be noted that labour shortages are also acute in many other EU Member States (EIB, 2016) which often implement more ambitious migration and integration policies (OECD, 2019c, 2021d) and also attract top-quality human resources through well-considered and targeted measures. As scientists and other top professionals are key to innovation-led growth, Slovenia needs to strengthen measures to attract them, simplify procedures related to their recruitment (CCIS, 2022b; Valentinčič et al., 2022), and provide information and advisory support to all those who wish to immigrate to Slovenia to help them integrate into the workplace and into society. Particularly important in encouraging the return of professionals who have emigrated abroad is improving working conditions and opportunities for their professional development (Valentinčič et al., 2022).

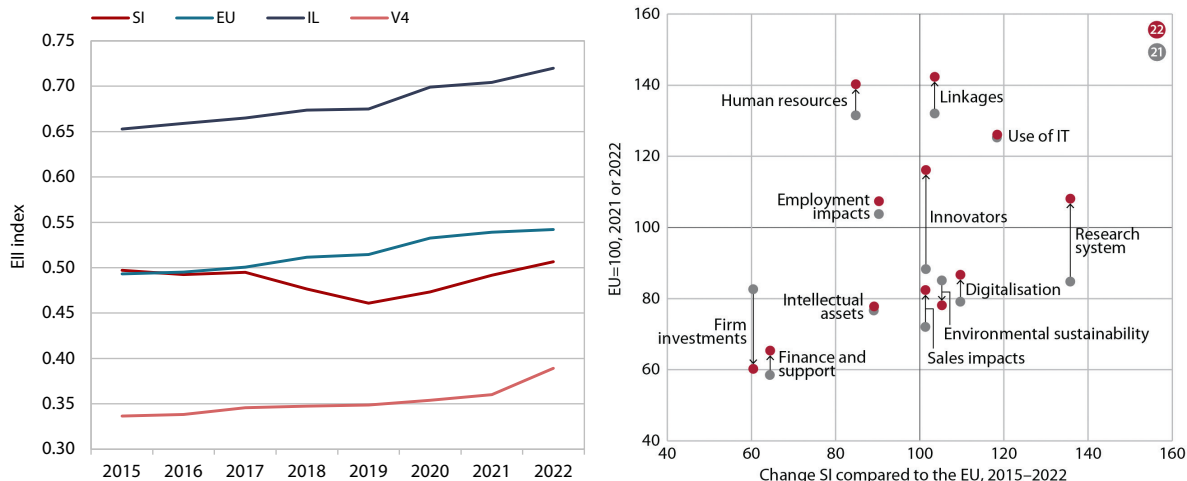
3.4 Transition to innovation-led growth

The transition to innovation-led growth is the basis for raising the value added of products and services and, as a result, catching up with the most developed countries in terms of productivity and economic development. Strengthening research, development and innovation activities and an efficient and comprehensive digital transformation of the economy are particularly crucial for this.

3.4.1 Research, development, entrepreneurship and innovation

After a sharp decline until 2019, the performance of Slovenia's innovation system according to the European Innovation Index (EII) 2022 has improved for the third consecutive year; this, however, has still not been enough to close the gap with the innovation leaders. According to the European Innovation Scoreboard, Slovenia has been closing the gap with the EU average since a sharp deterioration in 2019, but it is not until 2022 that it has surpassed the scoreboard value of 2015. This puts it in 13th place among EU Member States, still two places behind where it was in 2015–2018. The gap with the innovation leaders has not narrowed significantly since 2019 and is 7 index points higher than in 2015, while the advantage over the Visegrad countries (V4) is 11 index points lower, with the Czech Republic catching up with Slovenia for the first time, according to the EIS 2022. The main reason for the long-term decline is underinvestment, by both the public and the business sectors, with investment being well below the EU average, even further below that of the innovation leaders and, in the most recent period, even below that of the Visegrad countries. Although human resources remain a competitive advantage for Slovenia, the trend is negative. On the other hand, over the last three years, there have been strong positive trends in the innovation activity of the business sector (innovators), the quality of the research system, and networking and cooperation, all of which are also comparative advantages for Slovenia vis-à-vis the EU, narrowing the gap with the innovation leaders. The need to accelerate Slovenia's innovation capacity is also highlighted by data from the Global Innovation Index (WIPO, 2022), where Slovenia has fallen from 32nd to 33rd place in the last year. Similarly to the EII, this result is due to a relative decrease in inputs and a relative increase in outcomes. In this respect, Slovenia is lagging behind global innovation leaders in the area of market sophistication, mainly related to underinvestment, and creative outputs, mainly related to intangible assets.

Figure 24: Despite progress in some key components of the European Innovation Index (2022), in particular related to innovation activity and linkages, Slovenia’s gap, especially in investment, remains wide

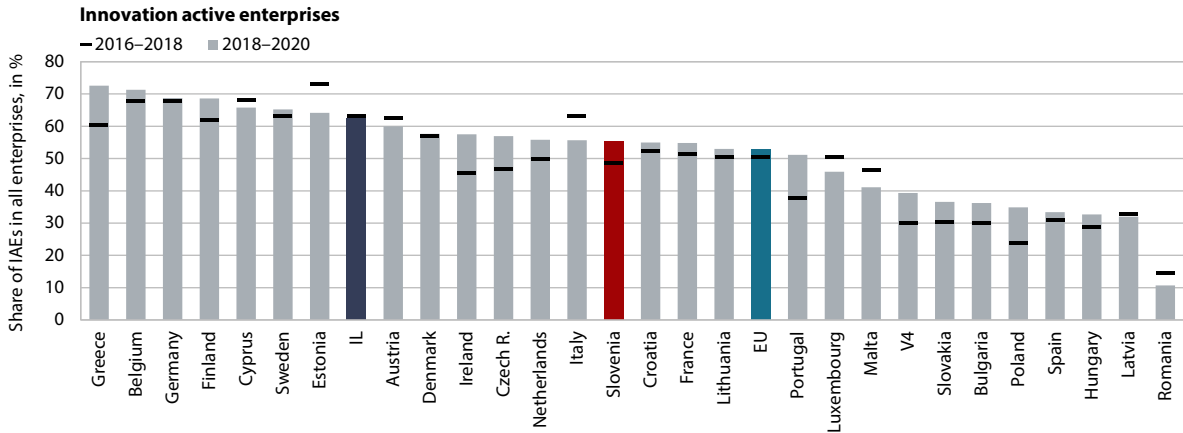


Source: EC (2022f); calculation by IMAD.

In 2018–2020, the innovation activity of enterprises reached its highest level in the last decade, the gap with the innovation leaders remaining only in small and medium-sized enterprises. Innovation activity of enterprises (IAEs) has been increasing again since 2016, and the favourable results are attributed, among other things, to a reversal of the trend in investment in R&D, ICT, and other machinery and equipment, also in conjunction with the re-launch of the development policy after 2016.⁹⁸ There were 55.2% of innovation-active enterprises in Slovenia in 2018–2020,⁹⁹ 6.6 p.p. more than in 2016–2018 and the most in the last decade. This means that Slovenia has also surpassed the EU average (52.7%) for the first time and narrowed the gap with the average of the innovation leaders (62.5%), where only small and medium-sized enterprises still lagged behind. Innovation intensity remains higher in industry than in services, and in large relative to small and medium-sized enterprises, with large enterprises even exceeding the average of the innovation leaders.¹⁰⁰ The results of the latest survey showed that more companies have introduced business process innovation than product innovation, which is a newness compared to previous results and is at least partly linked to the emergence of the COVID-19 epidemic,¹⁰¹ when companies had to adapt their business processes rapidly.¹⁰² A quarter of companies have introduced at least one business process innovation as a result of the emergence of the novel coronavirus, while only a tenth have introduced at least one product innovation (SURS, 2022d).

⁹⁸ Incentives came mainly from EU funding or the Slovenian Smart Specialisation Strategy.
⁹⁹ This is the second consecutive measurement of innovation activity following the methodological changes introduced in line with the revised OECD methodology (Oslo Manual 2018), when a new concept of innovation definition (product – goods and/or services, business process) was introduced. The harmonised survey is conducted every two years and covers companies with at least 10 employees.
¹⁰⁰ Slovenia large companies: 91.8%; average of innovation leaders: 81.3% (SMEs: SI: 53.7%; innovation leaders: 61.8%).
¹⁰¹ In addition to Slovenia, Belgium, France and Germany included questions on the possible impact of the COVID-19 pandemic on the implementation of innovation activities in their national questionnaires (EC, 2022f).
¹⁰² Including in terms of new/changed/improved communication, marketing, logistics, distribution, management methods/business practices within the company or with external users/business partners.

Figure 25: Slovenia was among the group of countries where the share of IAEs increased the most between 2018 and 2020, including some of the innovation leaders and Visegrad countries



Source: Eurostat (2022d), SURS (2022d); calculation by IMAD. Note: IAEs – innovation-active enterprises.

R&D expenditure has been increasing in 2018–2021 after a prior four-year decline but still lags behind the 2012–2013 peak in relative terms to GDP and similarly in international comparisons. The decline in R&D expenditure since 2013 initially stemmed from a reduction in public expenditure in the context of fiscal consolidation following the global financial crisis.¹⁰³ However, business sector expenditure also declined between 2015 and 2017, mainly due to a decrease in the volume of European funding¹⁰⁴ which co-funded business R&D investments in the 2007–2013 Financial Perspective, but also partly due to the data revision.¹⁰⁵ In the following years, with the re-launch of the development policy, the public and business sectors boosted R&D investment, and foreign R&D expenditure largely increased throughout the period 2008–2021. In 2021, according to provisional data from SURS (2022c), total R&D expenditure rose to an all-time high in nominal terms, but in relative terms it stagnated for the second year in a row at 2.14% of GDP,¹⁰⁶ still almost half a percentage point below the 2012–2013 peak and also below the averages of the EU and the innovation leaders¹⁰⁷ (2020: 0.2 p.p. and 0.8 p.p. respectively).¹⁰⁸ In this context, public sector expenditure (the government and the higher education sectors) was still 2.8% lower in nominal terms in 2021 than its peak in 2011. Business sector expenditure also lagged behind the 2014 peak, partly due to a data revision that recognised part of business sector expenditure as funds from abroad due to inconsistent reporting. Due to the non-comparability of these data over time, we can only draw conclusions about the dynamics of the business sector

¹⁰³ By 2017, it had fallen by EUR 117 million or around 40% compared to 2011.

¹⁰⁴ The volume of European funding decreased between 2013 and 2014 with the completed co-financing of R&D projects by state and European funding in Centres of Excellence and in Competency and Development Centres. In addition, the absorption of EU funds under the 2014–2020 Financial Perspective started late. After 2015, the volume of R&D tax reliefs claimed also started to decrease, decreasing again in 2020.

¹⁰⁵ In order to make the application of the methodology more consistent across reporting units, SURS revised the data by source of funds for 2017–2019. The total amount of R&D funding remained unchanged over these years, but according to the audited data, the value of R&D funding by commercial companies decreased and the value of funding from abroad increased. Due to the revision, the data for the business sector and abroad are no longer comparable with the period before 2017 (Trol, 2022).

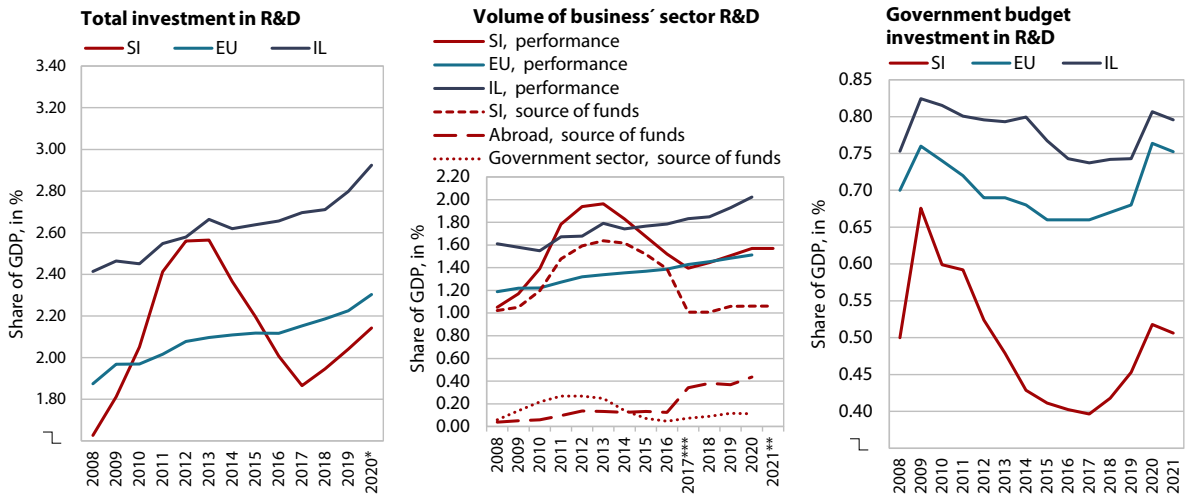
¹⁰⁶ The new legislation already adopted (the Scientific Research and Innovation Activities Act and the Resolution on the Scientific Research and Innovation Strategy of Slovenia 2030) foresees an increase in public funding for R&D to 1.25% of GDP and for total investment in R&D to 3.5% of GDP by 2030 (MIZŠ, 2022; ZZrID, 2021).

¹⁰⁷ The definition of innovation leaders (Sweden, Finland, Denmark, the Netherlands and Belgium) is based on EC (2022f).

¹⁰⁸ The government budget allocations for R&D in GDP is lagging behind in international comparison (in 2021 behind the EU average by 0.25 p.p. and behind innovation leaders by 0.29 p.p.).

R&D activity over this period from data by sector of performance. These show that the value of business sector R&D undertaken in 2021 was the highest ever. The bulk of the shortfall in own funds was made up by funds from abroad, with an average of four-fifths of foreign funds going to the business sector in the period 2017–2020.

Figure 26: Since 2013, Slovenia has seen a significant decrease in total R&D investment relative to GDP



Source: Eurostat (2022d), SURS (2022d). Notes: * Temporary data for the EU and IL (innovation leaders); ** temporary data for Slovenia; *** for Slovenia, the break in the time series in 2017 is due to the revision of the data by source of funds in 2017–2019.

Slovenia lags far behind the innovation leaders in terms of the number of researchers...

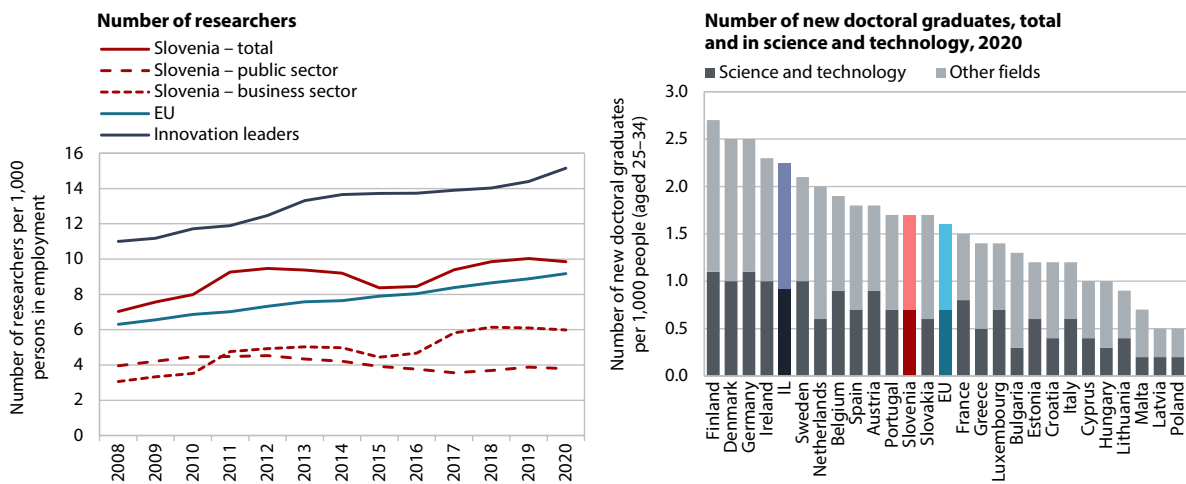
The number of researchers per 1,000 employed persons in 2020 was slightly above the EU average (Slovenia: 10.5; EU: 9.6) but noticeably lower than in the innovation leaders (15.2%) (Figure 27, left). After a few years of growth, it fell again in 2020 (in the public and business sectors), widening the gap with the innovation leaders. Until 2020, the number of researchers had been increasing, mainly in the business sector and thus also that sector’s share of all researchers (60.7% in 2020), which is higher than the EU average (55.4%) though slightly lower than in the innovation leaders (63.3%) (Eurostat, 2022c). In 2021, the number of researchers increased again (to 4,327 in the public sector and 6,628 in the business sector) (SURS, 2022c). The proportion of researchers under 35 is also increasing (32.5% in 2020), but there are differences between sectors: the share of researchers is higher in the business sector than in the higher education sector, where the share of researchers aged 55–64 stands out (SURS, 2022c), which will present a serious challenge in the future. Employment mobility of human resources in R&D, which enables knowledge circulation, is lower than in the innovation leaders (EC, 2022f) with the potential of R&D in Slovenia declining due to the brain drain. In scientific research activities, the decision to go abroad is most often influenced by poor research opportunities in Slovenia, according to researchers who have left Slovenia (Valentinčič et al., 2022), which is confirmed by the IMD data. For 2018, Slovenia is expected to rank 15th out of 26 EU Member States in terms of attractiveness for researchers, behind the innovation leaders (IMD, 2021a).

... and similar is true for the development of future human resources for R&D.

For several years, the number of new PhDs has been far from the high levels of 2013–2015, and at 1.7 per 1,000 inhabitants aged 25–34 in 2020, it was only slightly above the EU average (1.6) and well below that of the innovation leaders (2.2). The number of new PhDs in science and technology is also lower than in the innovation leaders (Figure 27, right) (Eurostat, 2022c). Although the number of researchers involved in

the Young Researchers measure has increased since 2018, it was still lower in 2021 (by 28%) than the 2011 peak (ARRS, 2022) and lower expressed per 1,000 working population (ARRS, 2022; SURS, 2022d). Slovenia is also lagging behind in the area of internationalisation of higher education, which is a way to attract (future, scientific) staff from abroad. The shares of foreign doctoral students in 2020 (latest international data) were 20.1% for Slovenia, which is lower than in the 22 EU Member States that are members of the OECD (24.2%) and significantly lower than in the innovation leaders (35.5%) (OECD, 2022a).

Figure 27: The numbers of researchers and new PhDs are close to the EU average but much lower than in the innovation leaders, with the gap widening for researchers in 2020



Source: OECD (2022c) and Eurostat (2022c). Note: The left figure does not show the private non-profit sector, which has relatively few researchers.

Early-stage entrepreneurial activity¹⁰⁹ remains low in international comparison, while at the same time entrepreneurship continues to strengthen due to promising business opportunities. Entrepreneurial activity, and in particular the innovation-led part of it, with new deep-tech skills and solutions to societal challenges, is an important basis for the transition to innovation-led growth and hence for long-term productivity growth. After the global financial crisis, it peaked in 2016 as the economy recovered, according to GEM;¹¹⁰ since then, it has mostly declined, notably with the emergence of the COVID-19 epidemic in 2020. In 2021, it increased again but remained low in international comparison (6.7%; EU: 8.4%). An encouraging fact is that the share of early-stage entrepreneurs who entered entrepreneurship because of perceived promising business opportunities, after a drop in 2020, increased markedly again in 2021, reaching an all-time high.

¹⁰⁹ Early-stage entrepreneurial activity includes individuals aged 18–64 who have started new businesses or new business activities, including self-employment. It also includes individuals who are owners/managers of new companies that are less than 42 months old.

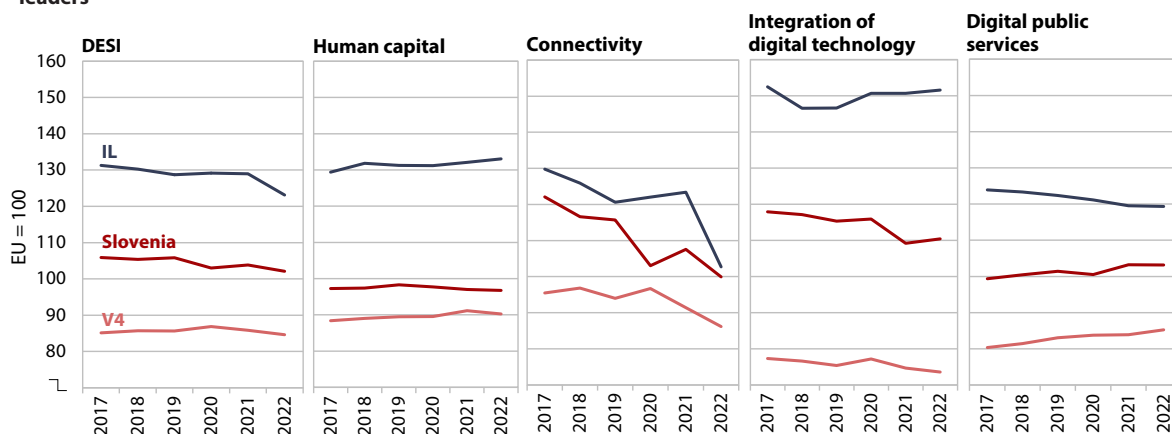
¹¹⁰ The international survey Global Entrepreneurship Monitor, in which Slovenia has participated since 2002. In 2021, 18 EU Member States were included in the survey.

3.4.2

Digitalisation through a comprehensive business transformation

Slovenia has been improving its ranking in the digitalisation of the economy and society over the period 2017–2022 but at the same time its advantage over the EU average has continued to decline. According to the new Digital Economy and Society Index (DESI),¹¹¹ it has ranked 11th over the last two years, which is above average and an improvement on 2017–2020, when it was between 13th and 15th (overtaking Latvia, Lithuania and Belgium). At the same time, its advantage over the EU average continues to fall (from 6 to 2 index points between 2017 and 2022) (Figure 28). The rapid increase in the average EU index value is due to the above-average progress of the large countries Italy and France,¹¹² which shows that Slovenia is relatively behind in digitalisation compared to the average EU citizen or business. This is also confirmed by the IMD (2022b) Global Digital Competitiveness Ranking, according to which Slovenia dropped from 31st to 37th place between 2020 and 2022. In the short term, i.e. between the 2021 and 2022 DESI indexes, the decline has mainly been due to a deterioration in Slovenia’s competitiveness in connectivity. In trend, it is significantly losing its relative advantage in both connectivity¹¹³ and the integration of digital technologies, stagnating in human capital, but advancing in digital public services¹¹⁴ (Figure 28). In addition to technology, the IMD (2022b) points to “future-proofing” (e.g. a country’s cyber-security capability or its attitude to globalisation) as one of the weaknesses and reasons for its decline.

Figure 28: With the exception of digital public services, Slovenia continues its trend of regression or stagnation in other areas of the Digital Economy and Society Index (DESI) compared to the EU average and in particular to the innovation leaders



Source: EC (2022d); calculation by IMAD. Notes: IL – innovation leaders, V4 – Visegrad countries.

¹¹¹ In 2022, the methodology was revised again, so that the results are not fully comparable with those of previous years.

¹¹² The innovation leaders have also reduced their lead over the EU average, while the V4 countries have increased their gap.

¹¹³ In the area of connectivity, it has relatively advanced compared to EU Member States only in the broadband price index.

¹¹⁴ In the area of digital public services, the upgrading of the methodology has been so extensive that back data are not fully comparable. The level of individual indicators, however, shows that Slovenia’s results are above average compared to the EU in terms of the number of users of public e-services, open data, pre-completed forms and digital public services for businesses, while it lags behind in digital public services for citizens.

Slovenia is stagnating slightly below the EU average in the area of human resources, which is crucial for digitalisation, while at the same time there is a trend of an increasing gap with the innovation leaders and a decrease in the advantage over the Visegrad Group (Figure 28). The business sector is facing a growing shortage of ICT professionals: in 2020, 69% of companies faced this problem, which is lower than only the Czech Republic, Austria and the Netherlands.¹¹⁵ At the same time, the share of companies employing an ICT professional in 2020, at 17%, was 2 p.p. lower than the EU average and 9 p.p. lower than in the innovation leaders (Eurostat, 2022c). At the same time, there is a trend of an increasing gap and a decrease in the advantage over the V4 countries. Such trends are related especially to the insufficient number of ICT graduates. This has fluctuated in recent years, with their share in the graduate structure in 2020 at 4.1%, slightly above the EU average (3.9%) but well below the innovation leaders (4.6%). Although the number of ICT enrolments has increased by 36.6% since the 2017/2018 academic year (SURS, 2022d), this does not (necessarily) guarantee a reduction in the supply gap, given the estimated growing needs for digital profiles in the coming years¹¹⁶ (DIH, 2021), which points to the need for facilitating additional enrolments in ICT studies. Slovenia also lags behind the innovation leaders in the development of employees' digital skills, especially advanced skills (see Section 3.3). Lack of the right skills or human resources is therefore the most common problem faced by companies in the digital transformation of their business: around a third of the companies surveyed in 2021 faced this problem. The problem is exacerbated for more specialised skills: for example 63% of companies surveyed in 2021 have not decided to use AI because of a lack of relevant expertise in the company (SURS, 2022d).

Slovenia's competitive advantage vis-à-vis the EU in digitalisation and automation of the business sector is also gradually declining (while the gap with the innovation leaders is widening), although Slovenia remains relatively competitive in the field of robotics and e-sales... Slovenia's DESI ranking of 9th in digitalisation and automation remains stable, but at the same time the advantage over the EU average is decreasing (by 8 index points) and the gap with the innovation leaders has increased by 6 index points between 2017 and 2022. Slovenia is exceeding the EU average in e-sales, especially in terms of the share of e-sales revenues, while online sales to other EU Member States are also showing favourable trends. It also ranks very well in robotisation and the interconnection of devices and systems (IoT), where it exceeds even the innovation leaders: it ranks third in the share of companies using robots (industrial robots), second in the use of IoT and even first in the EU among large companies in both indicators. Despite its high ranking in terms of the share of companies using industrial robots,¹¹⁷ data on the intensity of robot use show the opposite trend: it has fallen from 8th to 10th place in terms of the density of robots per employee (IFR, 2021), which, due to the high share of companies using robots, could be an indication of widespread inclusion of companies in modernisation processes which remain relatively shallow and less thorough than in other countries.

... while falling further and further behind in the integration of, in particular, more sophisticated (digital) technologies. The deployment and use of more sophisticated technologies remains a challenge, especially for SMEs. SMEs are comparatively lagging behind in the use of ERP systems and 3D printers (Figure 29),

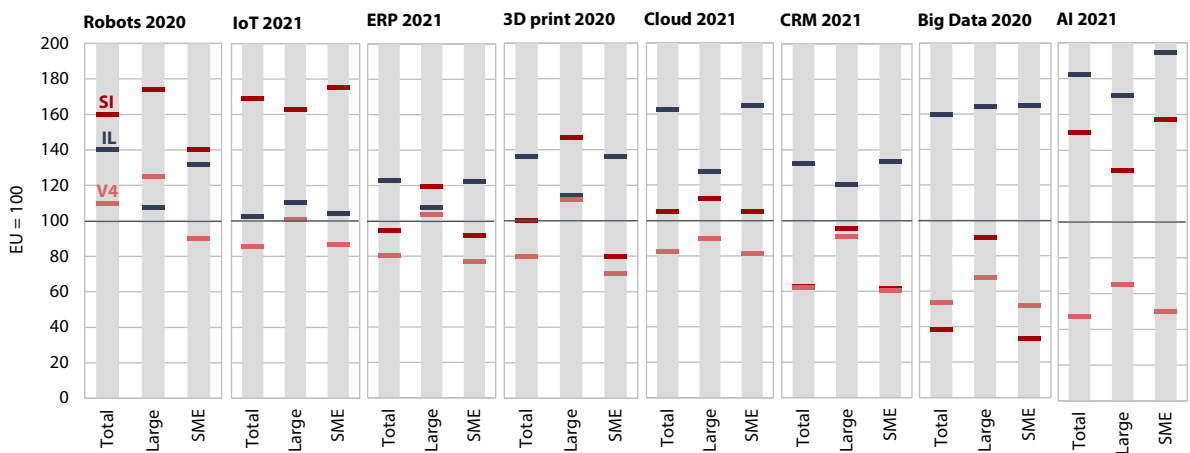
¹¹⁵ There are 55% such firms in the EU and 60% in the innovation leaders.

¹¹⁶ According to the Digital Profiles Human Resources Needs Analysis, conducted among Slovenian organisations between 12 November 2020 and 31 January 2021, the need for digital profiles will increase in the coming years. Of the 115 organisations surveyed, 37% estimate that their need for ICT professionals will increase by 50–100%.

¹¹⁷ Between 2018 and 2020, it moved up from 7th to 3rd place (Eurostat, 2022c) in the EU.

and all companies are lagging behind in the transition to cloud technologies, CRM systems and the use of big data,¹¹⁸ including large companies, which could be related to the still prevailing focus on traditional types of production and business,¹¹⁹ but is also likely to be influenced by the aforementioned lack of adequate human resources. At the same time, while the data on the use of artificial intelligence continue to place Slovenia among the more competitive countries, including in the SME segment, this is not sufficient to prevent Slovenian companies from falling further behind in terms of digital intensity: in 2018 they still ranked 5th, while in 2021 they had fallen to 10th in the EU.¹²⁰ Preliminary data on the maturity of companies in deploying Industry 4.0 also indicate stagnation: between 2018 and 2022, the share of surveyed companies showing a high level of readiness (for methodology, see IMAD (2020)) even fell from 26.3% to 24.4% (for illustration, see Figure 30, right).

Figure 29: Comparison of the use of different (digital) technologies by country group and by company size (EU=100)



Source: Eurostat (2022c); calculation by IMAD. Note: Red – Slovenia, green – IL (innovation leaders), grey – V4 (Visegrad countries).

The in-depth digital transformation of companies has been slow, and the COVID-19 crisis has not been a significant contributor to faster progress.

Although Slovenian companies reportedly show a relatively high and increasing degree of responsiveness and adaptation to opportunities and threats (IMD, 2022a), this is not reflected in the dynamics of digital transformation. Slovenia is indeed one of the countries lagging behind in digital transformation (Figure 30, left), where the main concern is the slow pace of progress, with the gap with more digitally advanced countries widening and that with those lagging behind narrowing. The data show that the impact of the COVID-19 crisis was mainly reflected in the acceleration of the use of basic digital tools (e.g. communication tools), but also for example in the

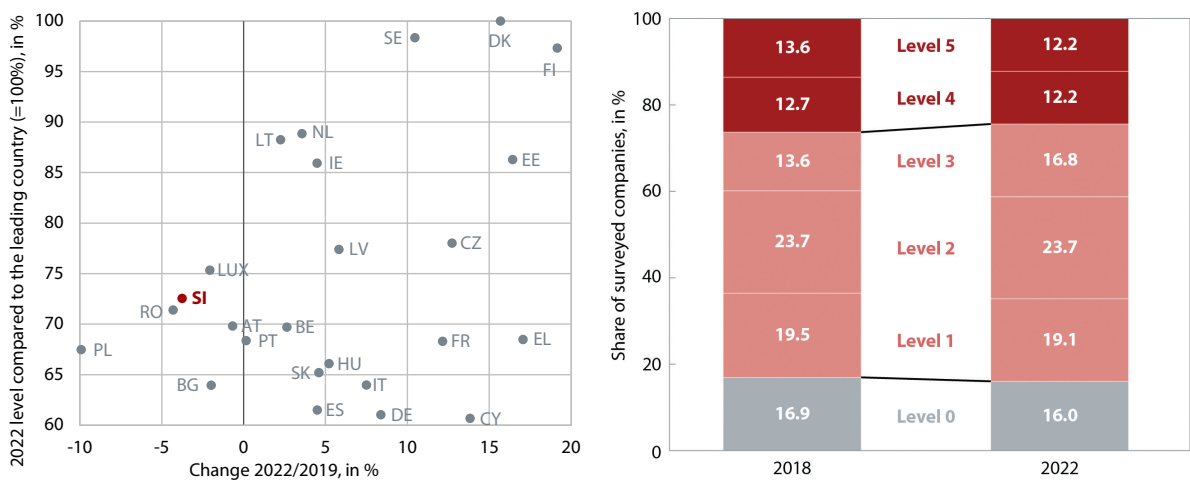
¹¹⁸ Slovenian SMEs also lag behind enterprises from Visegrad countries on average when it comes to the use of mass data. Preliminary data from the EMS (Palčič and Kovič, 2022) also show that “software for complex computational operations, simulations and data analysis using supercomputers (high performance edge computing) is used by only 8% of the surveyed companies, of which 2% of companies use it to a large extent”.

¹¹⁹ Preliminary data from the EMS (Palčič and Kovič, 2022) show, for example, that 52% of companies produce products with medium complexity, with innovation being identified as a key competitive factor (among the six possible ones) by only 10% of the surveyed companies (other criteria are price, quality, customisation, short delivery times and services). Preliminary results from the European Innovation Survey 2020 (Eurostat, 2022b) show a slightly more mixed picture, but this seems less consistent, as companies could also select several conflicting criteria at the same time. Slovenia is reportedly the leader among the 21 EU Member States with available data in terms of companies’ focus on “entirely new products and services” (a criterion identified as very important), while ranking fourth in terms of focus on “improvements to existing products and services”. It is also second in terms of “customer-adapted solutions orientation” and “low price orientation” and eighth in terms of “focus on standard products and services”.

¹²⁰ The methodology was also changed in 2021. This is directly comparable between 2018 and 2020, when Slovenian companies were ranked eighth (IMAD, 2022b).

acceleration of online sales (SURS, 2022d), with a much smaller impact on the use of more sophisticated technologies or their integration, for example cloud technologies (ibid.).¹²¹ This is confirmed by the Slovenian Entrepreneurship Observatory's findings that the COVID-19 crisis had a very significant impact on digitalisation in only 15% of SMEs, where the effects of digitalisation are expected to be reflected most in "seamless teleworking", "better access to information" and "increased efficiency of business operations", and least in "differentiation of the company", "change in the company's culture" and "more effective integration into supply chains" (Rebernik and Bradač Hojnik, 2022).

Figure 30: No progress is noted in the digital transformation and Industry 4.0 readiness of Slovenian companies



Source: IMD (2022a), calculation by IMAD; Palčič and Kovič (2022), presentation by IMAD. Note: The levels in the figure on the right refer to Industry 4.0¹²² readiness; for a more detailed description, see IMAD (2020).

To accelerate productivity growth, Slovenian companies will not only need to accelerate the adoption of specific (more sophisticated) technologies, but will need to tackle (digital) transformation in a more comprehensive and ambitious way, both in terms of digitalisation and sustainability and in terms of strengthening organisational factors, with a stronger focus on disruption, creativity and innovation. Transforming production and business requires a holistic and systematic approach (IMAD, 2020; Zech et al., 2020), also moving beyond established practices and habits (Škerlavaj, 2018). This is not only about technological modernisation in the sense of digitalisation and sustainability, but also about complementary processes linked to the strengthening of organisational factors in companies. These are also crucial for innovation activity, and although this link has been empirically confirmed also for Slovenian companies (Štrukelj et al., 2020) corporate social responsibility and business ethics requires various types of contemporary organisations innovation. This research assesses the problem related to business policy innovation (BPI, this factor remains underestimated. This is

¹²¹ For example, 48% of companies with more than 10 employees (98% of large companies) increased the number of video meetings using digital tools since the start of the COVID-19 crisis, while only 5% of companies (17% of large companies) started using or increased their use of cloud computing services (SURS, 2022d).

¹²² Level 0: non-users of technologies who are not ready for Industry 4.0, i.e. companies that still tend to use old, traditional technologies; levels 1–3 represent basic readiness for Industry 4.0, where companies use technologies from at least one, two or all three technology areas (digital management systems, wireless human–machine communication, cyber-physical production systems); levels 4 and 5 represent high readiness for Industry 4.0, where companies, in addition to using technologies from all three above areas at the same time, use at least two or all three technologies from the area of cyber-physical systems in manufacturing (digital data exchange with suppliers and customers, automated internal logistics systems, and real-time manufacturing control systems).

reflected in underinvestment in employee training and organisational capital¹²³ and too slow adaptation of organisational processes and company culture. These have a key impact, both directly and indirectly, on a range of factors related to transformation and, consequently, to productivity growth (Škerlavaj and Eržen, 2022):

- **Design management and design thinking**, where Slovenia has turned from one of the leaders to a mediocre investor (IMAD, 2022b).
- **Speed, flexibility and agility**, which are not only new competitive advantages (Reeves and Deimler, 2011), but are also closely linked to digital transformation (Zech et al., 2020); Slovenia is not among the EU leaders in these areas.¹²⁴
- **Openness, collaboration and trust** (Klassen Jamjoum et al., 2021), where Slovenian companies rank roughly in the middle of EU Member States in terms of the intensity of collaboration with organisations outside the company, according to the Community Innovation Survey.
- **Non-adapted organisational models of company operation** (Clark, 2022), where 40% of companies still operate on a “command and control” basis, which puts Slovenia around the EU average at 14th place (Eurofound, 2020).
- Insufficient focus on promoting **creativity, innovation** (Škerlavaj, 2018)¹²⁵ and **learning** (Reeves and Whitaker, 2018) and insufficient **focus on creating value** (Almquist et al., 2016) and on the **buyer** (Savič et al., 2016).

Lack of ambition in both digital and sustainable and organisational transformation is reflected in too slow upgrading of business models (see Section 4.2.1) and low rates of disruptive and breakthrough innovations (IMAD, 2022b). According to preliminary data from the EMS (Palčič and Kovič, 2022), of the 62% of companies that have launched new products since 2019, only 22% are new to the market, i.e. the company is in a leading provider role, while as many as 89% of companies report that they have products in their portfolio that they have been offering for more than 10 years.¹²⁶

Key reasons for the too slow progress at company level include an unsystematic approach to (digital) transformation, low awareness of its importance and impact, lack of human resources and skills, and a lack of willingness to change, while cost is also a major concern for small enterprises and a problem for medium and large enterprises with more sophisticated technologies. According to SURS, digital transformation is smoothly taking place only in around a quarter of companies (28%), with the proportion not varying significantly by company size. The reasons for the problems can be traced in three directions. First, companies are clearly not addressing digital transformation in a sufficiently comprehensive and systematic way, with only 17% of companies having a digital strategy for business transformation (14% of small enterprises, 29% of medium-sized enterprises and 48% of large enterprises). This is very likely due to the second reason, i.e. the extremely high proportion of companies that consider digital transformation neither essential nor relevant to their business success. This is still the case for as

¹²³ Slovenian companies are at the tail end of EU Member States in terms of investment in employee training and organisational capital (see Section 3.5.2).

¹²⁴ CorpoHub research (2021) shows that by 2019, slightly more than half of the companies surveyed had been introduced to the concept of agility, and most of these companies have started using the concept in the last five years. The main constraints to wider uptake are related to the lack of knowledge and experience with the concept and the reluctance of individual organisations to change.

¹²⁵ Preliminary data from the EMS (Palčič and Kovič, 2022) suggest that the situation for creativity and innovation might be changing, with 49% of the surveyed companies already training their employees in this area and 32% planning to do so by 2023.

¹²⁶ Of these, around half of the companies generated at least 50% of their revenues from them in 2021 and more than a quarter of the companies generated more than 75% of their revenues from them.

many as 48% of companies, a still high 19% of large enterprises and half (49%) and a third (33%) of small and medium-sized enterprises respectively. The third direction are problems occurring in the transformation process itself. It is generally agreed that the key problem for small enterprises is a lack of financial resources, while for all other enterprises (and this also applies to small ones) the key problem is a lack of adequate staff and skills, followed by a lack of ability to “adapt quickly to changes in the environment”. However, it should be noted that the adoption of more sophisticated technologies is even more difficult, with only 6% of companies (12% of large enterprises) reportedly considering the possibility of adopting AI. Of these, in all size classes of companies, between half and three-quarters have problems with cost overruns and staffing, with additional problems regarding compatibility with existing software and data unavailability.

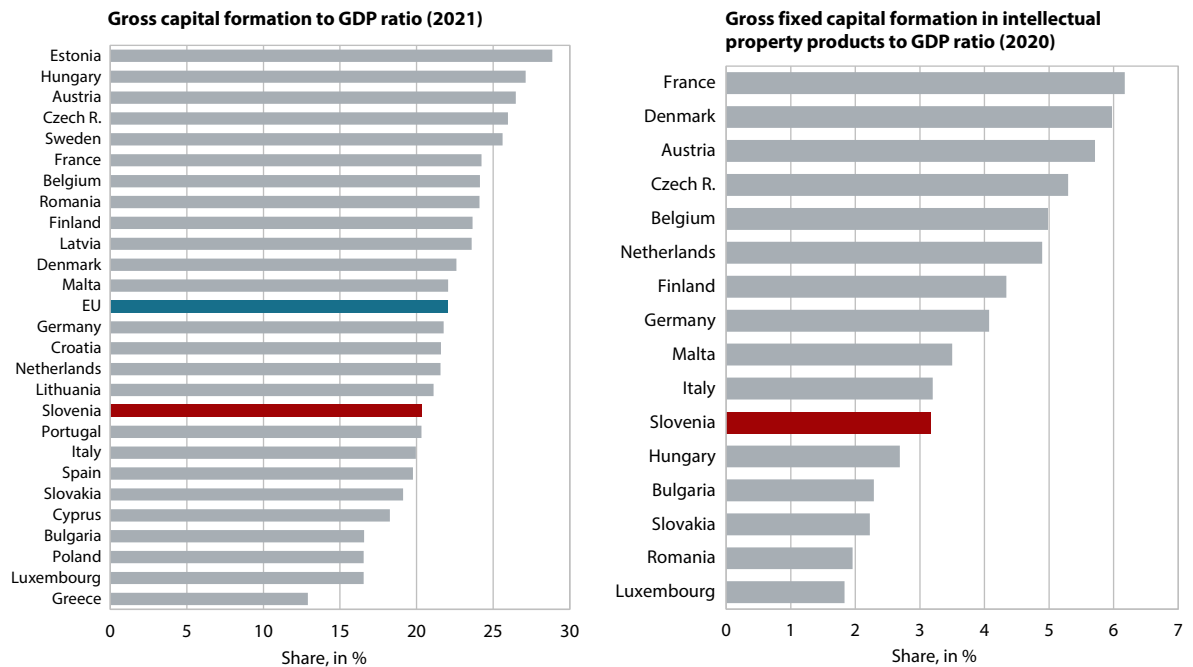
3.5 Investment

Fixed capital investment increases capital (tangible and intangible) and thus enables higher labour productivity. Investment in R&D and innovation, digitalisation, and modernisation of production and the economy is key to the transition to innovation-led growth, but this is increasingly true also for investment in the soft factors of intangible capital, from investment in organisational capital or business process improvement to investment in education and training.

3.5.1 Fixed capital investment

Capital growth in Slovenia has decreased significantly since 2008, with a low investment-to-GDP ratio by international comparison. The ratio of investment to gross domestic product was relatively high in the 2004–2008 period, ranging from 26% to 29%, which was to a large extent due to intensive motorway construction. This ratio decreased after the global financial crisis, mainly due to banking sector problems, deleveraging of companies and deteriorated expectations, and stagnated at around 19% after 2011 due to relatively low demand and high uncertainty. Under the influence of the EU funding cycle, the ratio declined in 2016 after a transitory increase in 2014 and 2015, before strengthening slightly in the following years. Investment then fluctuated sharply again during the COVID-19 epidemic. In the first year of the epidemic, as a share of GDP, it fell again under the impact of uncertainty and worsening expectations before rising sharply in 2021, mainly due to higher investment in equipment. The ratio of investment to gross domestic product amounted to 20% in Slovenia, which is still in the bottom half of EU Member States (with particularly low investment in buildings and structures).

Figure 31: The overall level of investment in Slovenia is low, with investment in intellectual property products also below average



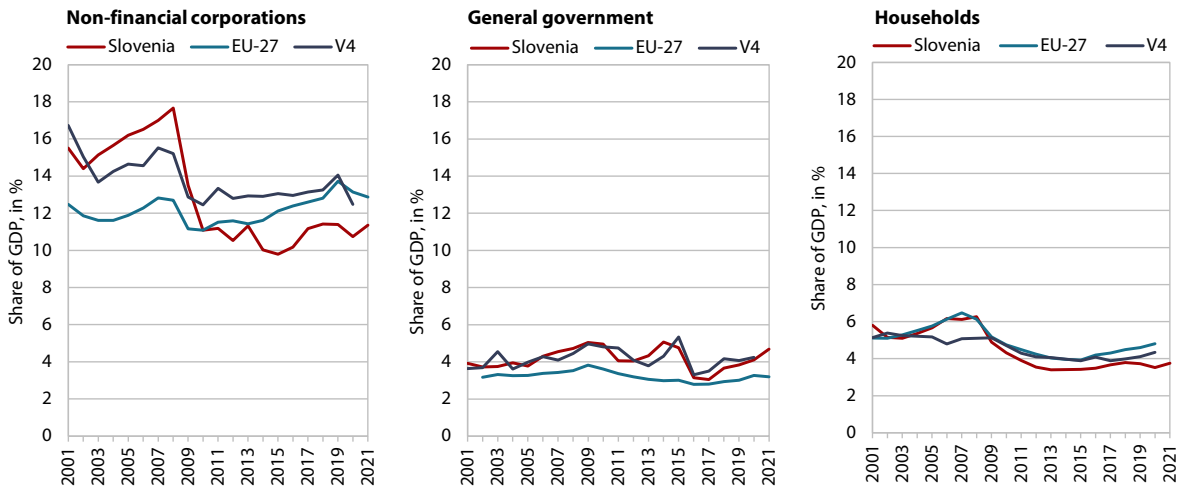
Source: Eurostat (2022c). Note: The figure on the right shows the EU Member States with available data

Low levels of investment are influenced significantly by low construction investment. Investment in buildings and structures has increased in the last few years, but its share in terms of GDP remains among the lowest in the EU. In this context, *investment in other buildings and structures* (civil engineering works such as roads and railways and all construction of non-residential buildings such as buildings for trade and service activities and industry) is at the average EU level but significantly lower than in other EU Member States with below-average development. *Investments in housing* accounts for just over 2% of GDP, making Slovenia one of the countries with the lowest shares in this regard.

Investment in equipment and machinery, which is significant from a productivity point of view, is relatively high, while investment in intellectual property creations is low. Slovenia is one of the EU Member States with an above-average ratio of investment in equipment and machinery to GDP. This is linked to a relatively high share of industry in the economy and many successful and profitable companies in this sector. The picture is less favourable when it comes to investment in intellectual property creations (e.g. computer software and databases, research and development), which represent one of the key productivity growth factors in modern economies. In Slovenia, investment in these creations lags behind the most advanced countries in this field, and the share of such investment is below the EU average.

In terms of investors, less investments in Slovenia are made by households and businesses and more by the state. In Slovenia, households invest less compared to the EU average, which is mainly linked to lower investment in housing. The ratio of corporate investment to GDP in Slovenia is also lower than the EU average; according to our assessment, this is mainly due to lower investment in intellectual property creations and partly due to lower investment in buildings and structures. The general government sector is investing more than the EU average, with a particularly significant increase in investment in 2021.

Figure 32: The sharp decline in business and population investment since the global financial crisis



Source: Eurostat (2022c). Note: V4 – Visegrad countries.

Companies point to the difficulty of finding suitable labour as a limiting factor for investment. According to an EIB survey (EIB, 2019), 85% of Slovenian companies pointed to staff with the right skills as a limiting factor for investment in 2019. At the outbreak of the epidemic, companies most frequently mentioned uncertainty about the future (EIB, 2021), but with the economic recovery in 2021, “staff with the right skills” was again at the top of the limiting factors, and energy costs (which were not ranked extremely high by companies, but the survey was made before the 2022 energy price hikes) were also considered a major constraint for companies.

3.5.2

Investment in innovation-led growth

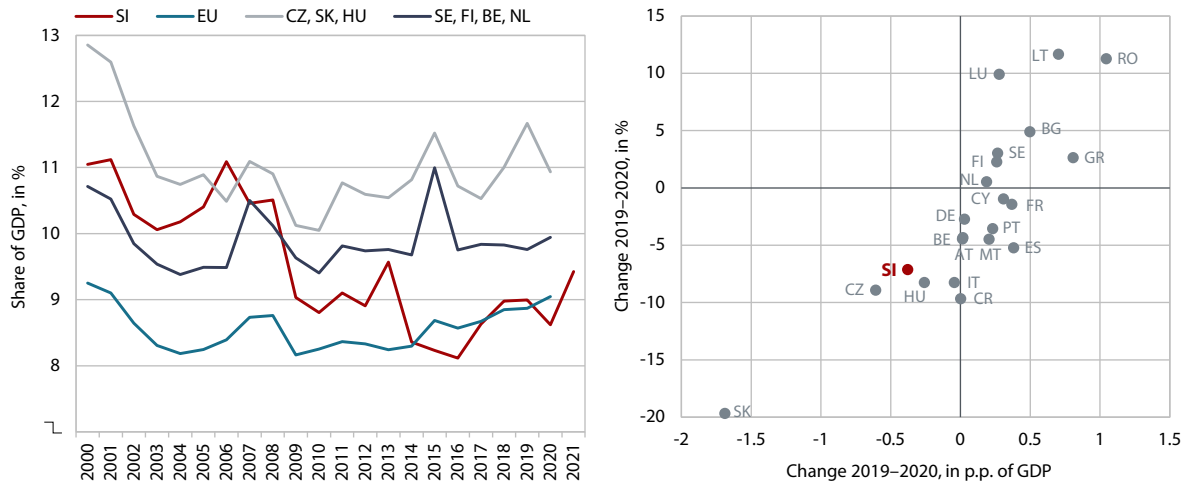
Slovenia’s investment in innovation-led growth (in R&D, ICT, and other machinery and equipment) **has declined sharply since the global financial crisis, meaning that although the trend has reversed in recent years, the gap is still large.** Before the onset of the global financial crisis in 2008, Slovenia invested 1.9 p.p. more than the EU average in R&D, ICT, and other machinery and equipment, but in the 2014–2020 period it lagged behind by 0.2 p.p. per year on average. In 2020, the gap increased to 0.4 p.p., followed by a marked improvement in 2021.¹²⁷ In the period 2000–2008, it spent on average 10.6% of GDP on these types of investment, against 9.4% of GDP in 2021. It lags significantly behind the innovation leaders Sweden, Finland and Belgium¹²⁸ (2 p.p. of GDP in 2014–2020) and three Visegrad countries, the Czech Republic, Slovakia and Hungary (by 2.5 p.p. of GDP). (Figure 33, left). The impact of the COVID-19 crisis on GDP was very uneven across countries, so the change in 2020 is shown in percentage points of GDP and in nominal terms (Figure 33, right). Countries can be classified into three groups: the most progressive group contains those that have increased this investment in nominal and relative terms: Romania, Lithuania, Greece, Bulgaria and Luxembourg. The second group comprises countries that have reduced the nominal volume of investment but increased its relative share in GDP: Spain, Malta and Portugal. Slovenia, meanwhile, is in the group of countries, together with Slovakia, Hungary and the Czech

¹²⁷ The data for other countries for 2021 were not yet available at the time of drafting this document.

¹²⁸ For a description of data availability, see note under Figure 33.

Republic, with a marked decline in investment in relative and nominal terms in the crisis year 2020; the starting point for the other countries in this group, however, was significantly higher than for Slovenia (Figure 33, left).

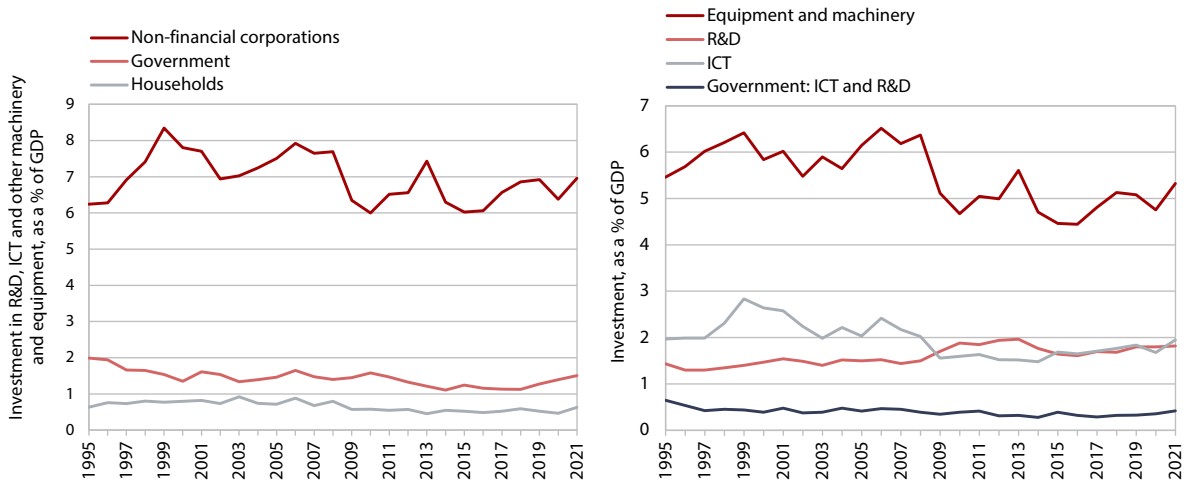
Figure 33: Total investment in R&D, ICT, and other machinery and equipment of around the EU average means a continuing gap with both the innovation leaders and the Visegrad countries



Source: Eurostat (2022c); calculation by IMAD. Note: Due to incomplete data for Poland, the figure on the left presents data for the other three Visegrad countries; for the same reason, Denmark is not among the innovation leaders. The EU figure, calculated as a weighted average based on GDP, also excludes Latvia (due to incomplete data) and Ireland, due to large fluctuations in investment volumes in recent years. The figure on the right shows the change in total investment between 2019 and 2020, expressed in terms of p.p. of GDP and in % (% change in current prices).

Non-financial corporations contributed a percentage point of GDP to the decline in investment in R&D, ICT, and other machinery and equipment between 2000–2008 and 2014–2021, while government and households also reduced investment by around a quarter of a percentage point of GDP. Non-financial corporations reduced their investment from an average of 7.5% of GDP per year to 6.5% of GDP, while government investment fell from 1.5% to 1.2% of GDP. By type of investment, investment in other equipment and machinery and in ICT fell the most (mainly in non-financial corporations), while investment in research and development increased slightly. However, while government investment in R&D, which is key to smart transformation, and ICT has been growing since 2017, it has been largely stagnant over a longer period of time. With the increase in 2021, the nominal volume of total smart investment (R&D, ICT, other machinery and equipment) by non-financial corporations has returned to its 2019 level.

Figure 34: Investment in R&D, ICT, and other machinery and equipment were reduced over a longer period by investors from all sectors, mainly at the expense of investment in other machinery and equipment and ICT

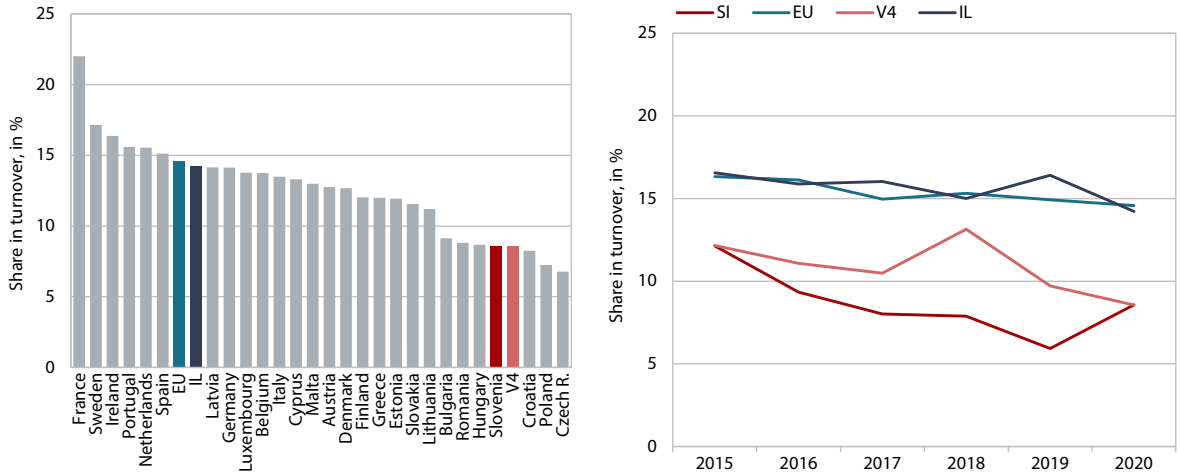


Source: SURS (2022d); calculations by IMAD.

When it comes to softer forms of intangible capital, Slovenia ranks among the most successful in investing in design and branding, while it is at the tail end of EU Member States in investment in training of employees and organisation and business process improvements. While data on investment in design and branding is only available up to 2017, it shows a positive picture, with Slovenia ranking 4th among the 17 EU Member States for which data is available. The investment in branding is high, but investment in design lags far behind the innovation leaders, and the gap between the two is widening (IMAD, 2022b). At the same time, Slovenia, at least according to the EIB survey (2022), is lagging far behind in terms of business investment in training of employees¹²⁹ and in organisation and business process improvements. These are the areas in which Slovenian companies invested the least among all EU Member States in 2019, though they overtook the Czech Republic, Poland and Croatia in 2020 (Figure 35). Compared to the innovation leaders and the EU average, Slovenian companies invest 5 to 6 percentage points less of their revenues in such transformation.

¹²⁹ Slovenia scores above the EU average in terms of both the share of enterprises enrolling their employees in continuing vocational education and training (Eurostat) and the share of employees included in work-related non-formal education and training (Eurofound). This could be due to the lower intensity of education and training (Slovenia excels in education and training lasting a day or less, while it lags behind in terms of longer courses) or to the lower costs of education and training per person employed (this was the case in 2020 and 2010 but not in 2015, when, according to Eurostat data, the cost of education and training for these purposes in Slovenia was one of the highest in the EU, taking purchasing power into account).

Figure 35: Slovenian companies pay significantly too little attention to investing in training of employees and in organisation and business process improvements



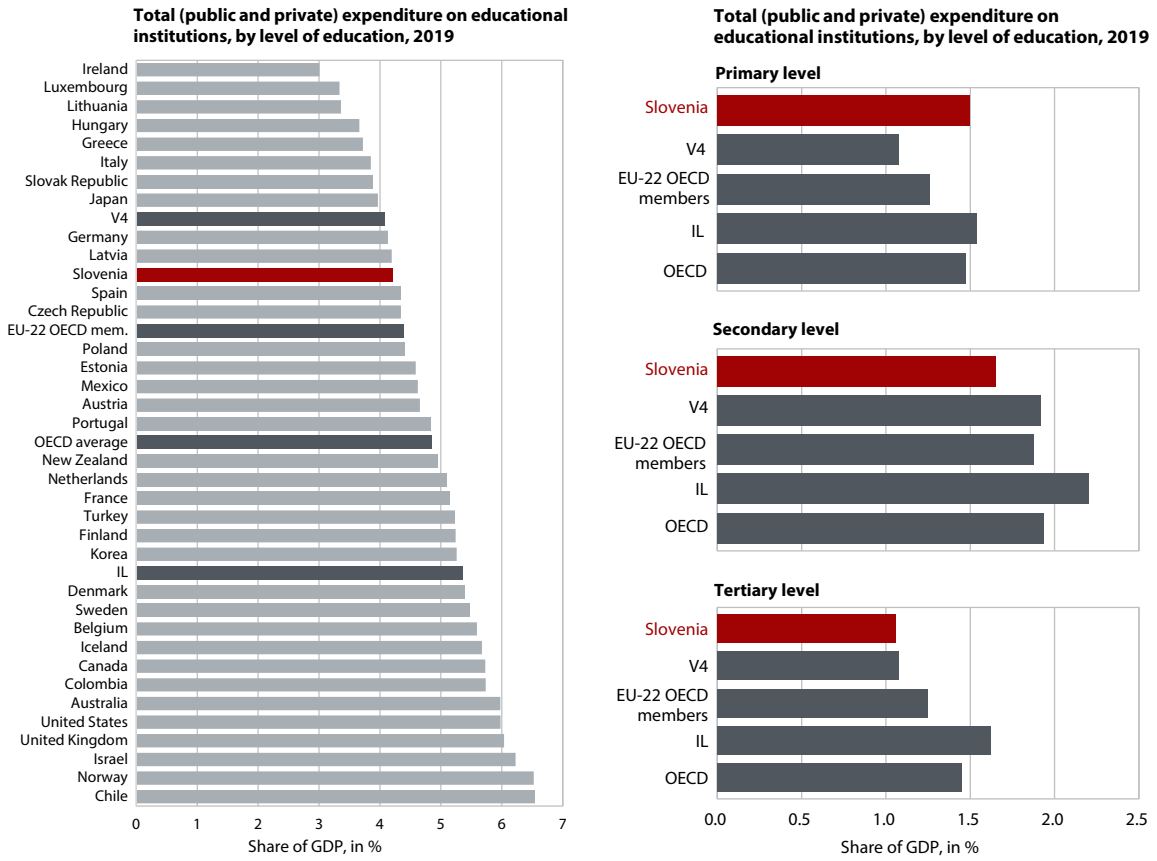
Source: EIB (2022); calculations by IMAD. Note: the figures show investment in training and in improving the organisation and business processes together, as a share of companies' revenues. IL – innovation leaders; V4 – Visegrad countries.

Slovenia is in the bottom half of EU Member States when it comes to investment in education and even further behind OECD countries, especially when it comes to investment at tertiary and secondary levels. According to the OECD, Slovenia's total public and private spending on education accounted for 4.2% of GDP in 2019, ranking Slovenia 13th among the 22 EU Member States that are members of the OECD and 26th among the 36 OECD countries. Total investment in education lags behind the EU's innovation leaders at 1.2% of GDP, with 7 non-European OECD members investing more in education than the EU's innovation leaders. While Slovenia invests more than the EU average and the same as the innovation leaders at the primary education level,¹³⁰ the gap at the secondary¹³¹ and tertiary levels rises to 0.2% and 0.6% of GDP respectively compared to the EU and the innovation leaders.

¹³⁰ The primary education level in Slovenia includes the first two triads of primary education.

¹³¹ The secondary education level in Slovenia includes the last triad of primary education and secondary education.

Figure 36: Without accelerated investment in education, Slovenia will not be able to maintain its competitive edge in knowledge



Source: OECD (2022a); calculations by IMAD. Note: V4 – Visegrad countries.

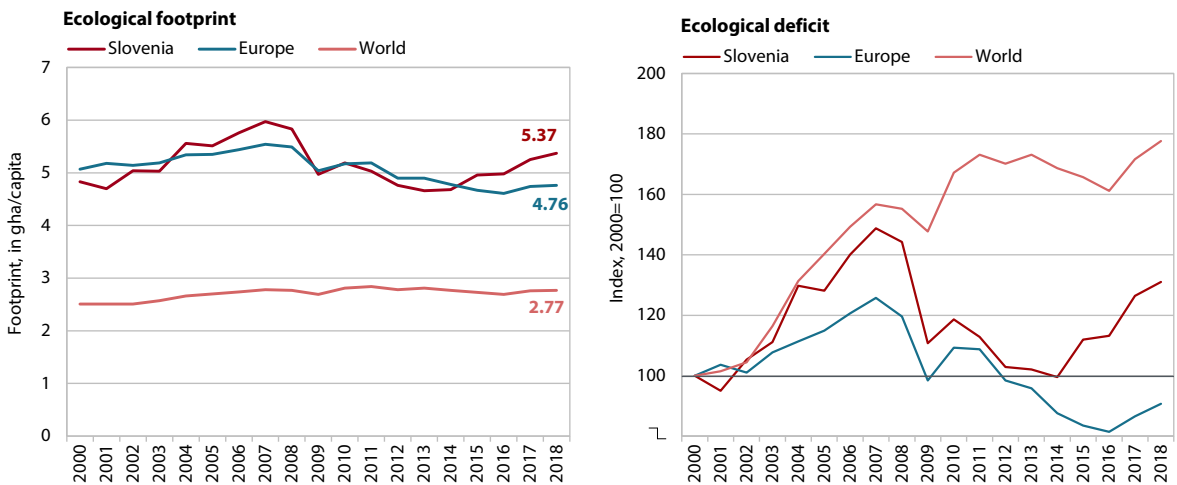
4 Productivity and competitiveness under the impact of transition to a low carbon and circular economy

4.1 Global trends with local effects

4.1.1. Environmental crisis and the necessity of transition

There is a growing awareness of the need to preserve the natural environment and ensure sustainable use of the limited natural resources that are a prerequisite for survival and development, but the results of efforts made so far have been rather modest. The Agenda for Sustainable Development (UN, 2015) was a milestone in sustainable development planning, balancing the economic, environmental and social dimensions of development, intertwined through 17 fundamental goals.¹³² An interim assessment showed that global efforts to achieve sustainable growth have been insufficient and that environmental degradation has not improved (UN, 2022). Current production methods and lifestyles are putting a strain on the natural environment worldwide and even more so in Europe, including in Slovenia, aggravating the environmental crisis. Since the fertile land needed to meet food demand, maintain our current lifestyle and dispose of the resulting waste (the ecological footprint) far exceeds biocapacity, decisive shifts are necessary in view of our planet’s limited capacities (Global Footprint Network, 2021). The imbalance between footprint and biocapacity (the ecological deficit), which stopped increasing during the global economic crisis, has increased again, faster in Slovenia than in the EU as a whole.¹³³ Unsustainable development is a major reason for increasing climate change and other related environmental problems (IPCC, 2021).

Figure 37: As burden on the environment increases, so does the ecological deficit in the world; in 2014–2018, it again increased relatively rapidly including in Slovenia; development is currently unsustainable and is leading to an environmental crisis



Source: Global Footprint Network (2022).

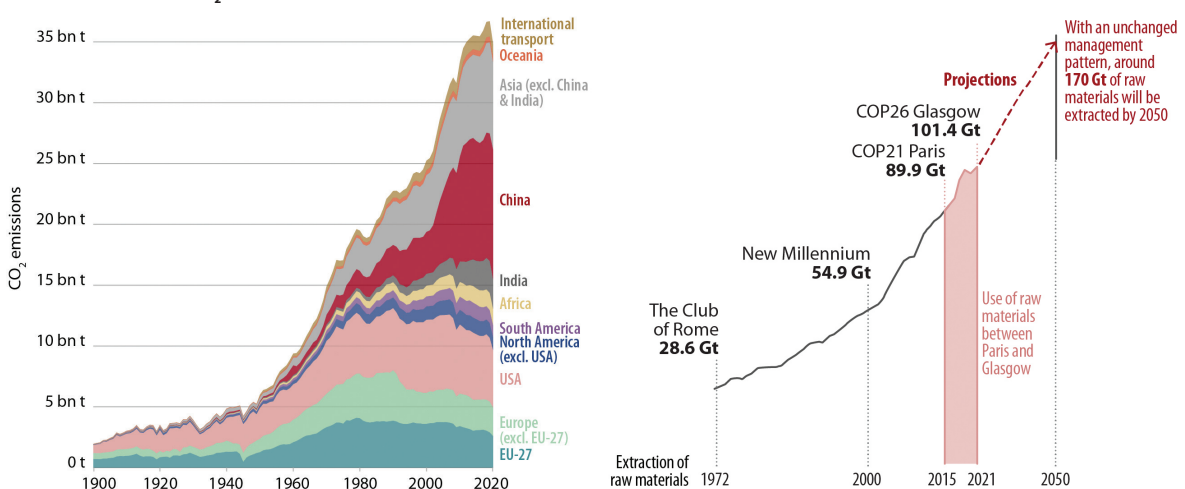
¹³² The Sustainable Development Goals are measurable and their realisation is monitored with 169 indicators.

¹³³ For more about the ecological footprint and deficit see, Development report 2022, pp. 105 and 106, and Indicator 4.8 (IMAD, 2022c).

Climate change and the associated periods of extreme heat, floods and droughts, water scarcity, and wildfires will have a significant impact on national economies. Without slowing it down and making adjustments, the consequences will be enormous in many areas, including human health and labour productivity. This is one of the reasons why we need to step up our efforts to achieve climate neutrality. The greatest changes will have to occur in sectors that are highly exposed to weather conditions, such as agriculture, forestry, energy, construction and tourism (Kjellstrom et al., 2008; Schleyen et al., 2022; WEF, 2021). To achieve the necessary changes, we need to develop and introduce innovative technological breakthroughs, modernise infrastructure, and promote sustainable entrepreneurship, which requires targeted support (EC, 2019). Climate and environmental challenges must be turned into opportunities and the transition to climate neutrality must be fair, which means that support should be provided to those areas and groups that will face the greatest socio-economic challenges.

Since we need to protect the environment and take into account that natural resources are finite, we need to decouple economic growth from the growth of greenhouse gas emissions and the use of natural resources, i.e. move from a linear to a circular management model. The transition to a circular economy is a prerequisite not only to achieve climate neutrality, but also to stop the growing over-consumption of natural resources, their expected scarcity and the associated price increase. To achieve the EU's goal of doubling its circular material use rate by 2030 (EC, 2020d),¹³⁴ we need to promote circular economy processes. In addition to urgent measures in the corporate sector, we need to promote sustainable consumption and longer product life and avoid the generation of waste. This is especially true for the most material-intensive sectors with a high potential for circularity, such as electronics, battery and vehicle manufacturing, packaging, plastics, textiles, construction, and food production (EC, 2020d). As the world's consumption of limited natural resources – minerals, ores, fossil fuels and biomass – rapidly increases, waste disposal is also becoming an increasing problem. The consumption of raw materials in the world has more than tripled since 1970 (International Resource Panel, 2019), and more than 90% of materials are discarded after use (Circle Economy, 2022).

Figure 38: Global CO₂ emissions (left) and raw material extraction (right) continue to rise sharply



Source: Adapted from Ritchie et al. (2021) and Circle Economy (2022). Note: the graph on the right is illustrative and the distances are not directly proportional to the marked values.

¹³⁴ Circular material use is measured by the proportion of material that is fed back into the economy, i.e. the ratio between the amount of processed waste used and the total amount of material used – see Figure 49.

In view of the growing awareness that green social change and green economy transition must take place as early as possible, legally binding agreements have been reached at global and EU levels. At COP26¹³⁵ at the end of 2021, it was agreed to reduce GHG emissions by 45% by 2030 compared to 2010 levels in order to limit the global temperature increase to 1.5°C above pre-industrial levels (UNFCCC, 2022).¹³⁶ Before that, the EU adopted the Green Deal (EC, 2019) to ensure the transition to a low-carbon, circular and resource-efficient economy. On the path to climate neutrality by 2050 (EP, 2021), the EU has set an interim target of reducing GHG emissions by at least 55% by 2030 as part of the Fit for 55 package (EC, 2021c).¹³⁷ The package concerns the following: (i) GHG emissions, where changes to the existing EU's emissions trading system (ETS)¹³⁸ should result in an overall emission reduction in the sectors concerned of 61% by 2030 compared with 2005, with the scope extended by including aviation and maritime transport; emissions in non-ETS sectors should be reduced by 40%; (ii) enhancement of natural carbon sinks; (iii) RES energy, the share of which should increase to at least 40%; (iv) increasing energy efficiency by reducing final energy consumption by 36% and primary energy consumption by 39%; (v) energy taxation in line with climate and environmental targets; (vi) efforts to increase the use of alternative fuels and the number of charging stations for electric vehicles; (vii) just transition, i.e. helping the areas most affected by the transition; and (viii) carbon border adjustment, which will prevent the offshoring of production from the EU to countries that are less ambitious in reducing emissions, or replacement of products with imported products that are more carbon intensive.

According to the adopted strategic targets in the National Energy and Climate Plan (NECP), GHG emissions in Slovenia are to be reduced by about one-third by 2030 and completely eliminated by 2050, but the national targets will have to be revised upwards due to the more ambitious EU targets. GHG emissions reduction targets to 2030 are set out in the Integrated National Energy and Climate Plan (NECP) (Government of the RS, 2020) and the longer-term ones, to 2050, in the Resolution on Long-Term Climate Strategy (ReDPS50, 2021). The targets include the following: (i) reducing GHG emissions by at least 20% in non-ETS sectors, reducing total emissions by at least 36% compared to 2005; (ii) increasing the share of RES in final energy consumption to at least 27%; and (iii) improving energy efficiency by at least 35% compared to the 2007 baseline scenario. The 2030 targets set in the NECP need to be revised upwards in line with the new EU targets. In order to accelerate progress, additional possibilities will have to be analysed across sectors and appropriate additional measures agreed upon. The strategic goal set in the ReDPS50 is to achieve climate neutrality, i.e. net zero emissions, taking sinks into

¹³⁵ Meeting of the United Nations Framework Convention on Climate Change in Glasgow, attended by 197 countries.

¹³⁶ It was stressed that we need to accelerate the decarbonisation of the energy sector and shift to clean and sustainable modes of transport through the development of zero-emission technologies, while adapting and promoting specific resilience-building actions. This was the first time that the phase-out of coal-fired thermal power plants and the elimination of fossil fuel subsidies had been addressed. These commitments will have a significant impact on energy, transport and several industrial sectors and on financing and consumption (The Economist Intelligence Unit, 2021).

¹³⁷ For more on this topic, see Development report 2022, p. 96, Box 10 (IMAD, 2022c).

¹³⁸ The greenhouse gas emissions trading scheme (EU ETS) was set up in the EU with the aim of achieving the Paris Agreement targets on emission abatement. The EU ETS is a system of emission allowances trading, the price of which is determined freely on the market. ETS-sectors are electricity and heat production and industrial processes (e.g. oil refineries, iron and steel plants, and manufacture of cement). To reduce emissions, the cap-and-trade system is used to set a cap on how much greenhouse gas pollution can be emitted from the ETS system each year. This cap has decreased over the years, and so have emissions. The cap is expressed by the total annual quantity of EUA (European Union Allowances). Companies can buy allowances by auction or trade them on the market. This determines the price for greenhouse gas emissions, which encourages companies to reduce emissions in the long term.

account, by 2050. Total emissions are expected to fall by 80–90% from 2005 levels by 2050 and by as much as 90–99% in the transport and energy sectors.

4.1.2

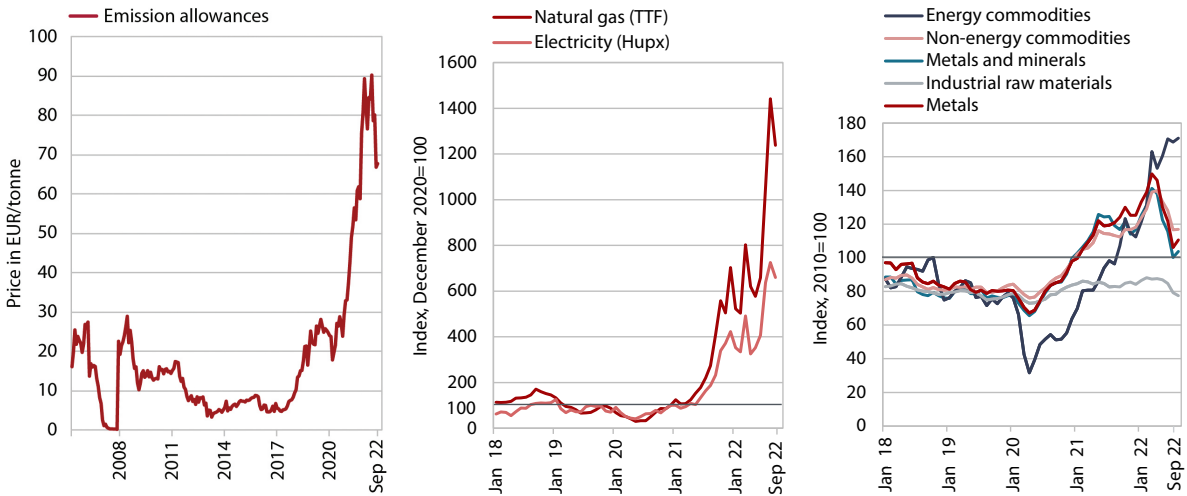
Consequences at the macro level

The long-term impact of the green transition on overall economic activity is not expected to be large, but there will be a significant structural redistribution between activities. That the benefits of strong and early action against climate change outweigh the economic costs of not acting was already stated in the Stern Review (2006). According to this first large-scale analysis, measures to combat climate change and mitigate global warming would cost around 1% of global GDP each year, while inaction would cost between 5% and 20% of global GDP. It was highlighted that the relatively small necessary investments in a low-carbon circular economy would lead to greater energy security and lower other damage, but also that policies are needed to support the development of low-carbon and high-efficiency technologies. Recent analyses have also shown that the overall impact of climate change mitigation on both economic activity and employment will be relatively modest (EC, 2018, 2020d; Varga et al., 2021). Varga et al. (2021) estimated that as a result of carbon neutrality efforts, the total EU GDP will decrease by 0.6 to 0.9% by 2050, depending mainly on the amount of the carbon tax and the purpose for which the tax revenue is used. Due to the current delay, the transition will have to be accelerated in the coming years, and rapid and comprehensive changes will alter the existing structure of the economy. As the challenges of the green transition will be greatest for polluting activities, these will also suffer the greatest and fastest decline. The opposite is true for activities that cause less pollution and especially for activities that contribute to the improvement of the environment. These will also open up new opportunities for relatively rapid development and job creation.

Emission-intensive sectors included in the EU emissions trading scheme (EU ETS) are strongly encouraged to find greener solutions by rising allowance prices, material- and energy-intensive ones by rising prices of raw materials and energy. As most GHG emissions come from the energy, transport and buildings sectors, these are also the areas where changes will be most profound. Some of the most important measures in the future will be inclusion of new sectors in EU ETS,¹³⁹ phasing-out of free allowances and their elimination by 2035, promotion of renewable energy and energy efficiency, and a faster roll-out of low-emission transport modes and the related infrastructure. As emissions reductions achieved during the COVID-19 pandemic could be short-lived without radical systemic changes (UNEP, 2021), changing the energy taxation system and eliminating all exemptions and incentives that do not contribute to emissions reduction targets will be important for long-term success (IJS-CEU, 2021; Government of the RS, 2020). Given the instability in international markets, the rapid increase of energy and raw material prices, and the supply chain disruptions, it will also be necessary to enhance circularity and resource efficiency and thus reduce production costs. As prices of primary raw materials are expected to continue to rise, while prices of secondary raw materials are expected to decrease in the long term (OECD, 2019b), increased processing and decoupling of economic growth from the use of primary resources will also reduce associated operating costs and dependence on raw materials (UN, 2019).

¹³⁹ Air, waterborne and road transport will also be included in the EU emissions trading system.

Figure 39: A faster transition to a low-carbon circular economy is also dictated by the rising costs associated with the rising prices of allowances, energy and raw materials



Sources: Tradingeconomics.com (2022), Investing.com (2022), HUPX (2022), World Bank (2022).

Most analyses of the consequences of the transition¹⁴⁰ focus specifically on those activities that contribute most to climate change and where the changes will be most radical. Among these are energy, mining, energy-intensive industry, construction and agriculture. In the energy sector, the changes will be associated with severely limiting fossil fuel extraction and use. The demand for alternative fuels will increase and therefore the industry must focus on development, production and distribution of such fuels. The mining sector will be faced with coal mine closures, while the extraction of minerals and raw materials will become increasingly important. In energy-intensive industries, dependence on fossil fuels must be replaced by the use of renewable resources, while energy efficiency should be increased through investment in new technologies and the use of primary, particularly critical raw materials should be reduced through increased recycling and the use of secondary raw materials.¹⁴¹ Reuse of raw materials and raising energy efficiency will also be very important in the construction industry. Businesses will need to internalise the risks of climate change, adapt their key strategies to take advantage of opportunities as they arise and prepare for changing economic conditions with green investments. Due to the transition to a carbon-free economy, only the best prepared and most creative businesses with a high level of expertise will thrive in the long run; all others run the risk of being left behind (EIB, 2021).

As agriculture, which is extremely vulnerable to climate change, faces some of the greatest challenges, which may lead to a food crisis, special attention is paid to this sector. The increasing frequency of extreme weather events and rising input prices are driving up food prices and constitute a threat to food stability and security. In response to this problem, the greening of agricultural policy is being promoted in accordance with the Green Deal. Measures to support resource-efficient agricultural practices have a positive impact on the climate and the quality of natural resources, while reducing agriculture’s vulnerability to rising energy prices. The transition to sustainable food systems represents a great opportunity in economic terms, as

¹⁴⁰ E.g. Sectoral impacts of climate mitigation and possible adjustment frictions (EC, 2022o); 2022 Strategic Foresight Report (EC, 2022i); Towards a Green and Digital Future (Muench et al., 2022b); The State of Climate Tech 2020 (PWC, 2021b); OECD-FAO Agricultural Outlook 2022–2031 (OECD and FAO, 2022).

¹⁴¹ Around 30 materials are included in the EU’s list of critical raw materials. The list grows longer quickly: in 2020, for example, lithium, which is essential to the transition towards e-mobility, was placed on the list.

innovation and the development of new technologies, combined with increased public awareness and demand for sustainably produced food, benefit all links in the food chain (EC, 2020e). The green transition is also an opportunity for generational renewal in agriculture, which can create new jobs while contributing to the necessary restructuring of activities by business-oriented young farmers who are motivated to introduce technological, production, organisational and marketing changes.

The green transition is not expected to have a significant impact on total employment, but due to the redistribution of activities, the structure of jobs will change. The green transition will eliminate jobs in polluting sectors and at the same time open up opportunities for new green jobs that will require entirely new skills (EC, 2020c).¹⁴² The change of demand for formal education is expected to be dual: as some new jobs will require higher education and training, the demand for highly skilled workers will increase (e.g. in the energy industry or in highly productive sectors), while other jobs will only involve “green tasks”, for which less demanding retraining will suffice (e.g. in construction or waste management) (Popp et al. 2020). Particular attention must be paid to tackling job losses that are geographically concentrated (e.g. in coal mining regions), as new jobs are not necessarily created in areas where old ones are lost. To address the challenges in the most vulnerable areas, which will face particularly severe socio-economic problems during the transition, support will be provided for the so-called just transition. The risk of job losses may also be related to carbon leakage, as stricter climate policies and related high carbon taxes could lead to production and jobs being offshored to areas with less ambitious climate policies and thus lower costs.

In times of highly volatile energy supply and prices, the transition to clean energy from local natural sources is very important, also to achieve greater energy security and independence, which is increasingly important in a changing geopolitical context. In 2021, the EU imported 90% of all the gas it consumed, with 45% coming from Russia.¹⁴³ It also imported about 25% of oil and 45% of coal from Russia (EC, 2022n). With disruptions in the global energy market due to unreliable supply and volatile fossil fuel prices, achieving greater energy independence has become a top priority. According to the REPowerEU plan, Europe should become independent from Russian fossil fuels well before 2030, thereby increasing the resilience of the energy system. If imports from non-Russian suppliers increase, fossil fuel consumption should decrease faster, while energy efficiency and the share of renewable energy in total energy consumption should increase (EC, 2022n). As securing energy supply will be extremely difficult in the meantime, there is a possibility that the use of fossil fuels, including of coal, will increase again to avoid disruptions. Addressing the current crisis is urgent, but as this is a step in an unsustainable direction, efforts in other areas contributing to the green transition need to be significantly strengthened.

Addressing the increased risk of energy poverty is a major challenge. However, aid should not neutralise the effect of price signals. Population groups where energy costs make up a significant share of the cost of living and businesses in energy-intensive sectors are more at risk. Given the expected longer-term challenges, incentives should lead to more effective system adjustments, in particular lower energy consumption or higher energy efficiency and higher use of renewable resources. Many countries have mitigated the impact of high energy prices that followed the recovery of the economy after the COVID-19 crisis and the impact of

¹⁴² Applying circular economy principles has the potential to create 700,000 new jobs across the EU by 2030, many of them in SMEs (EC, 2020c).

¹⁴³ The share was reduced to 15% by September 2022.

the changing conditions due to the war in Ukraine by offering significant support for the use of fossil fuels to protect households and businesses.¹⁴⁴ These measures are relatively easy to implement, but since they are not targeted, they weaken the general willingness to reduce energy consumption. Incentives in the form of financial aid and price caps can be very helpful, but this only makes sense in the case of short-term shocks (Bethuyne et al., 2022). Measures that blunt price signals to reduce fossil energy use should be phased out while building capacity to better address household vulnerability and accelerating the use of alternative sources of energy (Van Dender et al., 2022). This requires low-carbon investments, which are promoted through non-pricing instruments such as regulations, fiscal policy, and public support (Ari et al., 2022).

4.1.3

Opportunities at the company level

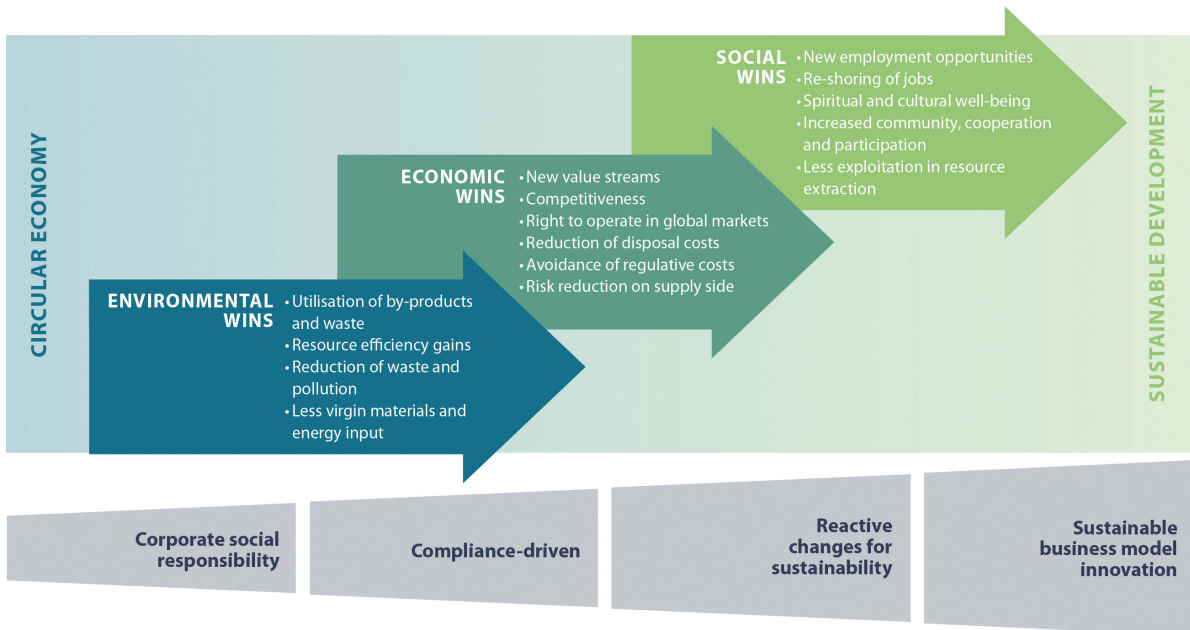
The transition to a low-carbon circular economy, which is associated with short-term cost challenges,¹⁴⁵ is also becoming a source of new competitive advantage for companies. While a decade ago sustainability at the corporate level was seen more as a niche concept and a function of public relations (WEF, 2022a), in recent years it has become a prerequisite for the success of business operations (Saenz et al., 2022) and a source of new competitive advantage (Geissdoerfer et al., 2018; WEF, 2022a). In order to maximise their returns in the medium and long term, companies need to also consider optimising operations from the point of view of creating broader economic and social benefits (Young and Reeves, 2020), reflected in compliance with ESG criteria.¹⁴⁶ Such approaches are not without their critics, however (for an overview, see The Economist, 2022a), and due to the exceptional circumstances related primarily to the war in Ukraine, there may be somewhat less attention paid to sustainability (and digitalisation) in the short term (IPSOS, 2022; Samandari et al., 2022; Wegner, 2022), while at the same time it does not seem likely that this effect will last or even that a trend reversal will occur (Davis-Peccoud et al., 2022; Gartner, 2022). This is supported not only by the need to take action in response to the environmental crisis, but also by other reasons, for example geostrategic ones, which could even accelerate the green transition process (EC, 2022i).

¹⁴⁴ According to an OECD survey (2021e) covering OECD countries, the G20 and 33 other major economies, support for the use of fossil fuels almost doubled in 2021, slowing progress towards the attainment of international climate targets.

¹⁴⁵ See Section 4.2.1.

¹⁴⁶ ESG – environmental, social and governance criteria.

Figure 40: The shift to a circular economy is urgent from an environmental perspective, but also from the perspective of competitiveness and social benefits, requiring companies to do more than just react and ensure compliance



Source: Adapted by IMAD from Montag et al. (2021) and Young and Reeves (2020).

Green transition of the corporate sector is also accelerated by legislation, and the pressure will increase in the coming period. The Green Deal and the Fit for 55 (2021) package will significantly change the business conditions for EU companies in the coming years. In addition to the more ambitious (macro)environmental targets and the expansion and tightening of the emissions trading system (see Section 4.1.1), a number of other laws are currently being passed or implemented that will also have an impact on business operations:

- In the area of reporting and consequently access to finance under the new EU taxonomy (EC, 2021a): sustainability reporting will become mandatory for all large companies and for listed SMEs,¹⁴⁷ but this type of reporting is very likely to prevail in access to all types of financing, as reporting and financing conditions for financial institutions will become much stricter.¹⁴⁸
- In February 2022, the EC proposed the Corporate Sustainability Due Diligence Directive (EC, 2022j), which is expected to improve corporate governance practices to better integrate risk management and mitigation processes of human rights and environmental risks and impacts, including those stemming from value chains, into corporate strategies.¹⁴⁹
- According to the proposed Regulation establishing a framework for setting ecodesign requirements for sustainable products (EC, 2022g), the requirements

¹⁴⁷ The provisions of the new Directive (EC, 2021b) are to apply from 2024 to companies already required to report under the Non-Financial Reporting Directive, i.e. entities with an average number of employees in excess of 500, and from 2025 to the remaining large companies (i.e. with more than 250 employees) and from 2026 to listed SMEs.

¹⁴⁸ Also in Slovenia, banks are, for example, already upgrading processes for evaluating clients and transactions (project finance, loans) with sustainable elements (Švab, 2022), as the Regulation on sustainability related disclosures in the financial services sector (EU, 2019) was to be fully implemented by 1 July 2022.

¹⁴⁹ According to the proposal, the Directive applies to companies with more than 500 employees or companies with at least 250 employees and a worldwide net turnover of more than EUR 40 million (subject to some additional restrictions).

regarding durability, reliability, reusability, upgradability and repairability of products on the EU market, product energy efficiency and recycled content of products¹⁵⁰ are to be extended and tightened, all products are to have their own digital passport in the future, and eco-design and energy efficiency labelling is to be strengthened.

- d) Changes are also expected within individual sectors, in the areas of textiles¹⁵¹ (e.g. by limiting the release of microplastics and avoiding fast fashion) and construction¹⁵² and also industrial emissions, eco-labelling of products, packaging regulations and the like.¹⁵³

At the same time, consumers, investors and employees increasingly expect a focus on sustainability, which will become an even more prevalent trend in the future, partly due to generational effects. As awareness of the importance of sustainability among consumers increases worldwide (EIU, 2021; WMF, 2021), Frame et al. (2022) describe winning the consumer with sustainability as “a short-term imperative and a long-term opportunity”. Although awareness of the importance of sustainability has so far only been reflected to a small extent in willingness to pay (Frame et al., 2022; Mackey, 2021), sustainability is becoming increasingly important in consumers’ purchasing decisions (Haller et al., 2020; Nielsen, 2015), especially in the context of the growing importance of sustainability-oriented brands, including in Slovenia,¹⁵⁴ which is even more pronounced after the COVID-19 crisis (Granskog et al., 2020; PWC, 2021a). A stronger orientation towards sustainability is also supported by generational effects, as younger generations are more sustainability-conscious (Frame et al., 2022; Granskog et al., 2020). Moreover, orientation towards sustainability also makes it easier for companies to access capital and increases their attractiveness for employees (Bar Am et al., 2022; Schear et al., 2022; Tilbury et al., 2022). All of this should, at least in the medium term and especially in case of early movers, also be reflected in economic performance in the form of higher company valuations (Morningstar, 2022; Tilbury et al., 2022), higher turnover (WEF, 2022b) and higher profitability (Samandari et al., 2022). The IMF also notes that employees in green jobs earn higher salaries (IMF, 2022). However, there are differing opinions on the existence of all the positive economic effects mentioned above and no consensus has yet been reached on this issue (*The Economist*, 2022b).

Companies should upgrade ESG or formal compliance with innovation of sustainable business models. Progress in corporate practice often fails to materialise, at least to the extent planned (Saenz et al., 2022), which may be due to too much focus on purely formal assurance of corporate compliance (Young and Reeves, 2020). It therefore makes more sense to understand ESG compliance as a tool that stimulates innovation for sustainable value creation with an ecosystemic and multi-level approach (Schear et al., 2022; Young and Reeves, 2020). This is the essence of sustainable business model innovation that can create long-term value for a broad range of stakeholders through constant transformation and diversification of the business model, which simultaneously strengthens their resilience (Geissdoerfer et al., 2018; Ritala et al., 2018; Shakeel et al., 2020).

¹⁵⁰ According to the proposal, manufacturers should carry out the conformity assessment procedure before placing a product on the market or putting it into service, which should be supported by appropriate technical documentation (Article 21).

¹⁵¹ EU Strategy for Sustainable and Circular Textiles (EC, 2022p).

¹⁵² Regulation laying down harmonised conditions for the marketing of construction products (EC, 2022k).

¹⁵³ For more, see https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en (EC, n.d.).

¹⁵⁴ In Slovenia, 49% of consumers consider ESG criteria important, 20% take them into account in their purchasing decisions, 12% see them as a reason to change their brand or supplier, while only 6% are willing to pay a price premium of more than 3% for products that meet ESG criteria (Chikova et al., 2022).

Box 2

Circular business models are considered the most demanding in terms of sustainability¹⁵⁵

According to Lacy and Rutqvist (2015), circular business models can be divided into the following categories (adapted from OECD (2019a)):

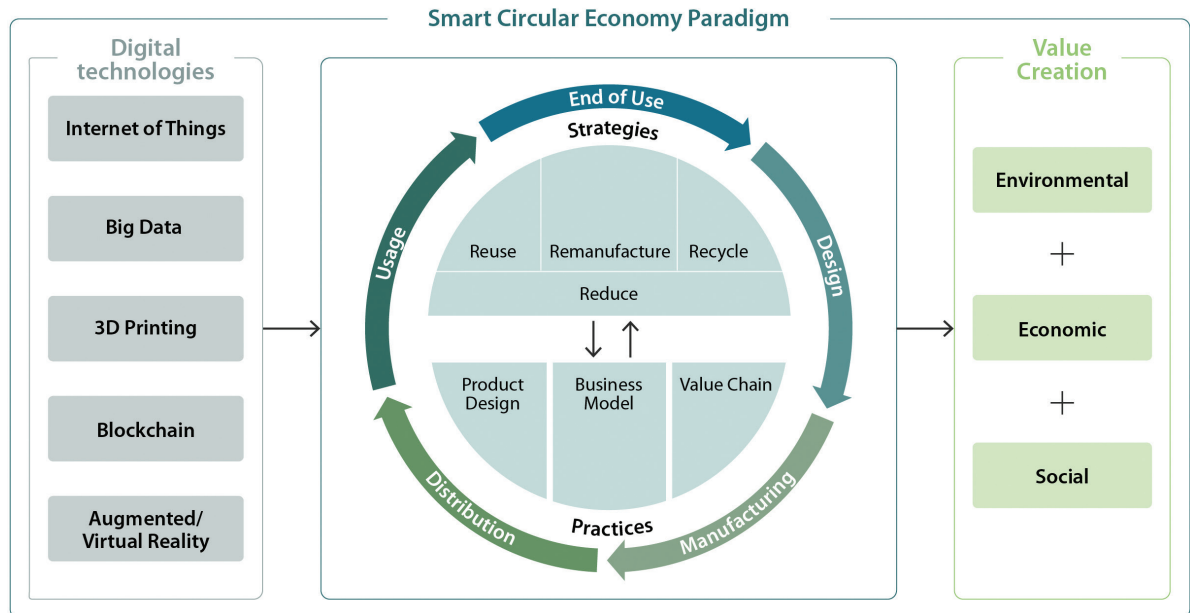
- a) **Circular supply chains** with a focus on the use of renewable and bio-based materials, also using concepts such as “cradle-to-cradle”, in accordance with the closed-loop material flow concept.
- b) **Reuse of resources** with a focus on the use of secondary raw materials from waste, also using concepts such as industrial symbiosis or re-/up-/down-cycling.
- c) **Product life cycle extension** with related concepts such as refill, reuse, repair, refurbish, upgrade, remarket or repurpose, and remanufacture.
- d) **Shared platforms** offering shared use or sometimes shared ownership.
- e) **Servitisation**, i.e. offering of products for use with retention of product ownership.

Circular business models relate to all dimensions of value chains, from procurement and logistics to production, product design, marketing and distribution (Bar Am et al., 2022). Key to their successful implementation are managing of *complexity* (Montag et al., 2021), transition to an *open, collaborative ecosystem approach* (Grabbe et al., 2022; Saenz et al., 2022; Zaluaga Martinez et al., 2021), and ensuring *traceability and transparency* (Götz et al., 2022; WEF, 2021; WMF, 2021), which is only possible through an accelerated use of *digital technologies*.

Sustainable and digital transformation complement each other, and this is the basis of an integrated, smart circular economy paradigm. The increasing interconnection between the domains of digitalisation and sustainability is not only something that is discussed amongst academics (Okorie et al., 2018) – positive effects are also being reported by company representatives (Anderson and Caimi, 2022; PWC, 2021a). Although digitalisation alone does not yet automatically lead to higher sustainability performance, a new paradigm of a smart and digital circular economy has recently emerged (Bressanelli et al., 2022; Hedberg et al., 2019). According to this paradigm, digitalisation is primarily a means for a systematic transformation of products, business models and value chains to enable the transition to a circular economy (Figure 41). From the point of view of strengthening (long-term) competitiveness and productivity, this should also be in the strategic interest of companies in Slovenia, although the integration of digitalisation and sustainability is still the exception rather than the rule in the world generally (Gartner, 2020).

¹⁵⁵ For conceptual differences, see Geissdoerfer et al. (2018).

Figure 41: Complementarity of digital and sustainable transformation in line with the smart circular economy paradigm



Source: Bressanelli et al. (2022)

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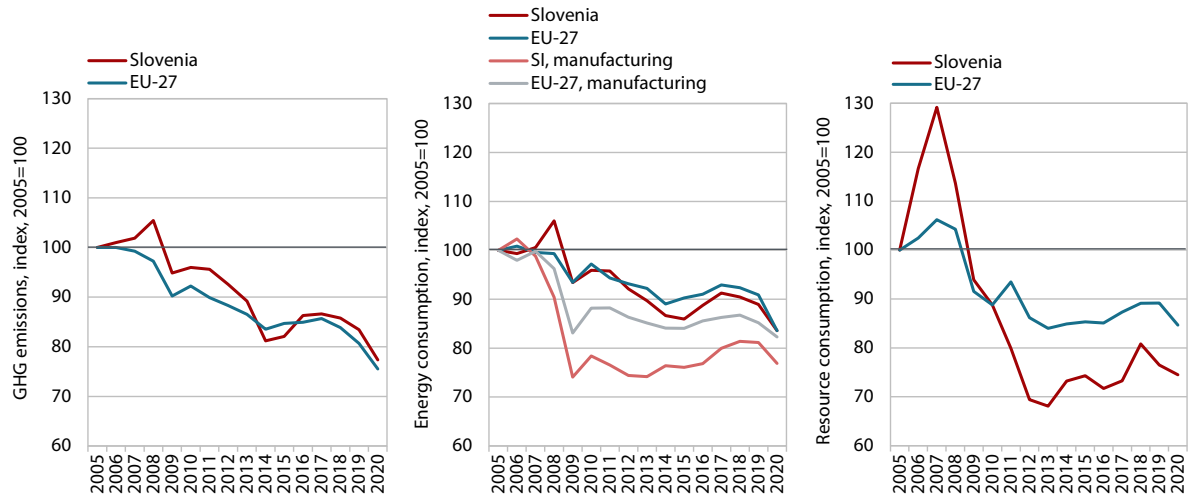
Green transition and Slovenia's resilience

4.2.1

Environmental dimension of economic development in Slovenia

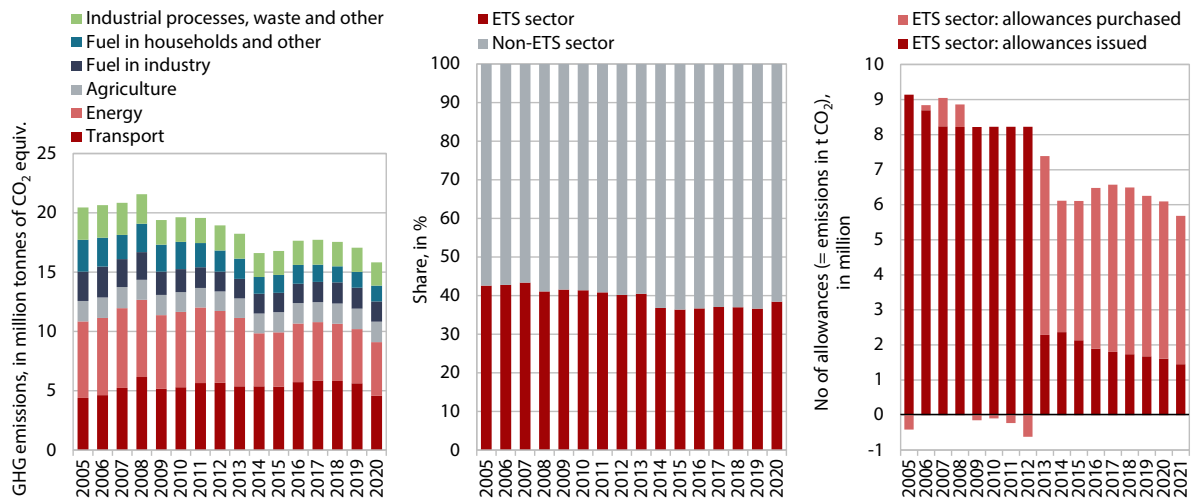
Total GHG emissions and energy and material consumption have declined over a long period of time and related environmental productivity has improved, but more decisive action is needed to narrow the gap with the EU average. Total GHG emissions were 23% lower in 2020, the last year for which data are available, than in 2005, when the EU ETS was introduced, and primary and final energy consumption were around 15% lower over the same period, both in line with the EU average. Lower consumption was mainly due to lower activity during the global financial crisis and later during the health crisis. The total consumption of materials declined more sharply during this period, mainly due to lower construction activity and the associated lower consumption of non-metallic minerals. Environmental productivity (measured as the ratio of economic growth to the resulting GHG emissions, energy consumption and material consumption), which allows us to analyse the core environmental dimension of economic development, has improved. The changes made were towards meeting the set targets, which were easier to achieve given the lower economic activity. The gap with the EU average has not narrowed significantly, however, with the exception of resource productivity.

Figure 42: The development of GHG emissions and energy consumption in Slovenia has been similar to the EU average in recent years, but the decline in resource consumption has been more pronounced



Source: Eurostat (2022c).

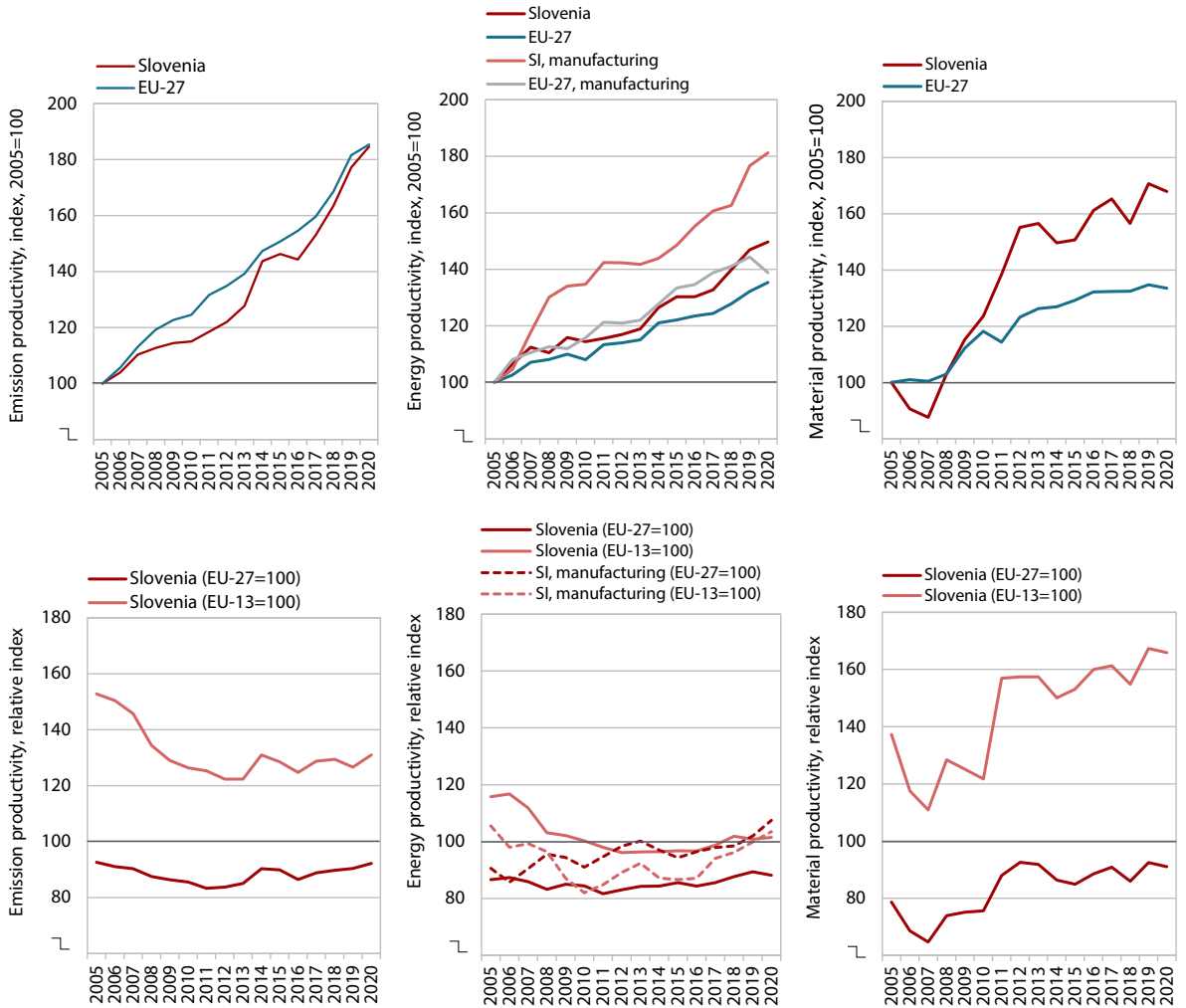
Figure 43: Most GHG emissions in Slovenia come from the transport and energy sectors; less than half of emissions are generated in ETS sectors; companies participating in the EU ETS cover a quarter of their emissions with free allowances and buy most of the needed allowances through auctions



Sources: ARSO (2022) and MOP (2022); calculations by IMAD.

Note: The decrease in the number of allowances issued after 2012 is due to the changed legislation, according to which electricity producers were no longer entitled to free allowances, and cessation of operations of some large plants included in the EU ETS system, e.g. Block 3 and Block 4 of Termoelektrarna Šoštanj, d.o.o., HSE – Energetska družba Trbovlje, d.o.o., and Lafarge Cement d.o.o.

Figure 44: Emissions, energy and material productivity have improved, but Slovenia still lags about one-tenth behind the EU-27 average in all three areas



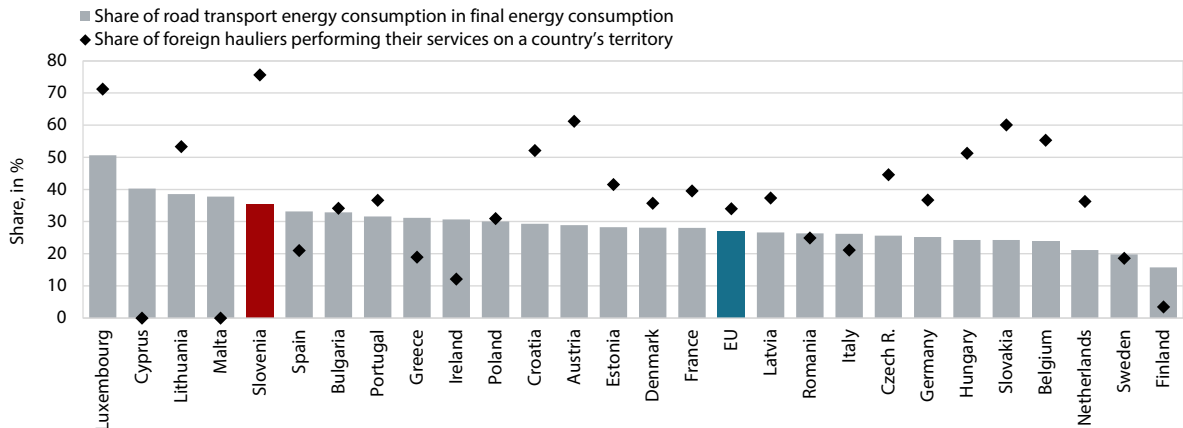
Source: Eurostat (2022c); calculations by IMAD. Note: When calculating productivity for comparisons over time, we use GDP at fixed prices, while for comparisons between countries in individual years, GDP in purchasing power standards is used.

Slovenia’s share of energy consumption and greenhouse gas emissions from transport are above average mainly due to its transit location. As a small transit country for tourist and goods flows, Slovenia has a very high share of fuel consumed in road transport, which is higher only in four other EU Member States.¹⁵⁶ The comparatively high share is partly due to the heavy transit of trucks and foreign tourists in the summer season. The lower fuel price compared to neighbouring countries, which has sometimes been seen again since 2020, additionally promotes the purchase of fuel by vehicles in transit. In this area, too, a change in the energy taxation system and the abolition of all exemptions and incentives that run counter to emissions reduction objectives are important for long-term success (JJS-CEU, 2021; Government of the RS, 2020). As traffic flows are expected to continue to increase in the coming years, the green transition must

¹⁵⁶ All fuel sold at a country’s service stations is considered as road transport energy consumption in that country, regardless of where the fuel is consumed. If the price of fuel were higher in Slovenia than in neighbouring countries (which has often not been the case in recent years), this would not encourage to additional purchases of fuel by vehicles in transit, which statistically increase fuel consumption and emissions from transport in the country.

be promoted through sustainable mobility measures. This includes the expansion of public transport and replacement of liquid fossil fuels for vehicles by electricity, hydrogen and synthetic biofuels.

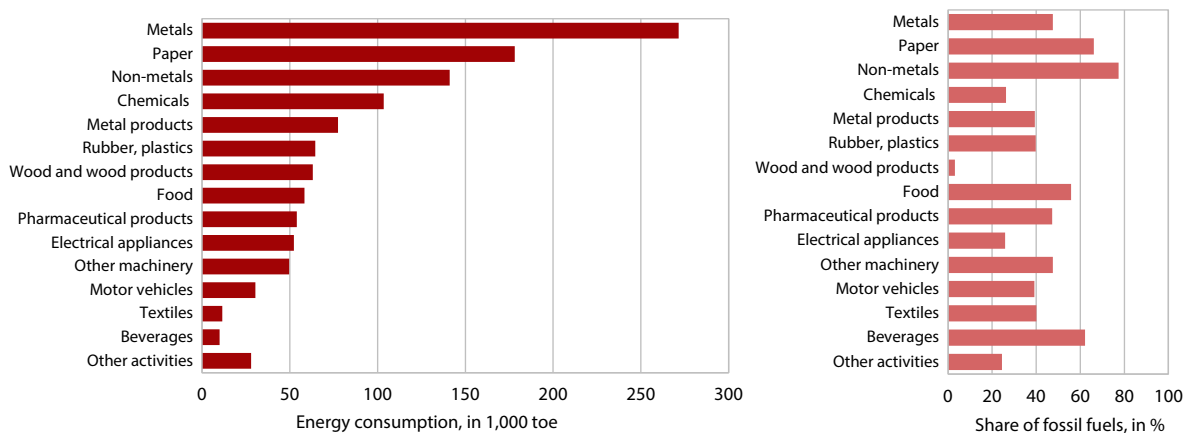
Figure 45: In 2020, the share of road transport energy consumption in final energy consumption in Slovenia was much higher than the average for EU Member States



Source: Eurostat (2022c); calculations by IMAD.

In manufacturing, where energy productivity has increased much more than in the economy as a whole, the four most energy-intensive activities, which consume almost 60% of all energy used in the sector, pose the greatest challenge. The metal, paper, mineral (cement, glass, ceramics) and chemical industries consume almost three-fifths of the total energy used, while they create only 15% of the value added in manufacturing. Their energy productivity is therefore much lower than in other activities, while labour productivity – also due to the more capital-intensive nature of these activities – is about a tenth higher (the highest value added per person employed in 2020, EUR 66 thousand, was achieved in the chemical industry, while the lowest, EUR 41 thousand, was in the metal industry; the average in manufacturing was EUR 45 thousand). In the mineral and paper industries, the share of fossil fuel use, i.e. coal, liquid fuels and natural gas, is particularly high (77% and 66% respectively) and these energy sources need to be replaced by more environmentally friendly ones as part of the transition to a carbon-free society.

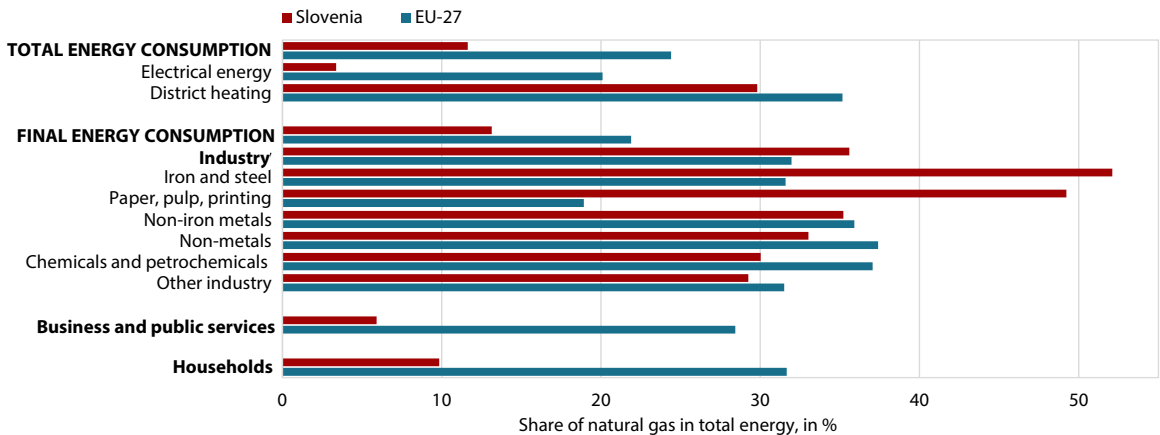
Figure 46: In 2020, the four most energy-intensive manufacturing activities accounted for 58% of all energy consumed in manufacturing



Source: SURS (2022d); calculations by IMAD.

Given the interrupted supplies and high prices of Russian natural gas, reducing dependence on this energy source represents a particular challenge. In 2020, natural gas accounted for 12% of total energy consumption in Slovenia and almost a quarter in the EU (Eurostat, 2022c). According to Eurostat estimates, Slovenia’s dependence on Russian gas in 2021 was between 75% and 100%¹⁵⁷ (Eurostat, 2022d) (taking into account direct and indirect imports via other countries). Slovenia’s dependence on natural gas is relatively low by EU standards both for electricity generation and for energy use in business and public services and in households. Its dependence in district heating and industry is comparable to the EU level, where the shares are higher. The share of natural gas in energy consumption in the steel and paper industries is particularly high (52% and 49% respectively; EU: 32% and 19% respectively). Good performance of energy-intensive companies is very important when addressing the challenges related to high energy prices. In 2021, the chemical industry recorded a net profit of EUR 171 million, the metal industry (after recording a loss in the previous year) EUR 102 million, the mineral industry EUR 94 million, while the profit in the paper industry shrank from EUR 52 million in 2020 to EUR 8 million. The return on assets in 2021 was above average only in the chemical and mineral industries (10.5% and 8.6% respectively, against 6.7% in manufacturing as a whole).

Figure 47: Dependence on natural gas is lower in Slovenia than in the EU as a whole when it comes to total energy consumption, while it is much higher in the steel and paper industries in particular (figures for 2020)



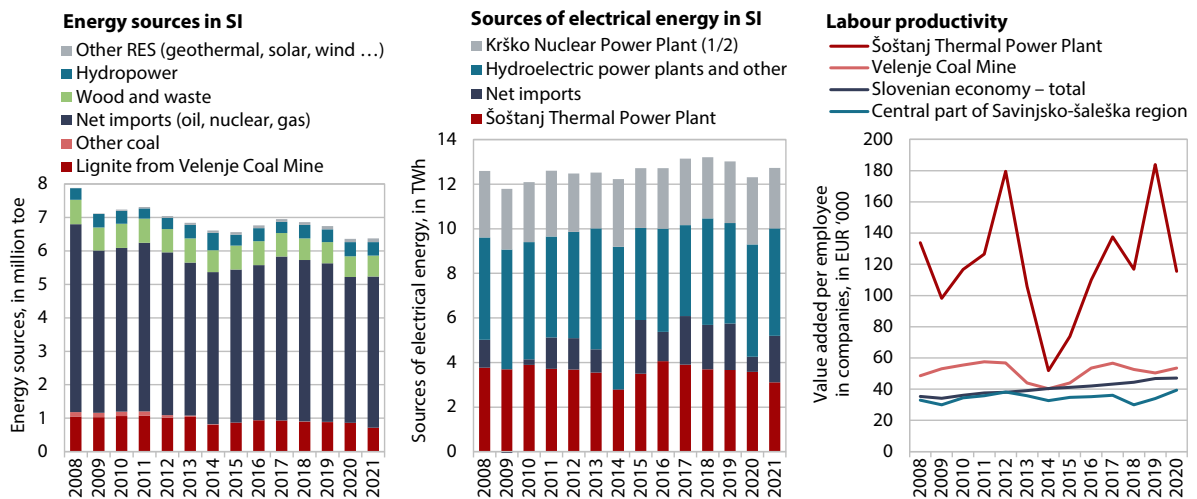
Source: Eurostat (2022c); calculations by IMAD.

With the closure of coal mines, we will face great challenges in replacing the use of coal and finding a solution for coal regions. The Šoštanj Thermal Power Plant produces about one-third of all electricity generated in Slovenia. As it is scheduled to close by 2033, it needs to be replaced by generation from more environmentally friendly sources. This requires greater and faster investment in the use of renewable energy sources, as growth in the use of energy from these sources has been extremely modest. Over the period 2005–2020, it increased by 6%, which is well below the EU average (92%) and the lowest of all Member States. With the closure of the coal mine, solving the problem of district heating connected to the coal-fired power plant will be a particular challenge. In line with the planned restructuring of

¹⁵⁷ The EC estimates that in 2021 the EU imported over 45% of natural gas from Russia (this share decreased to 15% by September 2022), with the rest coming from Norway, Algeria, the US, Qatar and other countries (Saveyn, 2022). Slovenia and the EU also have a similar dependence on coal imports from Russia (46%), but Slovenia is less dependent on imports of oil and oil products (27%). These two dependencies are less problematic because the choice of alternative suppliers is greater. Slovenia is not dependent on imports of Russian coal, but it is estimated that indirect and direct dependence on imports of liquid fuels is slightly higher than in the EU as a whole.

the coal mining regions and the principles of just transition, aid should be targeted at the further development of the region, in particular creation of jobs, including higher value-added jobs. Companies could use their skills in construction, especially in construction of tunnels, and engineering, environmental rehabilitation and wood processing. The rehabilitation of degraded areas will enable the development of new activities, such as tourism (Mzl, 2022).

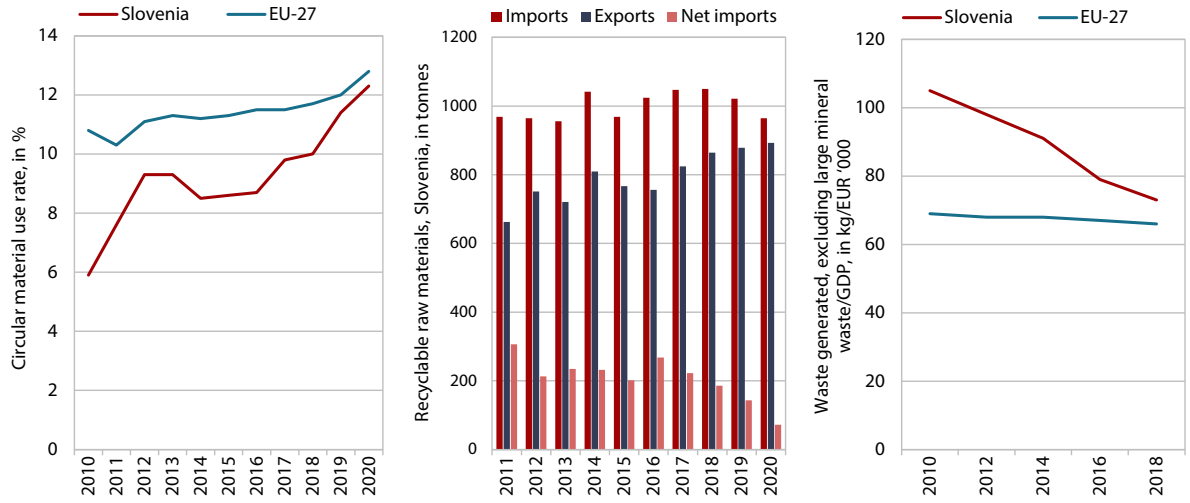
Figure 48: The Velenje Coal Mine and the Šoštanj Thermal Power Plant have made a major contribution to Slovenia's energy supply over the years



Sources: (1) SURS (2022d); Velenje Coal Mine (2021). Note: Nuclear fuel is statistically considered domestic production but is not taken into account here, because Slovenia actually has to import it; (2) ELES (2021). Note: Only half, i.e. the Slovenian part, of the Krško Nuclear Power Plant's production is considered domestic production; (3) AJPES (2021); Velenje Coal Mine (2021), Šoštanj Thermal Power Plant (2021); calculations by IMAD.

Although progress in waste management and reuse, which are among the most important elements of the circular economy, has been considerable, it still needs to be accelerated. The circular material use rate, i.e. the share of material recycled and fed back into the economy, has doubled in Slovenia over the last decade and reached around 12% in 2020, approaching the EU average. As increasing amounts of waste are turned into a resource, i.e. fed back into the economy, net imports of recyclable raw materials decreased, while exports increased. At the same time, resource efficiency increased, as less waste was produced per unit of GDP. Considerable progress has also been made in the management of municipal waste. In 2020, 60% of municipal waste was recycled, compared to less than 50% in the EU as a whole.

Figure 49: The circular material use rate has reached the EU average and the net imports of recyclable raw materials has decreased; waste generated per unit of GDP, excluding mineral waste, has also approached the EU average



Source: Eurostat (2022c).

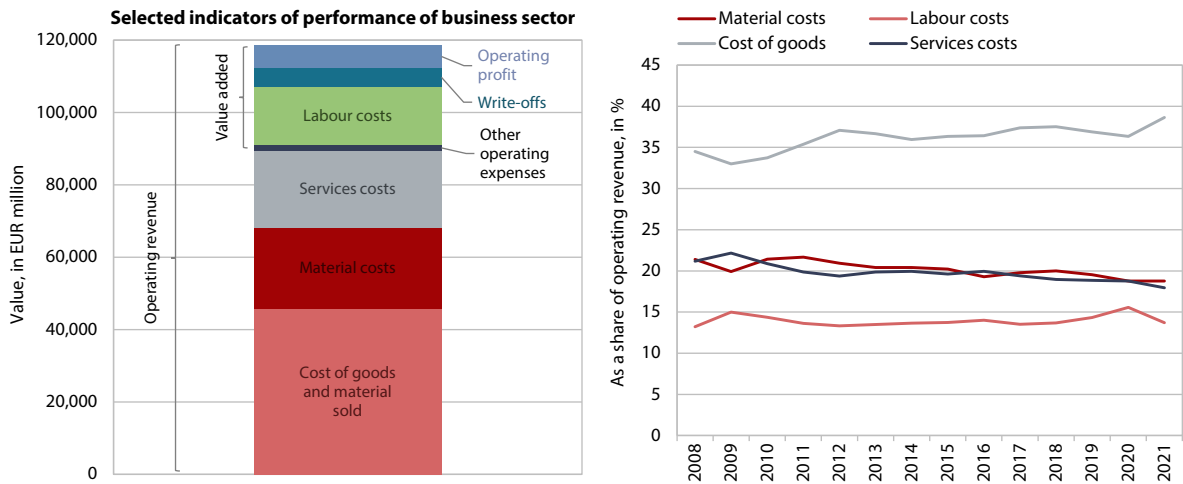
4.2.2 Exposure to cost pressures and competitiveness

Material costs, including energy costs, have a direct impact on value added and (therefore on labour) productivity indicator. Over the period 2008–2020, the burden of material costs on operating revenues largely declined, which had a positive impact on the growth of value added and productivity. The significant increase in material and raw material prices in 2021 has not yet been reflected in an increase in the material-costs-to-revenues ratio this year. This means that, on average, companies have either passed higher material costs on higher prices¹⁵⁸ or increased their efficiency, i.e. reduced the material input per unit of product. Energy accounts for about one-tenth of material costs or 2% of revenues. A 25% increase in energy costs would, *ceteris paribus*, reduce value added by 2%.¹⁵⁹ On average, the direct effect is not large, but energy costs also have an impact on a number of other material and service costs, and some activities are also more affected by energy cost increases due to their higher energy intensity.

¹⁵⁸ The extent to which companies pass costs on to higher prices depends on their competitive position. Especially in highly competitive markets, above-average price pass-through usually leads to a reduction in the quantity of products and services sold or to a decline in market share.

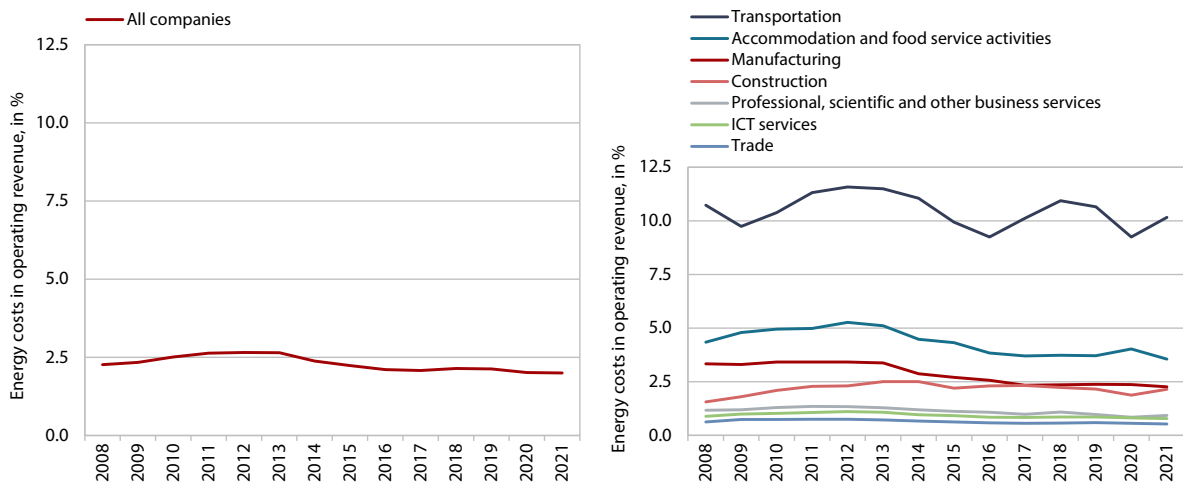
¹⁵⁹ On average, the actual energy costs of companies increased by 22.8% in 2021, and, after being relatively low in 2020, value added increased by 17.6% (or by 15.3% if subsidies are included in the calculation).

Figure 50: Material costs have a significant impact on value added and productivity



Source: AJPES (n.d.-b); calculations by IMAD.

Figure 51: The burden of energy costs on revenues declined slightly in 2013–2021 and was highest in transportation



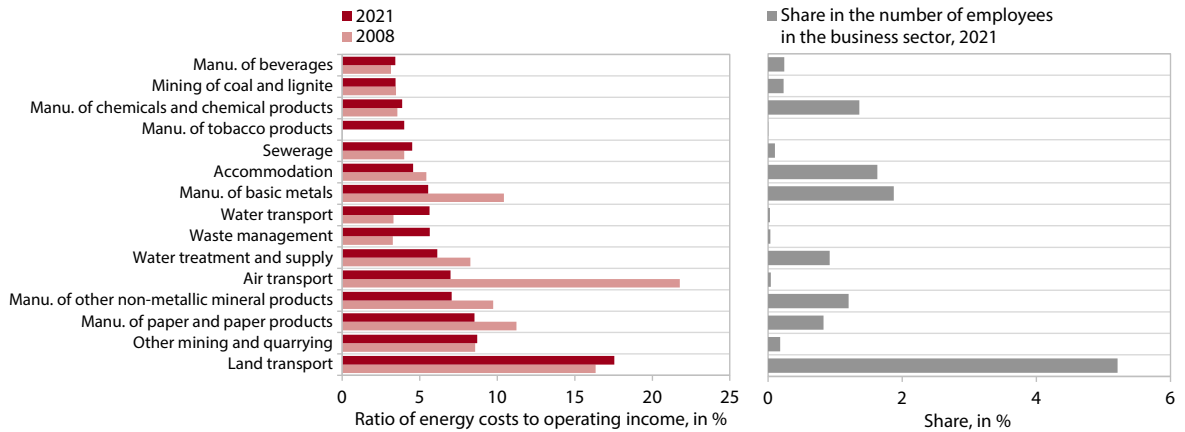
Source: AJPES (n.d.-b); calculations by IMAD.

Energy costs are highest in land transport, while energy- and emissions-intensive manufacturing activities have significantly reduced the energy-costs-to-revenue ratio in recent years. Land transport stands out in terms of the share of energy costs in revenues, while costs are also high in the manufacture of paper, non-metallic mineral products, basic metal products and chemical products and in the accommodation sector. The 15 industries with the highest ratio of energy costs to revenues,¹⁶⁰ where energy costs represent a half of business sector costs, also include mining and quarrying and some municipal and transport services, but these are relatively minor or not as market-oriented activities. Particular attention should be paid especially to energy- and emissions-intensive manufacturing activities (paper, non-metallic mineral products, basic metal products and chemical industry), which are at greater risk of carbon leakage, i.e. offshoring of production to countries with less ambitious climate and energy goals, as they are more exposed

¹⁶⁰ The range of activities remained virtually unchanged even if energy costs are analysed in relation to value added. Other conclusions of the analysis are also robust.

to international competition. It is encouraging that in 2021, companies in the emissions-intensive manufacturing sector had significantly reduced the burden of energy costs on revenues compared to 2008 (from 8.4% to 5.8%) and increased their revenues (more in foreign than in domestic markets) and value added by 50%. Meanwhile, the number of employees in these activities fell by more than 10% over the same period.

Figure 52: Energy costs are the highest in land transport and are also high in the manufacture of paper, non-metallic mineral products, basic metal products and chemical products and in accommodation



Source: AJPES (n.d.-b); calculations by IMAD.

Table 1: Selected company performance indicators for 2021

	Share in energy costs	Share in value added	Share in number of employees	Productivity (in EUR per employee)	Operating efficiency	Export orientation
15 activities with the highest share of energy costs	50.2	12.9	14.0	46,690	1.06	59.0
... of which energy-intensive manufacturing activities	18.5	6.5	5.3	61,986	1.07	73.2
Other business sector activities	49.8	87.1	86.0	51,328	1.06	42.9

Source: AJPES (n.d.-b); calculations by IMAD. Note: Emissions-intensive manufacturing activities are manufacture of paper, manufacture of other non-metallic mineral products, manufacture of basic metals and manufacture of chemical products.

Box 3

Direct and indirect energy costs

A similar, but even more comprehensive, picture of the pressure on individual activities in terms of energy costs emerges if the analysis also includes the energy that enters the production process via materials and semi-finished products, i.e. indirect energy costs. Among activities that account for more than 0.5% of Slovenia's GDP, the indirect and direct burden of electricity, gas and steam costs in 2018 was greatest in the manufacture of basic metals and paper, printing, water supply and sewerage, and the manufacture of non-metallic mineral products. This is also true for the EU as a whole, with the burden being particularly high in the manufacture of non-metallic mineral products. The industries most affected by the high cost of coke and petroleum products are land transport and transport via pipelines, the chemical industry, and the manufacture of non-metallic mineral products, while the timber industry is somewhat less affected.

Figure 53: Share of electricity, gas and steam costs in output, 2018

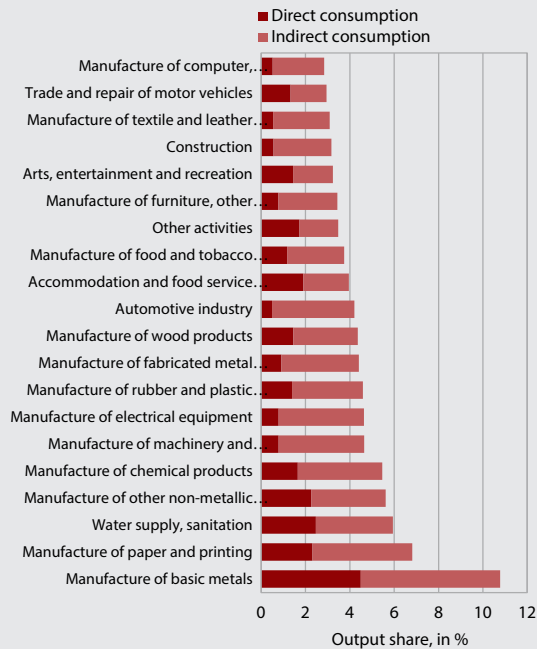
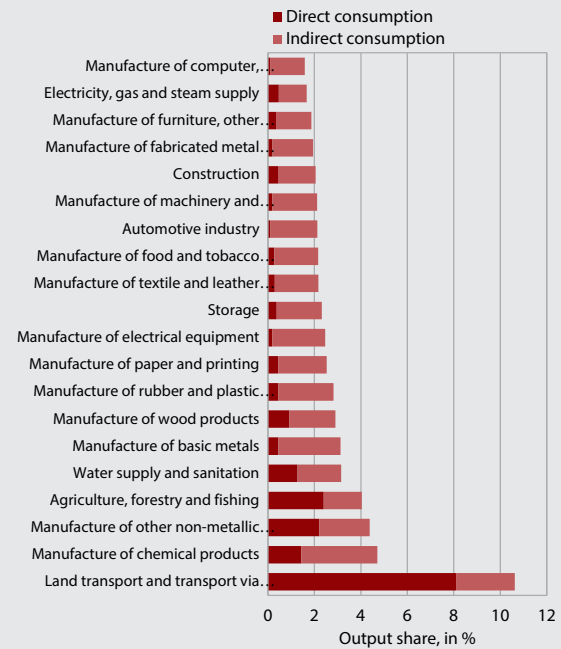
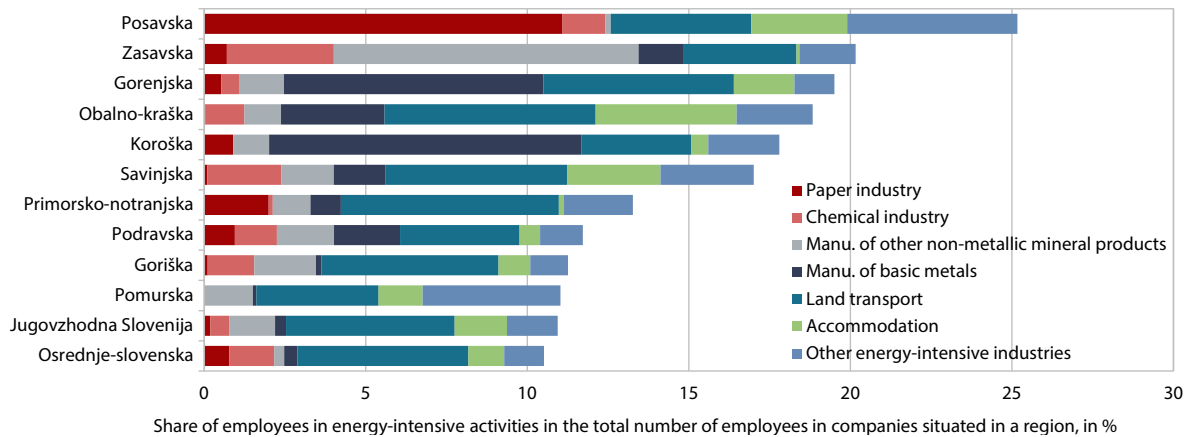


Figure 54: Share of petroleum product and coke in output, 2018



Source: OECD (2021g). Note: The 20 industries with the highest share of electricity, gas and steam costs in output (Figure 53) and 20 industries with the highest share of petroleum product and coke in output (Figure 54) are listed, excluding industries whose value added accounts for less than 0.5% of Slovenia's GDP.

Analysis by region shows that in 2021, Posavska, Gorenjska, Zasavska, Koroška and Obalno-kraška were among the most exposed in terms of the share of jobs in energy-intensive sectors. The first four regions stand out due to their high share of employees in energy- and emission-intensive manufacturing sectors, i.e.: manufacture of paper (Posavska), manufacture of non-metallic mineral and chemical products (Zasavska), and manufacture of basic metals (Gorenjska and Koroška). The Obalno-kraška region was among the most exposed mainly due to the higher proportion of workers in the accommodation sector and a high proportion of workers in land transport.

Figure 55: Regional exposure in terms of share of jobs in energy-intensive activities (2021)

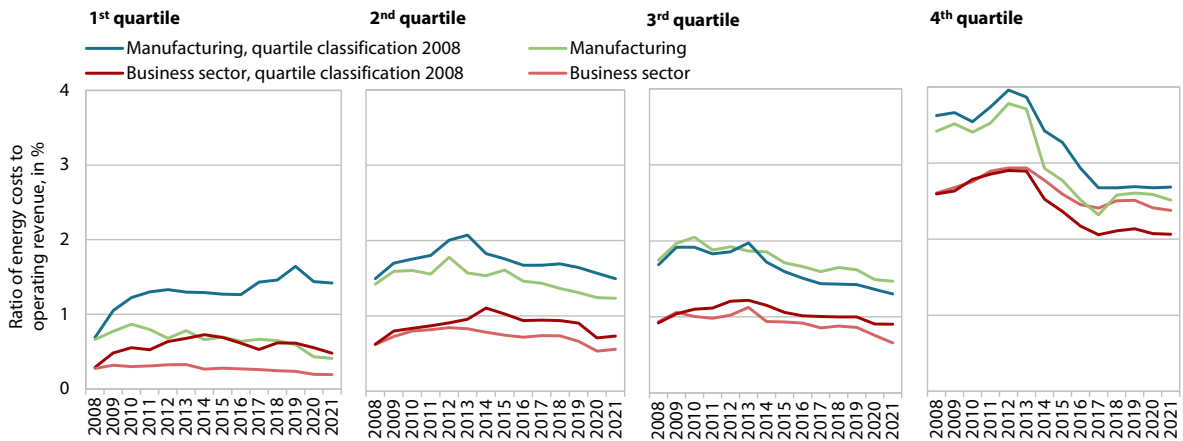
Source: AJPES (n.d.-b); calculations by IMAD.

Over the period 2008–2021, the largest energy consumers were more successful in reducing their burden of energy costs on revenues. The largest energy consumers are mainly energy-intensive and/or large companies that benefit most from reducing energy costs and/or have more opportunities to do so. Companies that operated throughout the 2008–2021 period and were among the top 25% of consumers¹⁶¹ in the base year 2008 were much more successful in reducing their burden of energy costs on revenues. The ratio of energy costs to revenues also decreased significantly among the largest consumers in the manufacturing sector.¹⁶² Eurostat data show that electricity was lower for large electricity consumers, although the price dynamics for large companies was not more favourable in the analysed period – prices for large consumers increased slightly more than for typical consumers (IC) or certain small consumers. The same applies to natural gas. This might lead to the conclusion that large consumers have actually been more successful in reducing relative energy costs due to energy-efficiency improvements or transition to energy sources with lower prices.

¹⁶¹ Such a comparison allows for an estimate cleansed of the effect of transitions of enterprises between quartiles and of the entries and exits of enterprises between individual years.

¹⁶² Since Ajpes data do not allow a breakdown of energy costs by quantities and prices, it is not possible to determine whether, in the case of large consumers, the lower increase in energy prices also contributed to the reduction in their relative costs.

Figure 56: The largest consumers have significantly reduced the burden of energy costs on their revenues since 2013



Source: AJPEŠ (n.d.-b.); calculations by IMAD. Note: Companies with at least one employee and a positive income value are taken into account, whereby the energy costs may not exceed the income. Companies are classified into quartiles according to absolute energy costs. The classification into quartiles with a fixed base year (2008) makes it possible to evaluate trends cleansed of the effect of transitions of enterprises between quartiles and the entries and exits of enterprises between individual years.

In the period 2008–2021, electricity prices mostly had a positive impact on the price competitiveness of Slovenian companies, but their impact in the light of climate and energy targets was questionable. Electricity prices lagged behind those in the EU¹⁶³ and, up to and including 2020, behind the increase in industrial producer prices or other final prices (GDP deflator, inflation), which led to the relative price of electricity falling until last year. The price of gas – which accounts for a smaller proportion of energy consumption – for a typical non-household customer (I3) was not lower than the EU average but was lower than in 2008 until the outbreak of the energy crisis.¹⁶⁴ The relatively slow increase in electricity prices can be partly attributed to the lower tax burden on this energy source in Slovenia. In 2021, non-refundable taxes and charges (excluding VAT) on electricity consumption in Slovenia amounted to EUR 0.018 per kWh for a typical non-household consumer (IC), while the EU average was EUR 0.043.¹⁶⁵ These can be an important tool for achieving climate and energy targets through price signals and also by providing funds for investments.¹⁶⁶

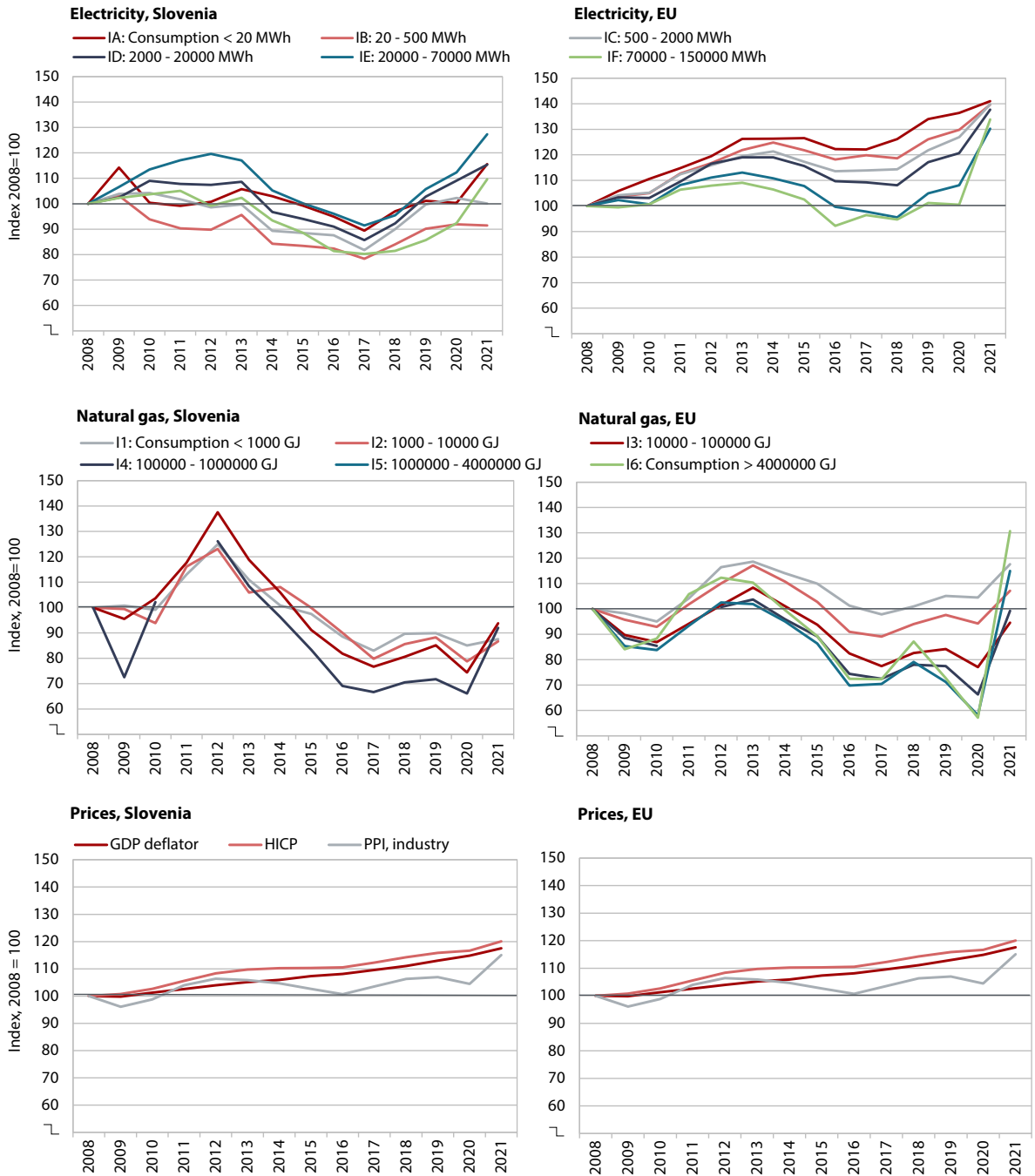
¹⁶³ In 2021, electricity prices in Slovenia were 22% to 30% below the EU average prices for comparable consumers. After a significant price increase both at home and abroad, electricity prices in Slovenia in the first half of 2022 were 6% to 42% lower than average prices for comparable consumers in the EU.

¹⁶⁴ The gas price (excluding VAT) in 2021 was about 5% higher for typical (I3) and large non-household consumers (I4) than with respect to comparable consumers in the EU on average, while it was 4% (I2) and 16% (I1) lower for small consumers.

¹⁶⁵ To mitigate the impact of the energy crisis, non-refundable taxes and charges were reduced to EUR 0.023 per kWh in the first half of 2022 at the EU level and to EUR 0.015 in Slovenia.

¹⁶⁶ See also Section 4.2.4.

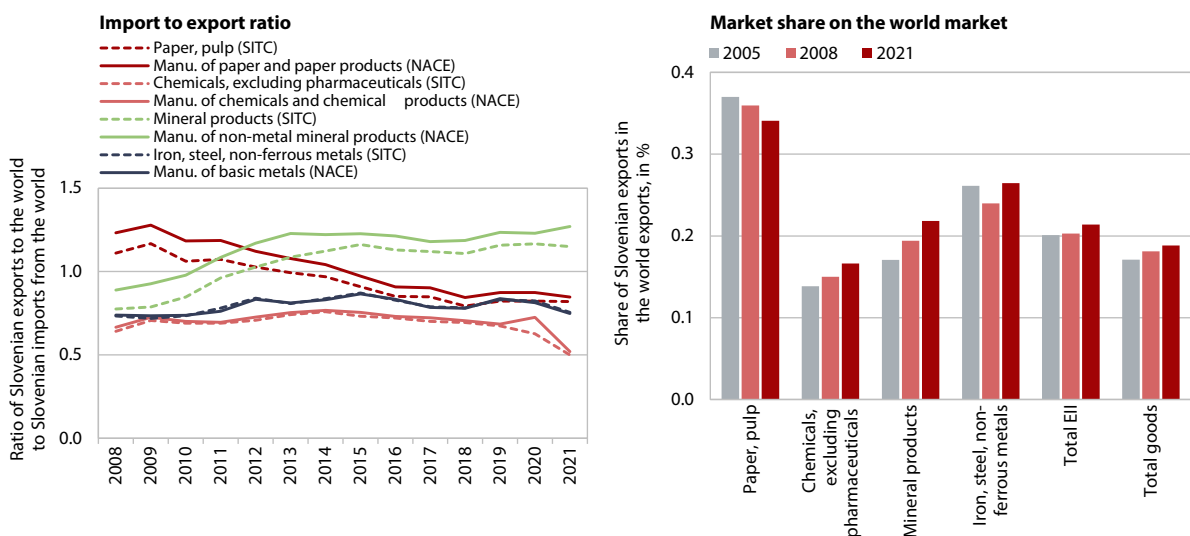
Figure 57: Electricity and gas prices have mostly had a favourable impact on the competitiveness of Slovenian non-household consumers



Source: Eurostat (2022c); calculations by IMAD. Note: HICP – Harmonised Index of Consumer Prices, PPI – producer’s price index.

Slovenia is a net importer of energy- and emission-intensive products, which are given special attention in the light of high energy prices and emission allowances. In 2021, exports of paper, chemicals, metals and non-metallic minerals (hereinafter referred to as energy- and emission-intensive industries)¹⁶⁷ were 32% lower than imports (23% lower in 2008). Between 2008 and 2021, imports grew faster than exports only in the *manufacture of chemical products and pulp and paper products*, where Slovenia went from being a net exporter to a net importer. The picture is reversed for the *manufacture of non-metallic mineral products* (cement, glass, ceramics, etc.): in 2021, exports of these products were about one-fifth higher than imports. In the largest export group, *manufacture of basic metals*, the value of products imported by Slovenia is a quarter higher than the value of exports.

Figure 58: In terms of net exports and market shares on the world market, the strongest increase was for mineral products and the smallest for paper



Sources: SURS (2022d), UN Comtrade (2022), Unctad (2022); calculations by IMAD.

The growing export market share on the world market shows that Slovenia has managed to maintain or even improve its competitive position in most energy- and emission-intensive products. In 2008–2021, Slovenia's exports of energy- and emission-intensive products increased more than global exports, which means that Slovenia's export market share increased. The increase was strong for mineral and chemical products, while it was less pronounced for metals. The market share of paper products declined but still remains high (as do the comparative advantages measured by RCA¹⁶⁸). Slovenia also has a relatively high market share in metals, although it is a net importer of these products. This indicates high consumption of these products in Slovenia (related to the structure of the economy) and strong participation in international trade of metals with high within-product trade.¹⁶⁹ For Slovenia, the EU remains by far the most important export destination for energy-intensive products: in 2020, 74% of exports were destined for the EU (76% in 2008). Mineral products (87%) are most likely directed to the EU market, while

¹⁶⁷ Manufacturing activities with the highest ratio of energy costs to revenues or value added. See Section 4.2.1.

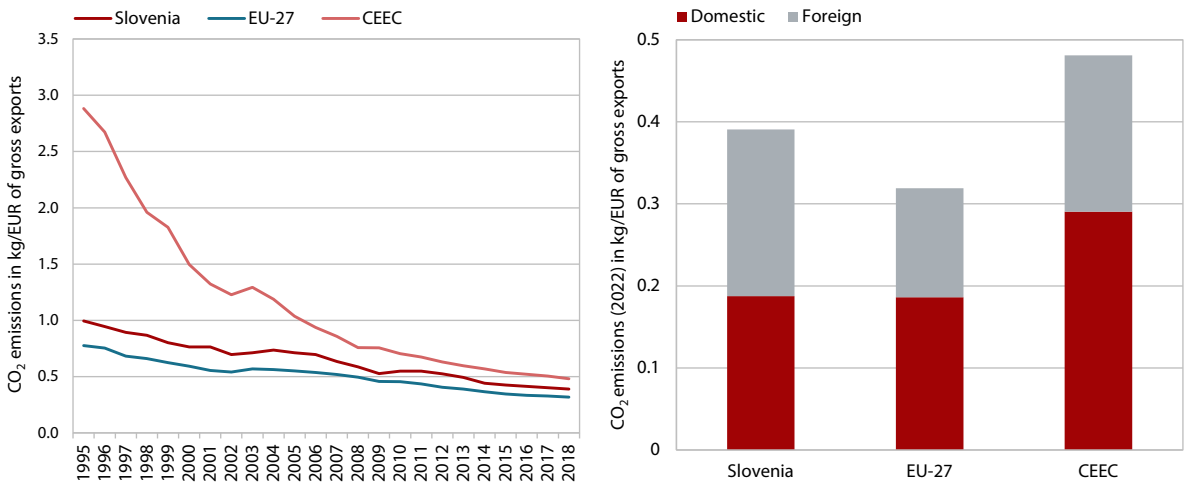
¹⁶⁸ According to the RCA indicator (Revealed Comparative Advantage), a country has a comparative advantage if the share of a product or group of products in total exports is higher than the global average.

¹⁶⁹ This is confirmed by the extremely high Grubel-Lloyd index (0.9), where a value of 1 means that the country in consideration imports as much of a specific product or a specific group of products as it exports, and 0 means that the country is exclusively an importer or exporter of a specific product.

paper products (68%) are least likely. Increasing cost pressure due to the energy crisis and the need for increased adaptation in light of the EU’s climate and energy commitments could tighten the competitive position of Slovenian exporters in the coming years, especially outside the EU.

CO₂ emissions embodied in products in international trade, which can be a rough indicator of competitiveness due to the desire to achieve ambitious environmental targets, also declined but remained above the EU average. Since climate policy pays particular attention to the issue of carbon leakage, the emissions for the period 1995–2018 were calculated on gross exports.¹⁷⁰ This takes into account CO₂ emissions embodied in imported intermediate products (foreign emissions) and CO₂ emissions generated in the manufacture of products for export (domestic emissions). The results show that emissions per unit of gross exports in Slovenia decreased slightly faster than the EU average over the period analysed but remained at a higher level in this comparison. During this period, major shifts occurred in the Central and Eastern European Countries (CEEC)¹⁷¹: after being relatively high at the beginning of the period, when they were 3.7 times higher than the EU average (28% higher in Slovenia), emissions per unit of gross exports declined significantly and approached the level recorded in Slovenia. In 2018, emissions in Slovenia were 22% above the EU average in this calculation but 19% below the CEEC average. In all three observations – at the levels of the EU, the CEEC average and Slovenia – the amount of domestic emissions decreased more than that of foreign emissions (OECD, 2021a). At the same time, the share of emissions embodied in imported products (foreign emissions) in total emissions per unit of gross exports in 2018 was higher in Slovenia than the EU and CEEC averages.

Figure 59: Slovenia ranks around the EU and CEEC average in terms of the amount of CO₂ emissions per euro of gross exports, with domestic emissions accounting for half of the total export-related emissions



Source: OECD (2021a); authors’ calculations.

¹⁷⁰ The calculations of CO₂ emissions per unit of gross exports are based on data from the OECD input–output TiVA database and the IEA (International Energy Agency) CO₂ emissions database. The methodology used is similar to input–output analysis.

¹⁷¹ CEEC countries include the Czech Republic, Hungary, Poland, Slovakia, Slovenia, Bulgaria, Croatia and Romania.

4.2.3

Sustainable transformation of the business sector

Slovenia is not yet exploiting its full potential when it comes to activities related to the circular economy, environmental protection and resource management.

Although at 1.3%, the share of GDP generated by activities related to the circular economy¹⁷² in Slovenia is the second highest in the EU (1% of GDP), it remained unchanged in the decade after 2010. On the other hand, Slovenia lags significantly behind in broadly defined activities related to environmental protection and resource management,¹⁷³ ranking 19th (1.6% of GDP compared to 2.3% in the EU as a whole), and the share has actually been declining since the peak in 2014 (1.8% of GDP), indicating significant untapped potential. Data on employment show a similar picture: Slovenia ranks 8th in terms of the share of employees in activities related to the circular economy in total employment (2%; EU: 1.8%) and 7th in activities related to environmental protection and resource management (3%; EU: 2.2%). However, in the case of the former indicator, the share has been decreasing since 2015, while in the case of the latter it has remained stable, meaning that it has not increased, widening the gap with the leading countries (Finland, Estonia and Luxembourg).

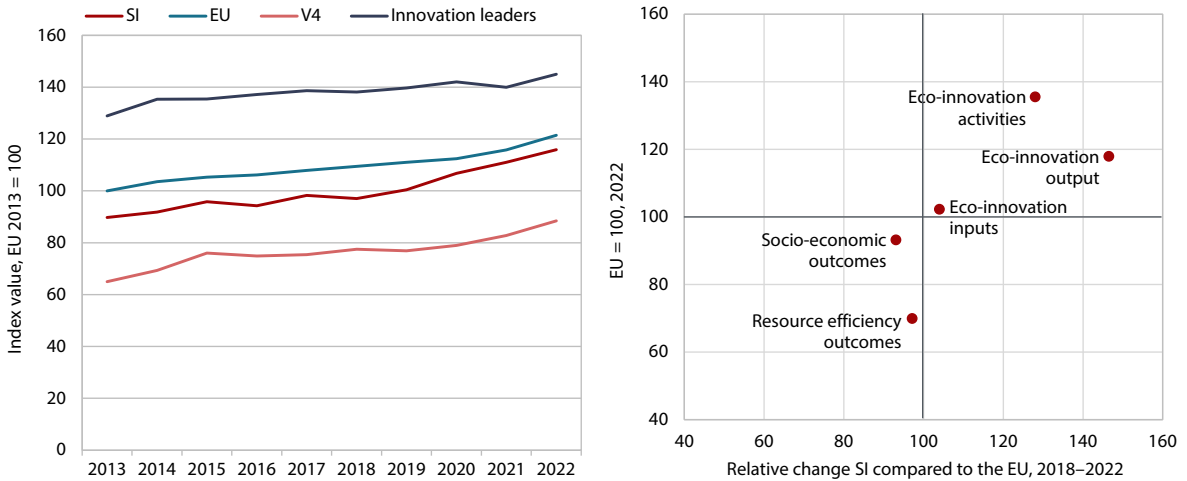
Slovenia is making progress in the field of eco-innovation but not fast enough to narrow the gap with the EU average over the last two years.

According to the Eco-Innovation Index (EC, 2022e), Slovenia improved its position from 16th to 11th place in 2018–2020, and since then the gap with the EU average has remained unchanged. Progress is the result of increased eco-innovation inputs (in particular government investment in environmental and energy research), the impact of which is mainly reflected in the increased number of scientific publications in the field of eco-innovation, while companies have also stepped up their efforts to obtain environmental certificates. At the same time, the changes presented are not (yet) reflected in improved resource efficiency or socio-economic outcomes, where Slovenia still lags noticeably behind (Figure 60). Case studies in Slovenia also show that better results can be expected if input increases, and that sustainability and social orientation are also reflected in a higher innovation intensity of companies (Hojnik et al., 2022; Štrukelj et al., 2020).

¹⁷² These are activities related to recycling (of waste and materials), repair, maintenance and reuse – for methodology, see https://ec.europa.eu/eurostat/documents/8105938/8465062/cei_cie010_esmsip_NACE-codes.pdf (Eurostat, n.d.).

¹⁷³ Activities are defined according to (a) the Classification of Environmental Protection Activities (CEPA), which includes activities related to water management and treatment, protection of biodiversity, and environmental research and development, and (b) the Classification of Resource Management Activities (CReMA), which includes management of forest resources, energy resources and minerals and research and development activities for resource management. For a more detailed methodology, see https://ec.europa.eu/eurostat/cache/metadata/en/env_egs_esms.htm.

Figure 60: The situation in the field of eco-innovation in Slovenia has been improving for a long time, but so far mainly on the side of inputs and activities, while still lagging far behind in terms of efficiency and outcomes



Source: EK (2022e); calculations by IMAD. Note: “eco-innovation inputs” include government environmental and energy R&D investments and the share of R&D personnel, “eco-innovation activities” include the number of ISO 14001 certificates per capita, “eco-innovation outcomes” include eco-innovation-related patents and academic publications per capita, “material efficiency” takes into account material, water, energy and emissions productivity, and “socio-economic outcomes” refer to the share of exports, employment and value added resulting from activities related to environmental protection and resource management.

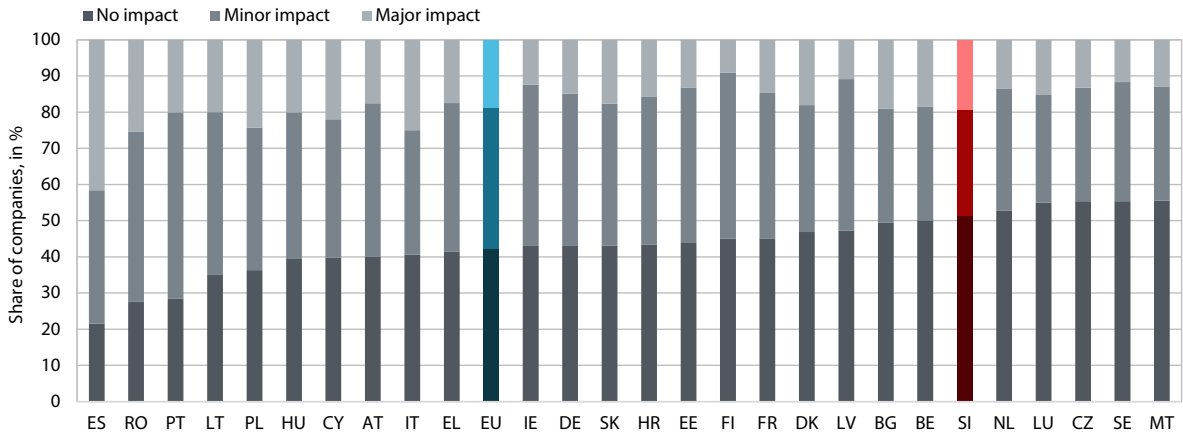
Although the data on internal monitoring of the achievement of carbon emissions and energy targets are very encouraging... According to the EIB (2022), the share of Slovenian companies that have in place internal carbon and energy targets and monitoring increased significantly in 2020. At 57%, Slovenia has the third highest share of such enterprises and among large enterprises this share is the second highest in the EU, which represents significant progress compared to the situation a decade ago (Horváth et al., 2017). According to this share, Slovenia is now 18 p.p. above the EU average and lags only 7 p.p. behind the leader Sweden.

... Slovenian companies are much less concerned about the impact of climate change on their business than companies in most other EU Member States. In 2020, 51% of Slovenian companies believed that climate change would have no impact on their business. This is 9 p.p. more than the EU average and represents the sixth highest share in the EU (EIB, 2022).¹⁷⁴ According to the EIB survey, in 2019 as many as 74% of Slovenian companies did not expect GHG emission reductions to have an impact on their reputation (21 p.p. higher than the EU average). Slovenian companies were also significantly more conservative than the EU average when it came to how they perceived the impact of climate change on their market demand and on supply chains.¹⁷⁵ In 2020, Slovenia had one of the lowest shares of companies that see stricter environmental standards and legislation as an opportunity in the next five years (18%) and the fourth highest share of companies that expect legislation and standards to have no impact, although studies of Slovenia show that environmental laws should have a positive impact on the environmental orientation and environmental results of companies (Hojnik et al., 2022). This could also be related to the lower importance that company managements in Slovenia attach to environmental sustainability compared to company managements of both global companies and companies from Central and Eastern Europe, while social cohesion is given significantly above-average attention (Chikova et al., 2022).

¹⁷⁴ Among SMEs, there are even more such companies, i.e. 57% or 12 p.p. more than the EU average.

¹⁷⁵ 63% of companies in Slovenia expected climate change to have no impact on market demand (EU: 51%) and only 20% expected a positive impact (EU: 34%). At the same time, 66% of companies expected climate changes to have no impact on supply chains (EU: 58%) and 13% expected a positive impact (EU: 17%).

Figure 61: Slovenian companies estimate that climate change will have less impact on their business than is the case for companies from most other EU Member States

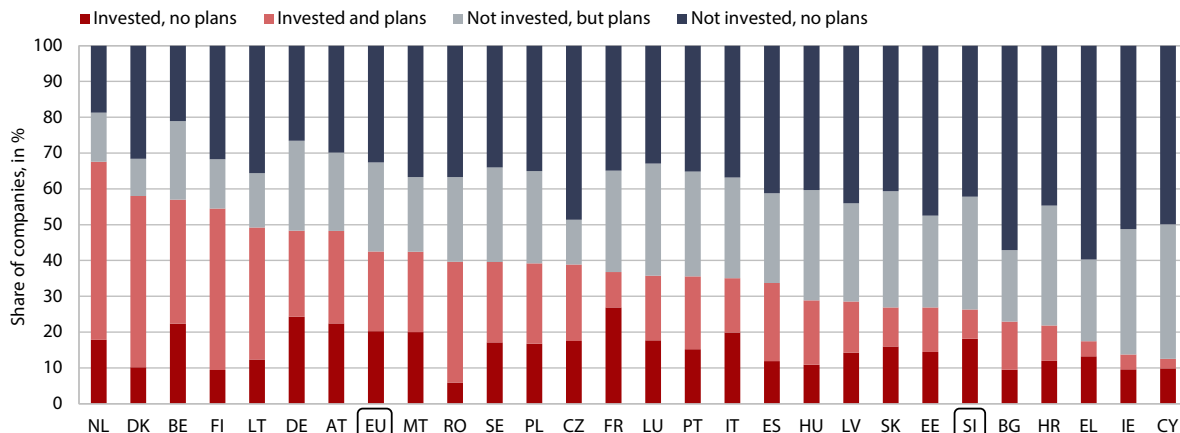


Source: EIB (2022).

This is reflected in the insufficient sustainable investment by companies, where Slovenian companies lag far behind... Although, according to preliminary EMS data (2022), as many as 68% of companies surveyed improve the environmental impact of products when introducing new products, direct investment in sustainability remains extremely low. As is shown in Figure 62, EIB (2022) data suggests that only 26% of Slovenian companies have invested in projects related to climate change and carbon footprint reduction, which is the sixth lowest share within the EU. In the EU as a whole, there are 43% of such companies, while in the leading country, the Netherlands, the figure is as high as 68%. The share of enterprises that have not yet invested but intend to do so in the next three years is above average (31% in Slovenia compared to 25% in the EU), but at the same time the share of enterprises that have not invested and do not plan to invest is also above average.¹⁷⁶ There are no significant differences between large enterprises and SMEs, with only a slightly higher share of companies that do not want to invest at all among the latter. According to the preliminary EMS data (2022), the main barrier to the adoption of the circular economy concept is high costs (38% of companies rate it as a significant or very significant barrier), followed by difficulties in predicting the benefits (28% of companies) and the lack of appropriate technologies (24% of companies).

¹⁷⁶ There are one third of such companies in the EU and 42% in Slovenia, which is the ninth highest share in the EU.

Figure 62: Slovenian companies belong to the group of countries that have invested the least in climate change adaptation; at the same time, Slovenia has a high proportion of companies that do not plan to make investments in this field



Source: EIB (2022). Note: Countries are ranked by the proportion of companies that have already invested.

... and in the prevailing focus mainly on cost reduction and less on product differentiation, the use of advanced sustainable technologies and the innovation of sustainable business models. According to EMS (2022), 60% of the companies surveyed cite “cost savings” as the main reason for introducing circular measures, while 48% cite “legislative requirements”, and only 20% of companies cite “differentiation from the competition”. At the same time, data shows that companies are not innovating their sustainable business models intensively enough: only 6% of companies make extensive use of “industrial symbioses and/or the creation of new partnerships for value chains and networks”, 2% of companies offer their customers “result-oriented services”, while “sharing business models” are offered by only 1% of the companies surveyed (Palčič and Kovič, 2022). Somewhat more optimism for a possible improvement of the situation is given by the fact that a quarter of the companies partly use or make first attempts to use the concepts of industrial symbiosis and one-third of the companies surveyed already design products in such a way that they can be assembled, produced or recycled several times. At the same time, on average, only 4% of companies plan to implement circular economy measures by 2025 (ibid.), indicating the need to significantly accelerate the sustainable transformation of the business sector.

4.2.4

The gap between necessary investments and available resources

To achieve the climate and energy targets by 2030, annual investments of about 1.5% of GDP are needed at the EU level. According to estimates by the European Commission (EC, 2021), additional private and public investment of EUR 520 billion per year will be needed at the EU level by 2030. Increased investment needs in the energy and transport sectors would require EUR 390 billion per year due to the focus on decarbonisation and the energy and transport needs of a growing economy. The latter includes, among other things, investment in the electricity grid, power plants and industrial boilers, the production and distribution of new fuels, the insulation of buildings, energy refurbishment, the purchase of vehicles and more investment in transport infrastructure. Investments in other environmental areas, estimated at around EUR 130 billion per year, include needs in environmental protection, biodiversity, resource management and the circular economy. The needs assessment is considered conservative and does not include adaptation investments required due to exposure to expected future climate change and resulting natural disasters.

According to the Fiscal Council (2022), private and public investments to achieve climate and energy targets in the period 2016–2020 in Slovenia amounted to around EUR 5 billion. The largest share in the structure of funding sources were private funds (73.4%), followed by public funds (16.3%) and EU funds (10.2%). In many cases of private funds, institutions or funds were under the dominant influence of the State (especially investment funds of the electricity transmission system operator ELES and electricity distribution companies) or under the state-imposed incentives for RES and CHP¹⁷⁷ disbursed by Borzen, which is not classified as an institutional unit of the government sector. Private funds were also represented by the co-use of subsidies from the public Eco Fund. This shows how important the role of public subsidies and other incentives in mobilising private funds for green change was in the past and will continue to be in the future.

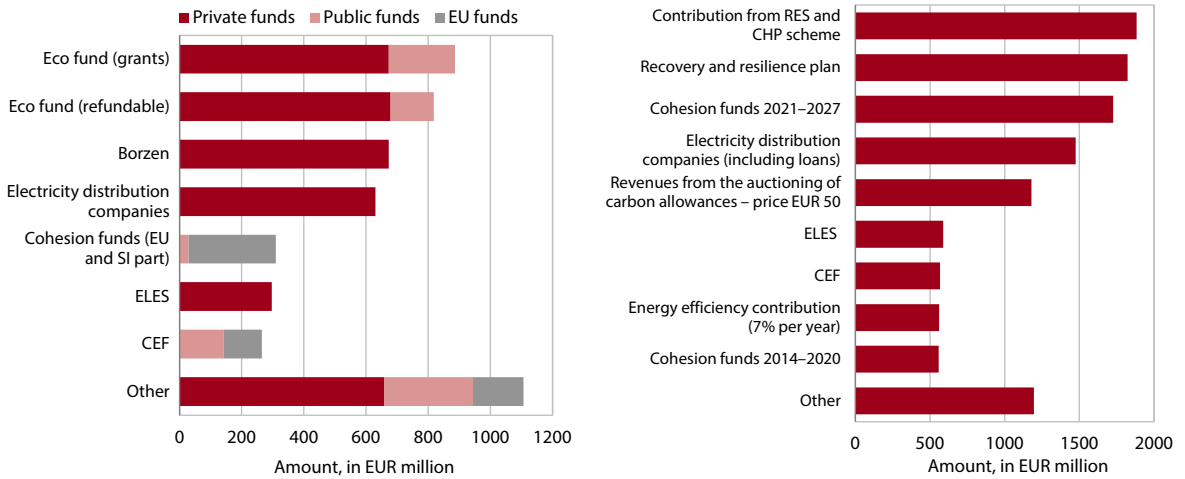
According to the Fiscal Council's estimate, the funds available to achieve energy and climate targets in 2021–2030 amount to EUR 11.6–12.3 billion, with the largest share coming from EU funds, indicating a financing gap, as the NECP¹⁷⁸ estimates the investment needed to achieve these targets at EUR 28 billion. The gap, however, is not insurmountable with additional government measures and the inclusion of investment potential from private sources. According to estimates based on data available to date, the dedicated funds will be much larger than in the past, partly due to the EU's new financial instruments. The projections of earmarked funds included in the estimate are subject to numerous assumptions and are therefore uncertain. Based on the estimate of available resources, the Fiscal Council (2022) prepared three scenarios of investment potential, depending on the inclusion of additional funds or measures, and each scenario provides for two further variants based on the assumption of the emission allowance price: (i) if the Eco Fund were to only finance grants with the expected revenue from the energy efficiency contribution¹⁷⁹ and investment potential were EUR 19.7–20.4 billion, there would be a gap of EUR 8.0–8.7 billion to the necessary investment volume identified in the NECP; (ii) if the taxes on CO₂ pollution actually become an earmarked resource, as envisaged in the NECP, the investment potential could increase to EUR 21.5–22.2 billion and the investment gap would decrease to EUR 6.0–6.5 billion; (iii) if the Eco Fund were to finance the grants also with all the envisaged revenues of the Climate Change Fund, this would achieve the greatest multiplicative effect of the collected dedicated resources and the investment potential would increase to EUR 23.4–26.3 billion and the investment gap would decrease to EUR 1.8–4.6 billion. In order to realise the last scenario, changes would have to be made in the manner of granting incentives and the staff capacities of the Eco Fund would have to be improved substantially, as the average annual volume of Eco Fund grants would be four to six times greater than the average of the 2016–2020 period.

¹⁷⁷ Slovenia has several sources of incentives for financing renewable energy (RES) measures, namely a support scheme for electricity from RES and CHP, incentives of the Eco Fund, investment aid for self-supply plants, European funds, and other budgetary resources.

¹⁷⁸ Around EUR 14 billion is needed for investment in buildings (of which almost two-thirds at the household level), around EUR 6.6 billion for investment in transport (most of it in rail transport), EUR 4.2 billion for investment in electricity distribution and EUR 3.5 billion for investment in all other areas.

¹⁷⁹ The energy efficiency contribution, similarly to the RES and CHP contribution, is paid by the end user of electricity, natural gas and heat from the grid and by the end user of solid, liquid and gaseous fuels.

Figure 63: The majority of funding sources for investments to achieve climate and energy targets in Slovenia in 2016–2020 came from private funds (figure left), while in 2021–2030 a large share of funding is expected from the RES and CHP scheme and from EU funds (figure right)



Source: Fiscal Council (2022). Notes: Other (figure left) integral state budget funds, Water Fund and the estimate of spontaneous household investments in energy performance of buildings financed by private funds, Horizon 2020 (EU and SI part), SID (green bond), EIB; Other (figure right) Eco Fund – refundable financial incentives, Just Transition Fund, Borzen – transfer, Horizon 2020, React-EU, SID (green bond) and Climate Change Fund – transfer.

The National Energy and Climate Plan is to be updated by 2024, with the measures and assessment of financial resources to be adapted to the more ambitious EU targets, which are also binding for Slovenia.

More ambitious targets to reduce greenhouse gas emissions by 2030 were set at the EU level (see Section 4.1.1) and efforts to reduce dependence on Russian gas were stepped up due to the war in Ukraine (see Section 4.2.1). To implement the proposed measures, additional funds will be made available under the REPowerEU plan, i.e. from untapped loans under the Recovery and Resilience Plan and from the sale of emission allowances, and from the possible reallocation of Cohesion Policy funds. As a result, Slovenia could receive more funding to support the green transition. On the other hand, it is unknown how the reduction in total RRP grants (by EUR 286 million) will affect the investment volume foreseen in the Plan to support the green transition. This year’s measures to limit rising energy costs have also resulted in fewer funds being collected from RES, CHP and grid fees, also this year’s solidarity allowances to mitigate the effects of energy price rises were partly covered by the Climate Fund. Thus the more ambitious decarbonisation targets and the possible decrease in funding for the green transition do not suggest that the gap in the necessary funds to finance the green transition by 2030 is narrowing.

The transition to carbon neutrality requires a focus not only on investment but also on broad-based economic policies that include price-based instruments, subsidies and standards that influence the behaviour of actors.

Although most environmental taxes are not earmarked for funding and achieving environmental goals,¹⁸⁰ their level is an important price signal. The recent reduction of environmental taxes in Slovenia does not reflect efforts to limit emissions – they fell from 3.9% of GDP in 2016 to 2.9% of GDP in 2021. At the beginning of 2022, excise duties were further reduced as part of the response to the surge in energy prices in 2021, which was exacerbated by the crisis in Ukraine in 2022, and price regulation of petroleum products was reintroduced. The tax reforms that led to a reduction of the tax

¹⁸⁰ Most of the revenues from environmental taxes are integral (unallocated) state budget revenues. Only some environmental taxes are earmarked, e.g. the proceeds from the sale of emission allowances that are channelled to climate change mitigation measures through the Climate Change Fund.

wedge on labour in 2019, 2020 and 2022 did not take advantage of the green tax restructuring opportunities, while various other tax incentives (subsidies and relief) were retained, which runs counter to the goals of reducing environmental impacts (IJS, 2020; MF, 2019). The NECP sets the goal of phasing out environmentally harmful subsidies and many other measures, although a clear timetable for implementation has not been set. Meeting climate and energy targets in the face of high investment needs and other measures is one of the biggest challenges for fiscal policy, which should also be addressed by an overhaul of economic governance and fiscal rules at the EU level.

4.3

Repercussions and recommendations for

4.3.1

The Government

Under the 2019 Green Deal, EU Member States have committed to achieving the goal of climate neutrality by significantly reducing greenhouse gas emissions, which primarily requires higher energy efficiency and use of renewable energy sources. National targets will have to be tightened due to the more ambitious EU targets. The planned reduction in GHG emissions will be achieved through higher carbon prices, the introduction of innovations and green technologies, sustainable mobility, and the phasing out of the most polluting brown activities. Much more support needs to be devoted to increasing energy efficiency and the use of RES, where the backlog is most severe. The provision of energy from local clean sources and its efficient use are also necessary in order to increase energy security. In the current energy crisis, a delay in the green transition is to be expected, but the key is to recognise and accelerate the opportunities for the necessary restructuring of the economy, as the systematic transition to a low-carbon circular economy is becoming increasingly difficult with the current delay or slow pace of change.

Interventions that weaken price signals to reduce fossil fuel consumption should be phased out, while the use of alternative energy sources should be promoted and capacity built to better manage vulnerability to price shocks. Unreliable supply and rising energy prices, exacerbated by the military conflict in Ukraine, have raised a number of new challenges related to addressing the energy crisis and the simultaneously planned green transition. Measures to limit price increases and reduce energy taxes do not lead to higher energy efficiency, increased use of renewable resources and energy savings, so they only make sense in situations of short-term shocks. Under conditions of longer-term challenges, it is necessary to accelerate the production of energy from renewable sources that replace fossil fuels and also to diversify sources in the transition period. Due to technological development and innovation, it is essential to increase energy efficiency while developing solutions for creating energy reserves and increasing their storage capacity.

Due to the limited natural resources and unreliable supplies, it is imperative to accelerate the transition to a circular economy. The success of the economy's green transition depends heavily on the reliable supply of limited natural resources, while shortage of critical raw materials and the resulting cost pressures increase the economy's vulnerability. Developing own capabilities and diversifying sources of supply in the value chain will be key to reducing existing strategic dependencies. At the same time, it will be necessary to intensively strengthen circular economy processes to reduce dependence on primary natural resources while promoting changes in consumption patterns, including a longer life cycle of products, and

waste prevention. The promotion of cross-sectoral cooperation and a coordinated approach involving all stakeholders will be of great importance.

The green transition poses a challenge for the restructuring of public finance policies to ensure sufficient public funds to support investment in advanced new technologies, energy retrofits of buildings and necessary infrastructure.

At the same time, it is important to focus on broader economic policies that include price-based instruments, subsidies and standards, which also play a very important role in mobilising private funds needed for the transition. All too often, the costs are perceived as clear and present, while the benefits as distant and uncertain, despite convincing research findings to the contrary. Given the high investment needs, the green transition is one of the biggest challenges related to fiscal policy restructuring.

A framework should be established to ensure ongoing active monitoring of coordinated sustainable development and assessment of the need for further measures.

To manage the transition, there is an urgent need not only to significantly increase awareness, but also to ensure a well-thought-out comprehensive monitoring framework. This will facilitate decision-making that promotes not only sustainable financing but also the full realisation of the enormous sustainable potential. The four dimensions of competitive sustainability, namely fairness, environmental sustainability, macroeconomic stability and productivity, require ambitious and coordinated policy-making. At the same time, comprehensive care for coordinated sustainable human resource development is of crucial importance.

4.3.2

The corporate sector

As the recommendations focus on the green transition with an environmental dimension, they focus on the introduction of a circular economy, but in the broader context of promoting sustainable development, i.e. also taking into account the social and economic dimensions.¹⁸¹

In the process of sustainable transformation of the business sector, it is important to take into account the **key features and assumptions of a successful green transition to a circular economy:**

1. Uncertainty and complexity, requiring a **comprehensive yet pragmatic and agile approach by pursuing multiple scenarios and considering more than just financial criteria in decision-making**, without which it would be more difficult to ensure a more ambitious acceleration of much-needed investment.
2. (Radical) **transparency (and traceability)**, both internal, at all levels, and external, towards all stakeholders, otherwise it is difficult, on the one hand, to expect a departure from “business as usual” and, on the other, to build trust in the brand or the company.
3. **Unprecedented pace of change and first mover advantage:** since change, especially disruptive change, is not linear, it will occur faster than most people expect, so pioneers can gain strong strategic advantages, which is also appreciated by consumers, especially representatives of younger generations.

¹⁸¹ For an overview of the literature, see, *inter alia*, Anderson and Caimi (2022), Bressanelli et al. (2022), Davis-Peccoud et al. (2022), Dufourmont and Goodwin Brown (2020), EC (2022b), Frame et al. (2022), Hedberg et al. (2019), IMF (2022), Kreibich et al. (2021), Krishnan et al. (2022), Lichtenau et al. (2022), Montag et al. (2021), OECD (2019a), Orebaeck (2022), Rejc Buhovac et al. (2018), Saenz et al. (2022), Schear et al. (2022), Tilbury, Merchant, Oh, Farley and Matyja (2022), Young and Reeves (2020), WEF (2021, 2022b), WMF (2021), Zaluaga Martinez et al. (2021)

4. **Paradigm shift with a long-term perspective, emphasis on values, mission and a changed mentality:** all this is increasingly becoming a crucial aspect of value creation for the consumer, which companies can only develop by changing their mindset and culture.

Basic measures and opportunities for the green transition to a circular economy:

5. **Definition of indicators for strategic control and definition of target values** at both the company and supply chain levels, taking into account the chosen sustainability strategy and risk exposure and consumer, legislative and market trends.
6. **Measures to promote the sustainability of products** with the use of sustainable and renewable materials, extension of life cycles, improvement of production processes, improvement of energy efficiency, reduction of material consumption and waste, inclusion in material flows, etc.

Innovation upgrade with a comprehensive redesign of the company's strategy and business model:

7. **The integration of digital and green transformation based on the innovation of sustainable business models** in line with the new paradigm of the smart circular economy, where business strategy, sustainability and digitalisation complement each other, enabling new forms of competition and value creation, for example based on servitisation or shared business models.
8. **Ensuring sustainability and circularity is not possible without an ecosystem approach throughout the value chain** (e.g. through traceability). At the same time, working with the broader business ecosystem is also a way to encourage experimentation and innovation, which is critical for addressing climate change.
9. The transition to a smart circular economy requires a **comprehensive redesign of the processes and organisation of companies** and other organisations within the ecosystem, both in terms of defining new responsibilities and adapting internal processes, for example in the context of sustainable controlling or improving existing key performance indicators (KPIs), and for example in terms of finding new, different, even disruptive solutions based on multidisciplinary, human-centred design.

Empowerment,¹⁸² privacy and security:

10. The green and digital transformation will be reflected in the changing content and structure of jobs, requiring **intensive (re)training with accelerated investment in human resources**. Changed and upgraded skills are not only important for highly qualified employees and decision-makers (e.g. for the introduction of a different management style), but also at all other levels and especially for the less qualified.
11. Business ecosystems supported by full traceability and transparency require, among other things, the aggregation of data, which in the interest of value creation must of course be supported by appropriate advanced analytical and decision-making models and applications. This not only raises the **issue of cybersecurity and privacy**, but also, for example, questions related to the integrity and ethics of artificial intelligence algorithms.

¹⁸² Empowerment here refers to encouraging individuals who are equipped with the necessary knowledge and skills to take individual responsibility for improving the way they do their work and thus contribute to the achievement of organisational goals (adapted from TERMIS: Terminology Database of Public Relations – Faculty of Social Sciences of the University of Ljubljana).

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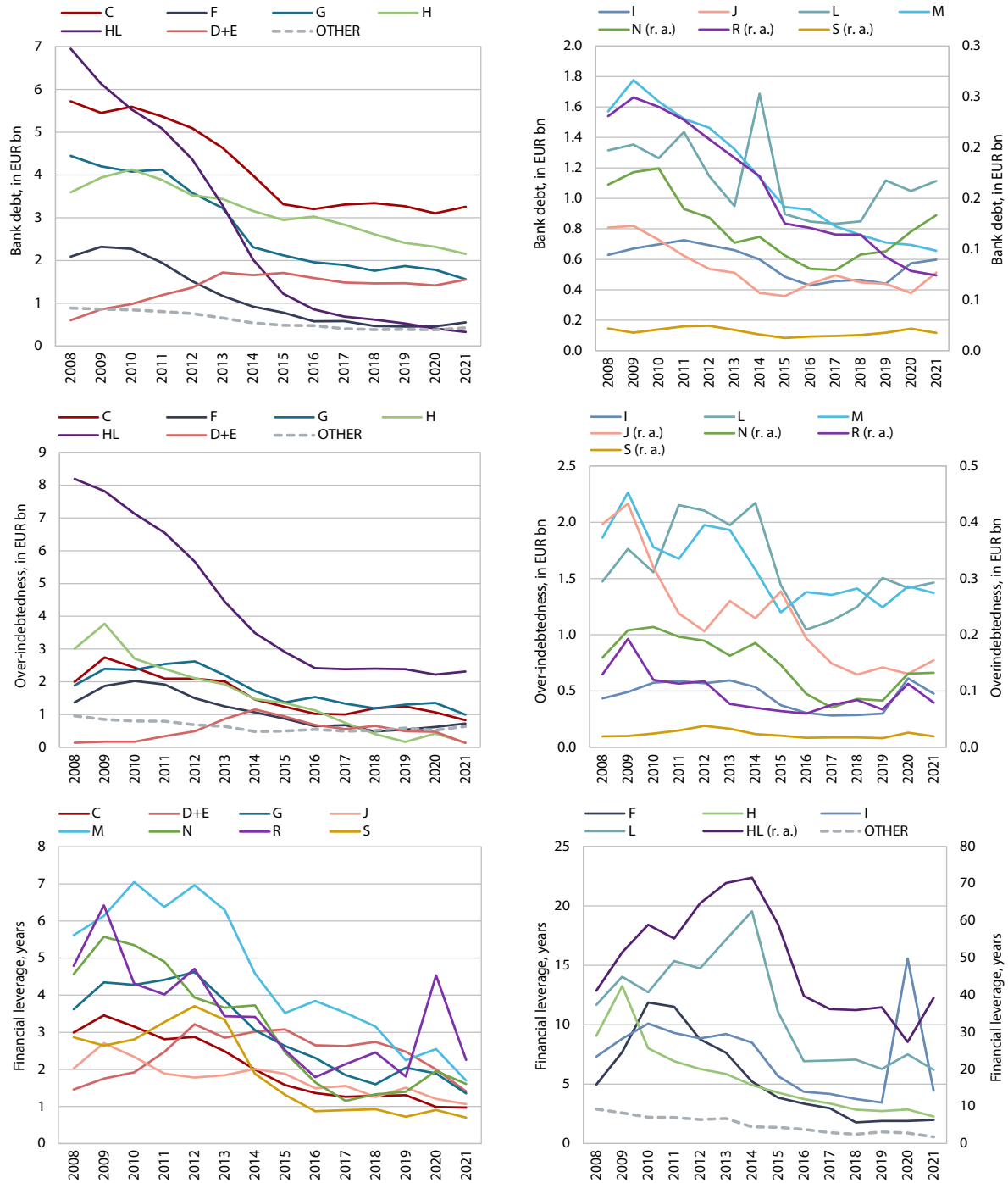
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Appendix Financial operations of companies – a more detailed presentation

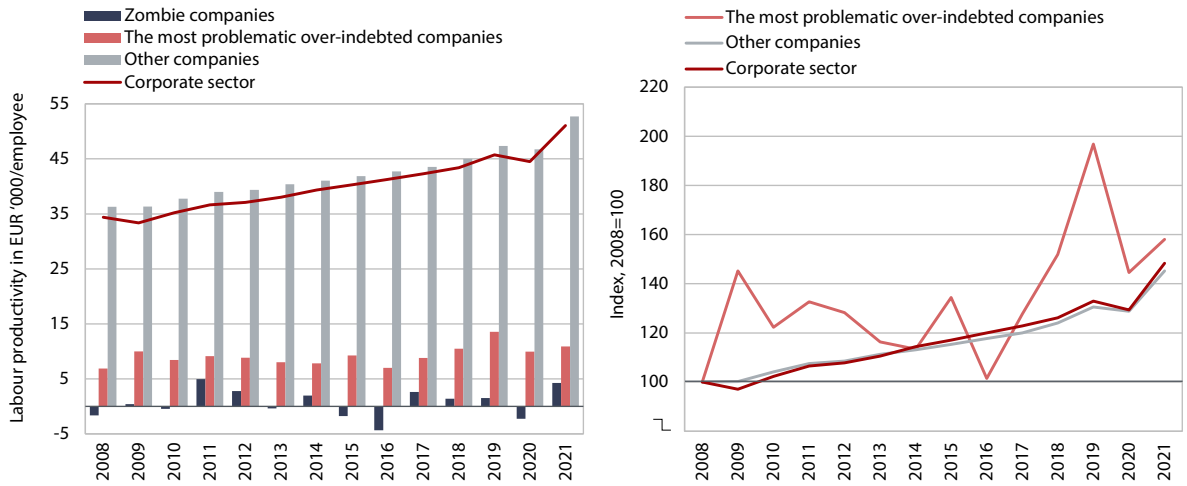
Figure 1: During the COVID-19 epidemic, bank debt, financial leverage and over-indebtedness increased mainly in market services



Source: AJPES (n.d.-b); calculations by IMAD. Note: Financial leverage – Net financial debt/EBITDA, which shows the ability to repay debt and how many years it would take for a company to pay back its debt and interests (assuming that net financial debt and EBITDA are held constant); Over-indebtedness – net concept; OTHER – A, B, part of K, O–Q;¹⁸³ r. a. – right axis.

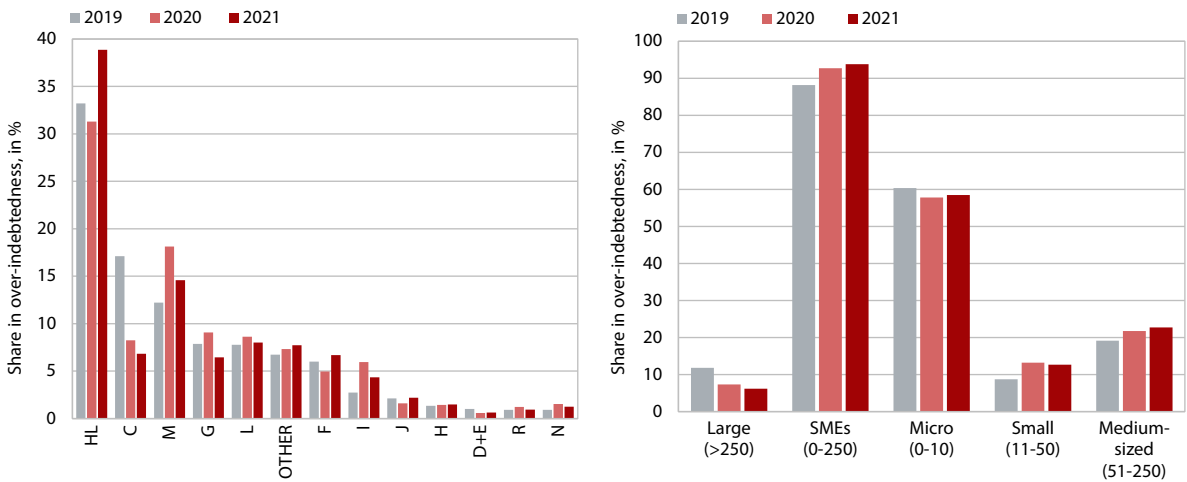
¹⁸³ For details, see the Standard Classification of Activities 2008 (Braunsberger et al., 2010).

Figure 2: Low productivity of companies that are relatively highly exposed to the risk of insolvency



Source: AJPES (n.d.-b); calculations by IMAD. Note: for the sake of clarity, the figure on the right does not show the productivity growth of zombie companies, as their growth is too volatile. The most problematic over-indebted companies have a net financial debt and negative EBITDA; zombie companies (belonging to the group of the most problematic over-indebted companies) have a net financial debt and negative EBITDA for at least three consecutive years, so the data are only available from 2008 onwards.

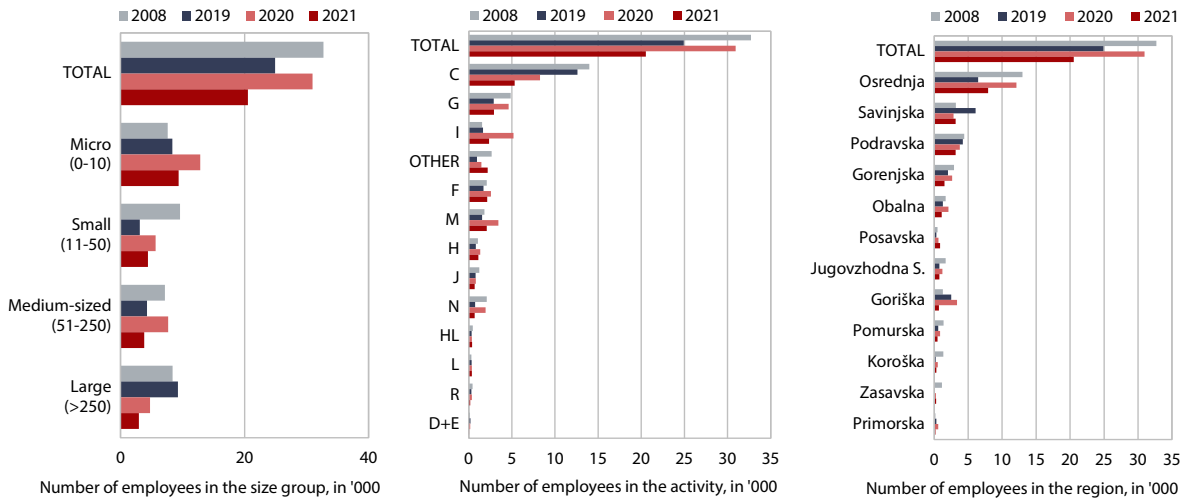
Figure 3: During the COVID-19 epidemic, over-indebtedness of the most problematic over-indebted enterprises has increased in SMEs, certain market services and construction



Source: AJPES (n.d.-b); calculations by IMAD. Note: SMEs – micro, small and medium-sized enterprises; OTHER¹⁸⁴ – A, B, part of K, O–Q, S, T.

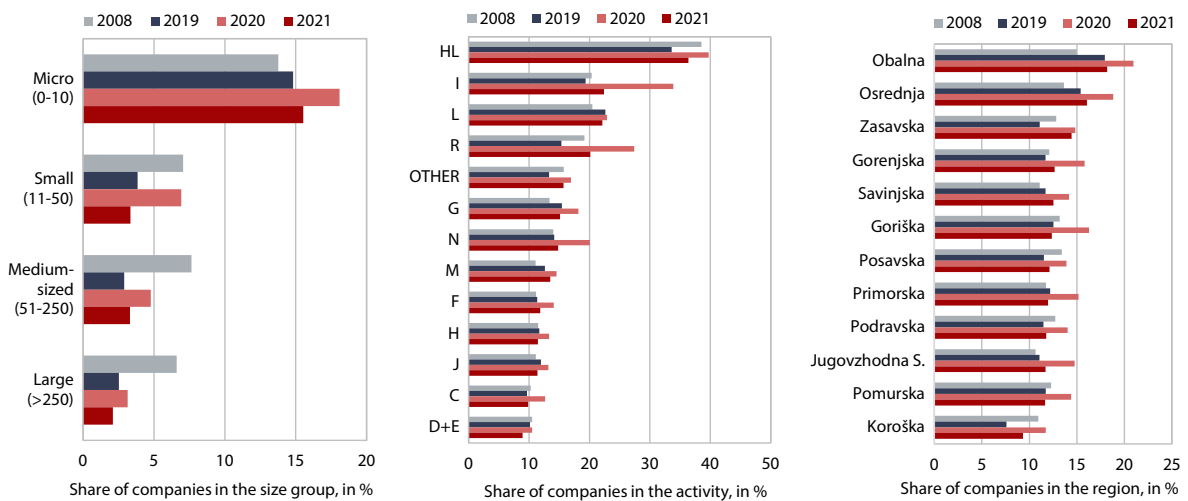
¹⁸⁴ OTHER (A, B, part of K, O–Q, S and T) – In analysing the structure of over-indebtedness, other service activities – S are included in the OTHER category, as its share of the total over-indebtedness only accounted for 0.2% despite the activity being affected during the epidemic.

Figure 4: Number of employees in companies with a relatively high insolvency risk by size, activities and regions



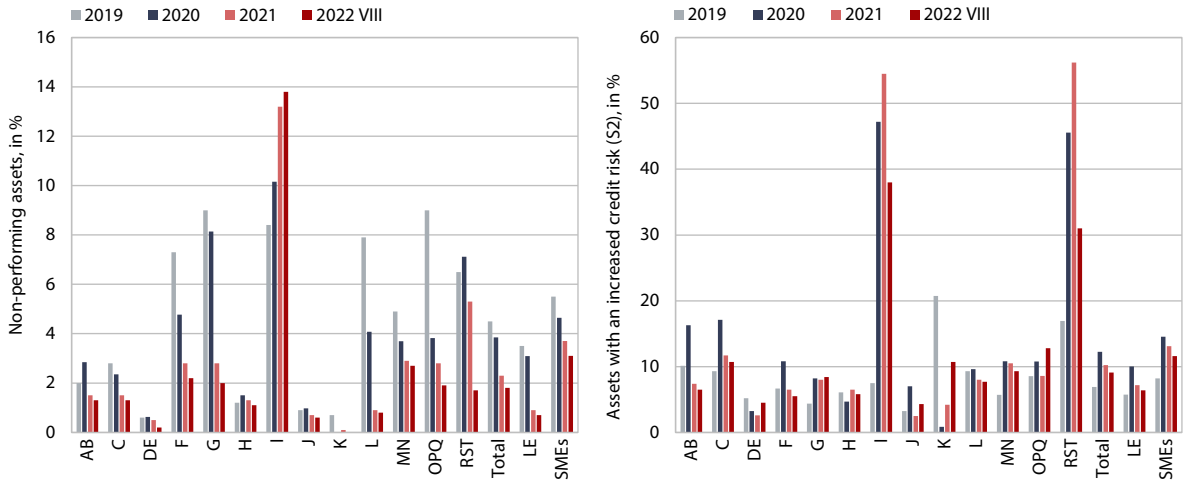
Source: AJPES (n.d.-b); calculations by IMAD. Note: OTHER – A, B, part of K, O–Q, S, T; Obalna – Obalno-kraška; Osrednja – Osrednjeslovenska; Primorska – Primorsko-notranjska; Jugovzhodna S. – Jugovzhodna Slovenija.

Figure 5: In 2021, the share of companies with a relatively high risk of insolvency was the highest in SMEs, in terms of activities in holding and leasing companies and in the most affected market services and by region in the Obalno-kraška, Osrednjeslovenska regions



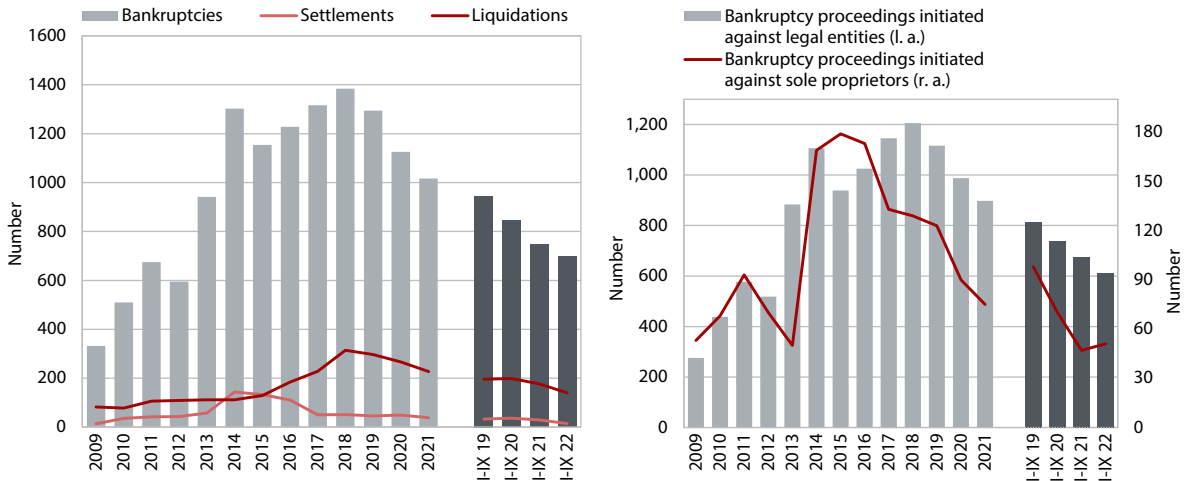
Source: AJPES (n.d.-b); calculations by IMAD. Note: OTHER – A, B, part of K, O–Q, S, T; Obalna – Obalno-kraška; Osrednja – Osrednjeslovenska; Primorska – Primorsko-notranjska; Jugovzhodna S. – Jugovzhodna Slovenija.

Figure 6: The share of non-performing assets and claims against companies with significantly increased risk is still low; there are increased risks in accommodation and food service activities and in certain other services



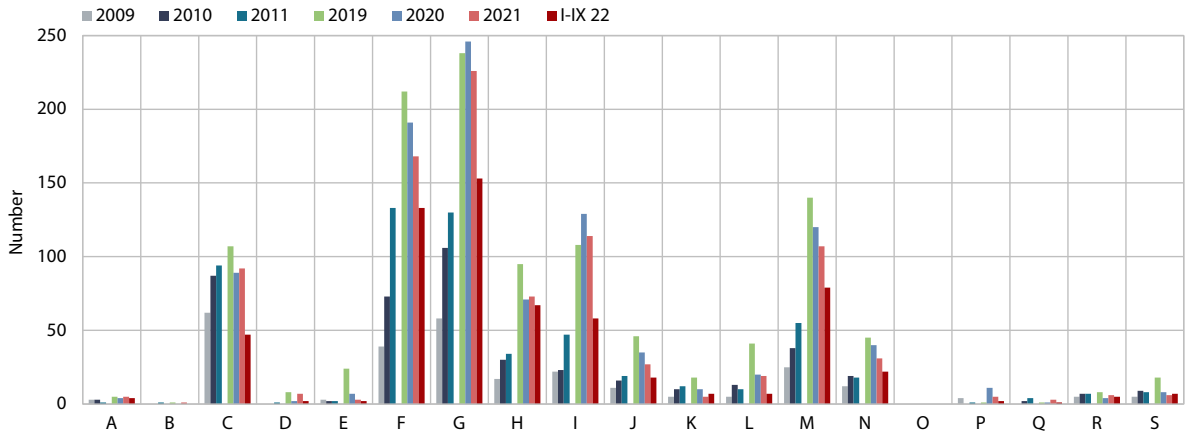
Source: BoS (2022b). Note: LE – large enterprises, SMEs – micro, small and medium-sized enterprises.

Figure 7: Number of insolvency proceedings initiated against all business entities (left) and number of bankruptcy proceedings initiated against legal persons and sole proprietors (right)



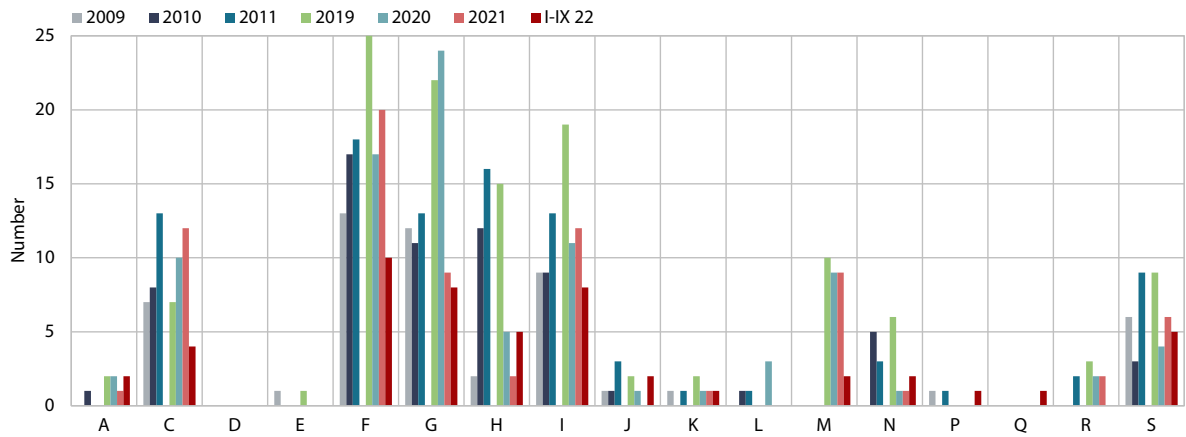
Source: AJPES (n.d.-a). Note: l. a. – left axis; r. a. – right axis.

Figure 8: Number of bankruptcy proceedings initiated against companies, by activity



Source: AJPES (n.d.-a). Note: For 2022, only data for the first nine months are available.

Figure 9: Number of bankruptcy proceedings initiated against sole proprietors, by activity

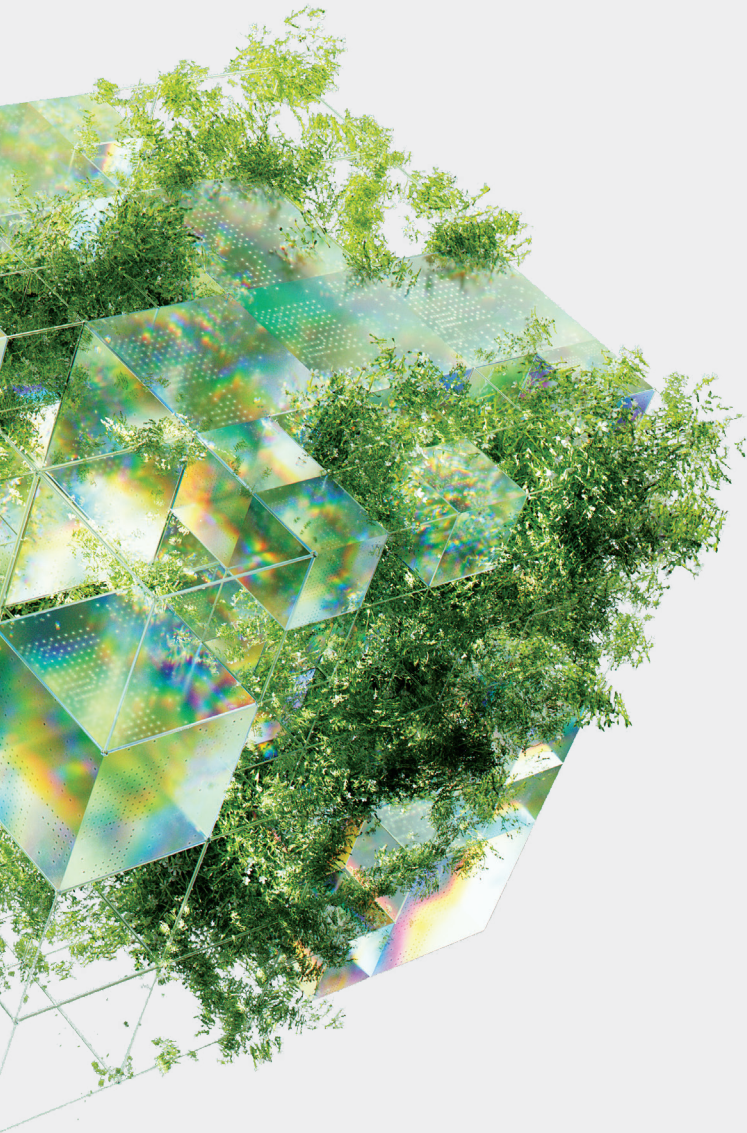


Source: AJPES (n.d.-a). Note: For 2022, only data for the first nine months are available.

Acronyms

AJPES	Agency for Public Legal Records and Related Services
AOP	Item in financial statements (balance sheet and profit and loss statement)
ARRS	Slovenian Research Agency
BBHZD	Act Ratifying the Agreement between the Government of the Republic of Slovenia and the Council of Ministers of Bosnia and Herzegovina on the Employment of Citizens of Bosnia and Herzegovina in the Republic of Slovenia and the Protocol on the Implementation of the Agreement between the Government of the Republic of Slovenia and the Council of Ministers of Bosnia and Herzegovina on the Employment of Citizens of Bosnia and Herzegovina
BoS	Bank of Slovenia
CEDEFOP	European Centre for the Development of Vocational Training
CHP	Combined heat and power
DIH	Digital Innovation Hub Slovenia
EBITDA	Earnings before interest, tax, depreciation and amortisation
EC	European Commission
ECB	European Central Bank
ECRE	European Council on Refugees and Exiles
EE	Energy efficiency
EIB	European Investment Bank
EII	European Innovation Index
EMS	European Manufacturing Survey
EP	European Parliament
ESS	Employment Service of Slovenia
EU	European Union
EUR	Euro
Eurofound	European Foundation for the Improvement of Living and Working Conditions
Eurostat	Statistical Office of the European Union
FDI	Foreign direct investment
GDP	Gross domestic product
GEM	Global Entrepreneurship Monitor
GHG	Greenhouse gases
GVCs	Global value chains
IAE	Innovation-active enterprises and innovation activity of enterprises
IC	Interest coverage (EBITDA/interest expenses)
ICT	Information and communication technologies
IJS	Jozef Stefan Institute
IL (Innovation Leaders)	Belgium, Denmark, Finland, Netherlands, Sweden
IMAD	Institute of Macroeconomic Analysis and Development
IMD	Institute for Management Development
IMF	International Monetary Fund
ITR	Implicit tax rate
IZS	Slovenian Chamber of Engineers
MDDSZ	Ministry of Labour, Family, Social Affairs and Equal Opportunities
MF	Ministry of Finance
MIZŠ	Ministry of Education, Science and Sport
NACE	Standard Classification of Activities
NACE A	Agriculture, forestry and fishing
NACE B	Mining and quarrying
NACE C	Manufacturing

NACE D + E	Energy
NACE D	Electricity, gas, steam and air-conditioning supply
NACE E	Water supply, sewerage, waste management and remediation activities
NACE F	Construction
NACE G	Wholesale and retail trade, repair of motor vehicles and motorcycles
NACE G-N, R-T	Non-financial market services
NACE H	Transportation and storage
NACE I	Accommodation and food service activities
NACE J	Information and communication
NACE K	Financial and insurance activities
NACE L	Real estate activities
NACE M	Professional, scientific and technical activities
NACE N	Administrative and support-service activities
NACE O	Public administration and defence, compulsory social security
NACE OPQ	Public services
NACE P	Education
NACE Q	Human health and social work activities
NACE R	Arts, entertainment and recreation
NACE S	Other service activities
NACE T	Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use
NACE U	Activities of extraterritorial organisations and bodies
NECP	National Energy and Climate Plan
OECD	Organisation for Economic Co-operation and Development
PPS	Purchasing power standard
RES	Renewable energy sources
REER hicap	Real effective exchange rate deflated by the harmonised index of consumer prices
REER ppi	Real effective exchange rate deflated by the industrial producer price index
REER ulc	Real effective exchange rate deflated by unit labour costs
R&D	Research and development activity
RRP	Recovery and Resilience Plan
SID	Slovene Export and Development Bank
SMEs	Small and medium-sized enterprises
SRDAP	Statistical Register of Employment
SURS	Statistical Office of the Republic of Slovenia
TFP	Total factor productivity
ULC	Unit labour costs
V4 (Visegrad Group)	Czech Republic, Hungary, Poland and Slovakia
WEF	World Economic Forum
ZTuj	Foreigners Act



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