

The Future of Rural Manufacturing

Case Study of Slovenia



The future of rural manufacturing: Slovenia case study

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The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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Box 2.1. Main takeaways and policy recommendations Slovenia case study

Main findings

The Slovenia case study focused on the three TL3 regions of Koroška, Goriška Podravje. The analysis combined desk research and fields trips to the regions as well as meeting with national policymakers, revealing a number of findings. The analysis combined desk research and fields trips to the regions as well as meeting with national policymakers, revealing number of findings. A key point relates to the Slovenian national priorities for industrial strategy policy that focus on green, creative and smart objectives. This banner covers a wide range of elements spanning from digitalisation to internationalisation and smart specialisation.

The case studies highlighted a few challenges, which if tackled effectively could strongly boost the performance of the manufacturing sector and regional development. They include:

- **Improving multi-level governance:**
 - Regions want their regional development plans to be heard systematically and effectively. Whilst technically formal channels exist, their mechanisms are unclear and underutilised. Thus, an effective process would be highly beneficial.
 - There are no meaningful **integrated** strategic documents and there is a significant lack of coordination capacity and oversight. Every ministry and region has its own approach at the national level even if often the goals are overlapping. The new restructuring of ministries since the field visits aims to advance in this front.
 - There is room to better integrate and align regional development policy and rural policy.
 - Vertical and horizontal cooperation should be improved in order to encourage collaborative strategies and goal-setting between all kind of actors – public institutions, research and academia, businesses, among others. There is room for improvement for regional development agencies to converse with national bodies.
 - On some occasion, bureaucracy was identified as a bottleneck in the development of projects, both publicly (roads) and entrepreneurially (lands).
- **Challenges related to companies** such as:
 - Skills shortages driven partly through depopulation in some regions due to their lack of attractiveness to the young, educated workforce. However, there is a strong role for companies themselves to improve attraction including through non-financial company incentives and by upgrading and replacing routine tasks with automation to make use of the higher educated workforce.
 - Labour shortages also require a more flexible education system.
 - Although there are sufficient resources available for R&D and innovation activities, more can be done to incentivise a culture and open model of innovation through widening the economic base of participants in the schemes.
 - Business zones that could be better operationalised and **managed**.
 - Insufficient valorisation of local value chains in products of competitive advantage (agri-food industry)
 - strengthening networking between stakeholders from different industries in local areas (farmers, HoReCa, distributors, retailers...) and inter-industry organisations.
- **Infrastructure related issues**, particularly the lack of connectivity, remain a regional problem that is often highlighted including:

- Granting of planning both for housing for (immigrant) workers and for development of businesses.
- Transport infrastructure which makes logistics particularly difficult, specifically road improvements and a need for revamping railway lines to increase the movement of people and goods in the relatively small country.
- Improve advertisement of high wellbeing standards that exists including cycle paths and tourism infrastructure that can improve the attractiveness of the rural areas for people to live.
- Management of water and protected areas could be improved.
- Globally, regions would like the national governments to take into consideration the following suggestions to common **challenges**:
 - To give continuity to projects and activities after they are financially supported by EU funds.
 - To have a wider strategic view on the education system and links to university hubs and talent centres that consider future developments such as the rise in artificial intelligence.
 - To better interlink the different innovation hubs (parks, centres, incubators) to ensure they are not fragmented and can take on the advantages of the innovation ecosystem developed.
 - Help promote the concepts of ecoregions (green industry, green agriculture and food production, green tourism). An example that can be further replicated is the current scheme for medium-sized farms who can apply for all investment interventions and receive support in the form of grants of up to 50%, and up to 75% for investments that have a beneficial effect on the environment.
 - Help link manufacturing sectors to the wider sustainable tourism industry to create more value added in its activities.
 - To build further the cross-border cooperation/development to reduce the current gap across borders and retain the high skilled labour that are currently moving out.

Despite the above-mentioned challenges, the regions still have great **assets, potential and opportunities** that are often mentioned through their regional development programs:

- Slovenian industrial champions are international, innovative, and performing strong. Spin offs that create new companies around them is a strong asset of the regions. In manufacturing there are niches that could be even better explored and increase competitiveness by seeking alternative programmes.
- The high quality of life present in the regions is a key pillar of regional attractiveness. The outdoors pursuits, the fresh air, and other assets in terms of quality of life, are often enviable and some firms are leaning into this.
- Middle sized farms have the biggest potential. Young educated farmers taking over their farms can benefit from schemes such as “intergenerational transfer of knowledge”- where the transferee transfers knowledge for three years after the handover the farm to the new generation and receives payment for this knowledge transfer. It has been seen such farmers then engage in moving along the value chain and engaging effectively in manufacturing activity.
- Slovenians are attached to their regions and even when they leave to cities in search of better job opportunities they are often actively seeking opportunities to return. This attachment must be capitalised upon.

Main Recommendations

The case studies identify a number of broad recommendations for Slovenia as a whole as well as recommendations for each of the three regions across a number of areas. These are summarised in the following table:

Summary of policy recommendations

Area	Broad comment	Goriška	Podravje	Koroška
Skills	Match existing efforts to attract talent with efforts to improve employer demands to align with the future direction of the sector.	Continue the utilisation of S4 to consider education programs to develop. Prevent early leaving of education on vocational and professional secondary education through increased interactions with local businesses through e.g., high school internships.	Retain the highly skilled, sectoral relevant workforce already successfully nurtured through scientific institutions in the region by improving the non-financial offers of local firms and encouraging the moving up of firms, particularly of SMEs.	Continue to build on R&D cooperation between universities and SMEs. When implementing policies for inclusive employment, consider strategically both current training allocations e.g., build on health centre research for low skilled social employment in the sector and digital skills for disincentivized youth etc. in the manufacturing sector. Encourage commuting from within Slovenia with greater opportunities to occasional remote work etc.
Green economy	Consider equally the inputs (e.g., green energy), operations and products (e.g., strategic orientation of regional economic outputs).	Explore further the potential wind power as an energy source. Make better use of the woodland economy as a strategic sector.	Explore further the potential solar power as an energy source. Consider examples from other OECD cities to tackle water governance concerns. Use LEADER initiatives to highlight the benefits and methods of green transitioning to small farmers.	Explore further the potential of solar power as an energy source. Use LEADER initiatives to highlight the benefits and methods of green transitioning to small farmers. Attempt to reduce mining processing outputs. Beyond wood, consider the green production of its S4 sectors e.g., ICT.
Land use	Work across levels of government to have a clear vision that matches sectoral ambition with spatial planning to reduce the currently substantial planning permission delays.	Work in greater collaboration with neighboring regions for solutions on migrant housing, who likely do not have the same cultural aversion to commuting. Formulate a clearer long-term strategy of spatial planning.	Better management of the business districts could help alleviate some spatial planning concerns whilst coordinating visions with the National spatial planning agency is ongoing.	In addition to orientating to less land intensive ICT sectors, consider just as rigorously land use availability for more circular manufacturing.
SME access to capital	Improve the knowledge of existing funds to a wider set of SMEs. Encourage utilisation of funds through building a greater entrepreneurial culture and noting the risk sharing between public and private.			
Clustering and networks	Make more use of existing networks.	Consider limiting the number of sectors prioritised to provide the best service to the limited few.	Link more explicitly the work from the universities and hubs to the existing rather than forthcoming industries.	Use the knowledge hub as a location to test disruptive innovation policies through the implementation of a regulatory sandbox.
Digital and Physical infrastructure	Ensure good infrastructure to make the most of the digital goal in the industrial strategy.	Consider rail lines. Focus on improving digital infrastructure which ranks poorly within Slovenia and across the OECD.	Rethink the benefits of an airport and direct funds to form more direct infrastructure to GVC target regions across EU.	Consider using the old trainlines for trains as well as tourism. Co-ordinate with national levels in reducing further delays of

				the highway
Market orientation	Consider different strategies for firms at different points of the productivity distribution.	Build stronger cross border co-operations with Italy and leverage the cultural and heritage manufacturing industry.	Formulate a supply chain directory to aid investment activities and better monitor the benefits from FDI-SME linkages.	Increase collaborations with Austria to share lessons and increase tradable activities particularly relating to the development of the wood sector
Regulation	Consider reducing gold plating, find a balance between flexible regulation and continued accessibility for local levels and firms			
Multilevel governance	Change the dynamic from co-operation focused on projects to co-operation focused on strategies. Work closely across levels of government to tackle alternatives to EU funding to reduce delays and gaps			

Source: Authors elaboration

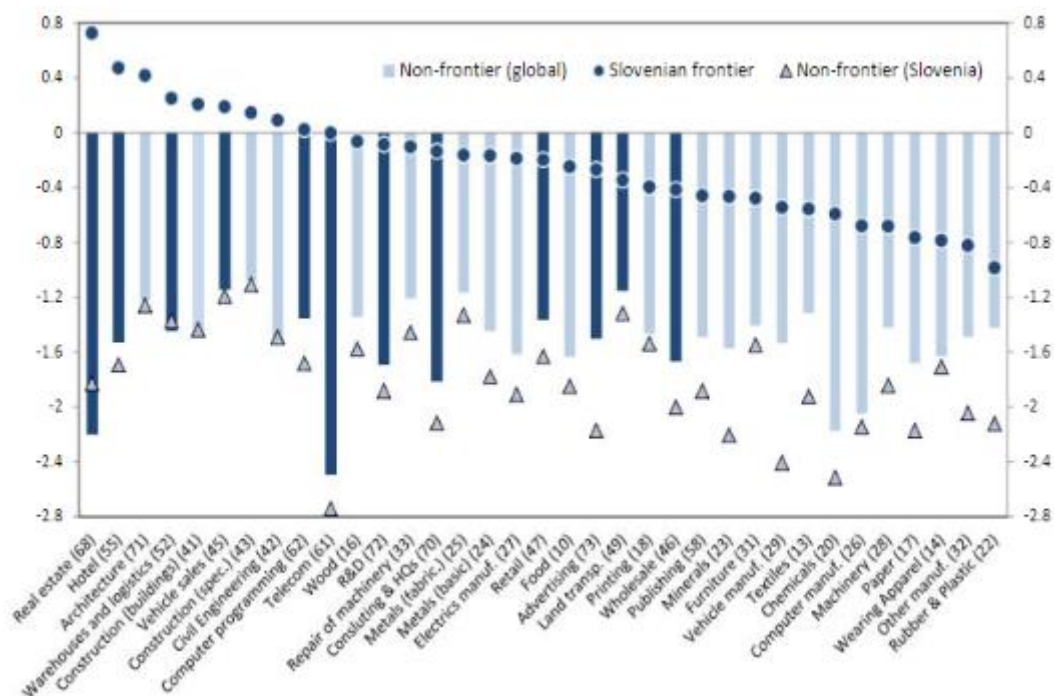
2 A brief overview of the landscape

Introduction

1. Slovenian industrial strategy has over the decades focussed, rather successfully, on attracting foreign investment in high technology industries such as electronics, pharmaceuticals, automotive and aerospace. Through the promotion of innovation and technology transfer as well as investment in infrastructure and education, it has built a plethora of national champions. The geographical distribution of the density of these success stories however is not equal. Earlier periods of transition saw a rise in inequality between urban and rural areas and many rural areas experienced declines in populations. Through various EU funds, Slovenia has actively focused on improving the quality of life in rural areas through initiatives such as improving rural healthcare, education, and transport services. Today, whilst these disparities have decreased and Slovenia performs well in indicators such as employment rates, its overall global competitiveness is stagnating. In addition, with more recent challenges such as rising energy costs and consequences of COVID-19 a new approach that effectively utilises its resources across its various regions can help Slovenia achieve its potential and simultaneously reduce regional inequalities. This report focuses on the future of rural manufacturing and how it can be an engine for prosperity in rural areas and a home for national champions. Specifically, this report will look at three case study regions Goriška, Podravje and Koroška, providing analysis and recommendations to help achieve this objective. For ease of access, each section concludes with a key takeaways box.

Figure 2.1. Slovenia does not appear to have firms that operate close to the global frontier in manufacturing

Long multi-factor productivity gaps between the global and national frontier (top 10% of firms within 2-digit sector)



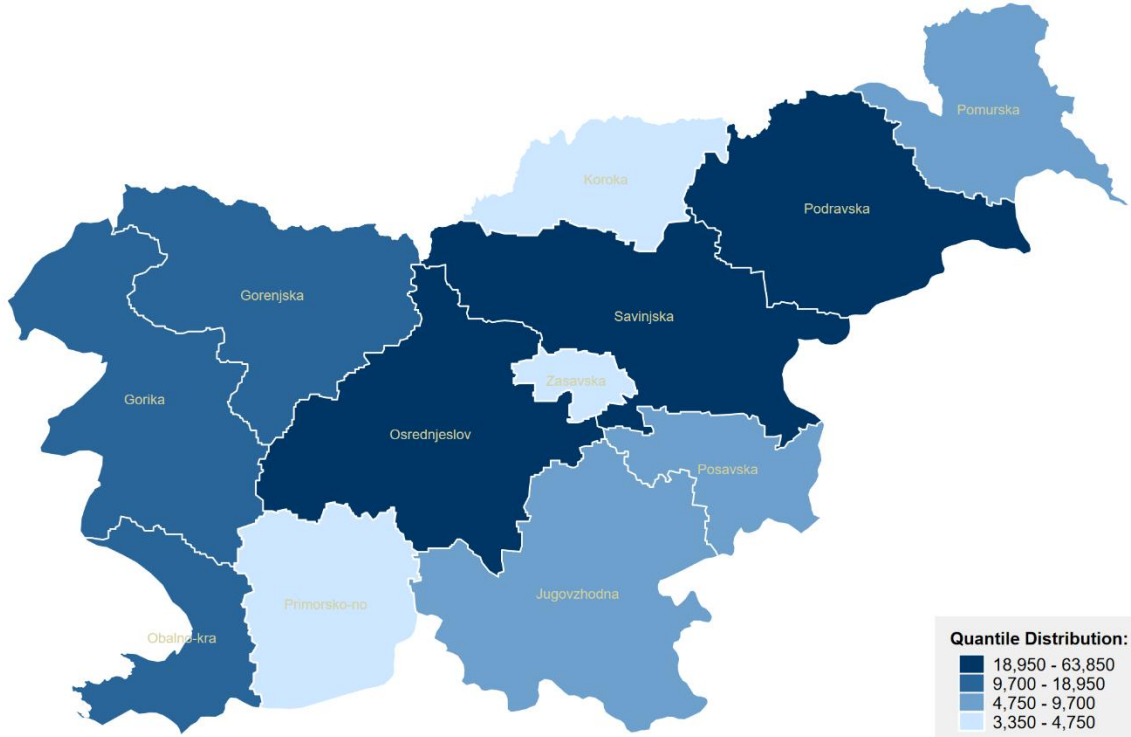
Note: All values are measured as differences in the median log multi-factor productivity levels between the top 10% of global firms (global frontier), within each 2 digit- sector that has at least 3 frontier firms in Slovenia. NACE Rev 2. Industry codes (2- digit) are in parenthesis. Industries are ranked in increasing distance of the Slovenian frontier from the global one. Dark columns indicate service sectors.

Source: *Slovenia Development strategy 2030: Prospects, challenges and policy options to achieve the main objectives*, OECD, 2019.

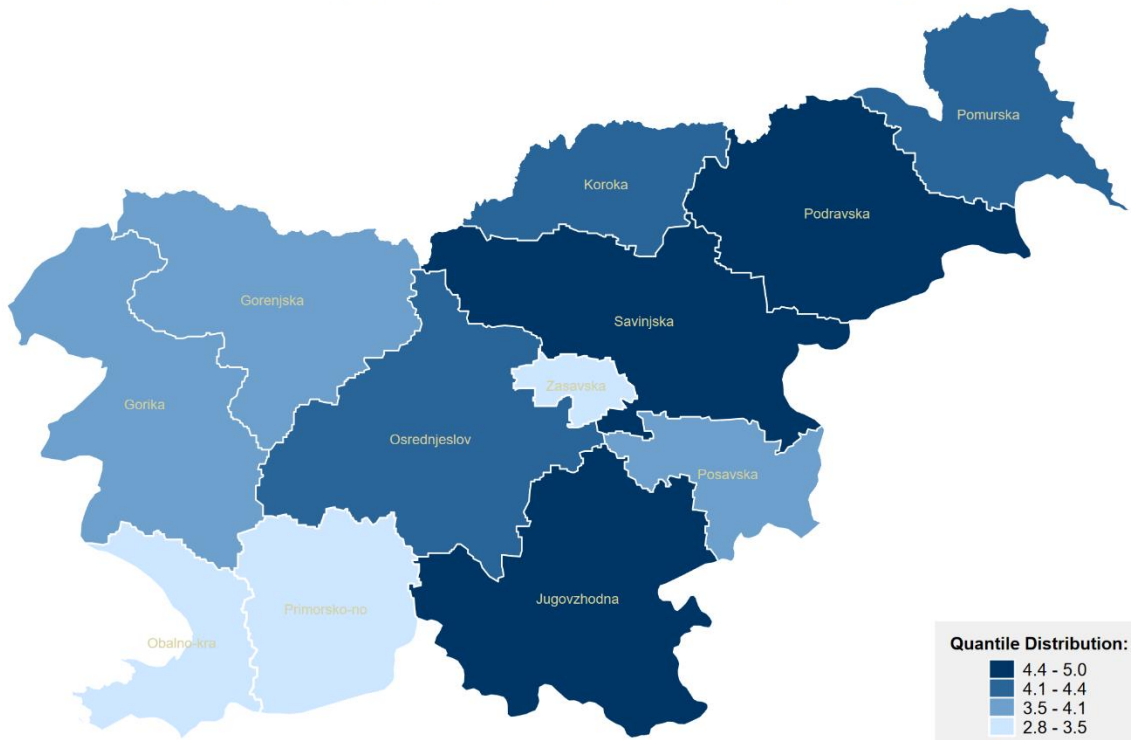
Figure 2.2. The distribution of enterprises in Slovenia show rather large geographical differences

Population of enterprises and number of persons employed per enterprise TL3, 2020

Population of Enterprises in Slovenia by NUTS3 (2020)



Number of Employed per Enterprises in Slovenia by NUTS3 (2020)



Source: [Statistical Office of Slovenia \(SiStat\)](#): Table "1418403S"

The outline

2. To better understand which regions are particularly specialised in manufacturing and how manufacturing evolved in these places (direction of growth and decline) a classification was developed using the OECD typology of degree of urbanisation (see Box 2.1). An overview of all classification covering different types of manufacturing and non-manufacturing hubs across Slovenia is shown in the infographic below.

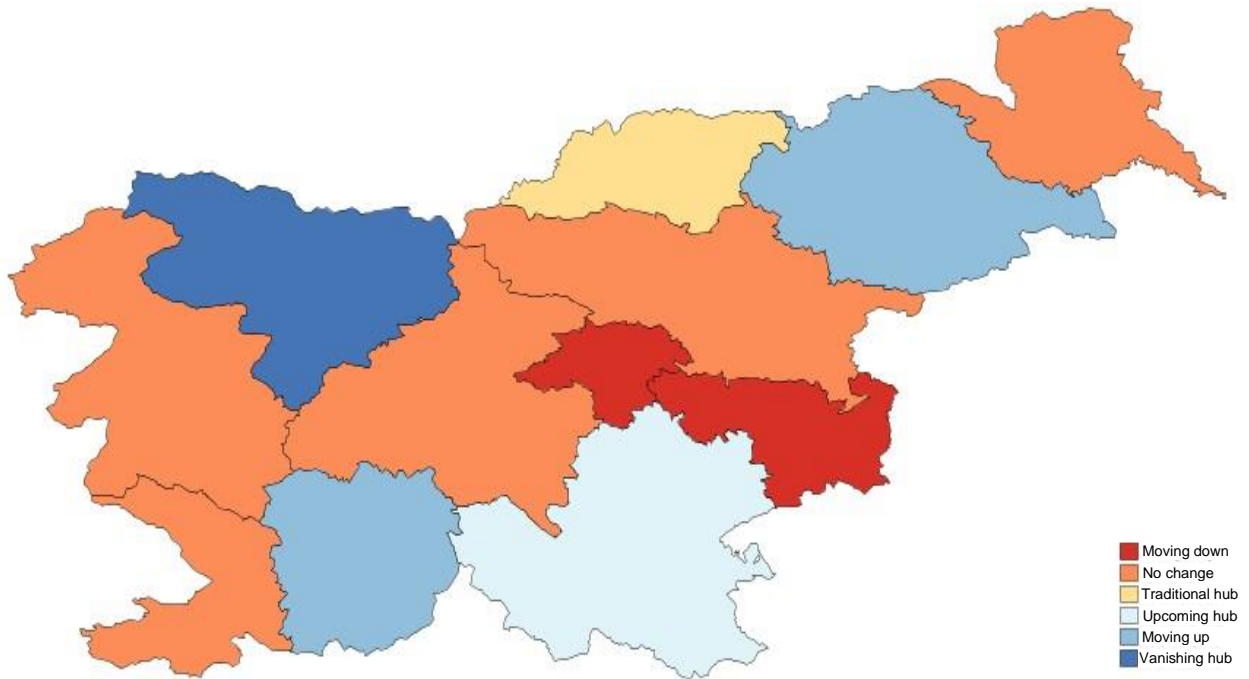
3. The region of Podravje, although with many rural aspects, with regards to the OECD typology it is considered a medium sized metropolitan region. It is a region that has seen an increase in manufacturing over the last 20 years. The region is home to several important industries, including paper production and developing interests in pharmaceuticals, and automotive manufacturing. A larger share of Podravje's economy is focused on the service sector and limitedly but relatedly on agriculture (63.7% and 2.5% of regional GVA in 2021 respectively) mainly through tourism particularly with the rise of wine tourism. Geographically, Podravje is a region located in the north-eastern part of Slovenia, bordering Croatia and Austria. The region is named after the river Drava, which flows through it, and covers an area of around 3,700 square kilometres. With the town of Maribor at its heart, the region is characterized by its diverse landscape, which includes the Pohorje mountains and the Drava River valley. Podravje is characterized by its fertile soil, which makes it an important agricultural region.

4. Koroška on the other hand is a non-metropolitan rural remote region that has been a traditional manufacturing hub for several decades, being a region in the top quintile of manufacturing employment in Slovenia over this time period with a particular focus on wood, metalworks and more recently, electronics. Koroška lies between Karavanke, Kozjak and Pohorje and consists of three valleys: Dravska, Mežiška and Mislinjska valley and it has an area of 1,041 square kilometres which makes it one of the smaller regions in the country. Bordering Austria and Italy, it is characterized by a rich cultural heritage including traditional music, dance, and dress and natural beauty, which attracts tourists from all over the world contributing to having over a third of its employment in the service sector.

5. Goriška is defined as a non-metropolitan region close to a small city and has been somewhat involved in the manufacturing sector over the last 20 years with limited change in its' share of employment in manufacturing relative to other regions in Slovenia. Based in the west of the country, it is considered a sell – off region with many economic indicators above the Slovenian average. Historically the region was an important trade route between Venice and central Europe. The region's economy is based on a mix of agriculture, tourism, and manufacturing, with a focus on high-tech industries and renewable energy. The region is also known for its wine production, and its wines are exported to countries around the world.

Infographic 2.1. Rural Manufacturing in Slovenia by manufacturing type

Change in manufacturing employment between 2000-2018, TL3



Note: Colours derived from typology developed by authors see Box 2.1.

Source: Authors' elaboration based on the OECD Regional Database <https://doi.org/10.1787/region-data-en>, (last access: April 2022).

Box 2.1. OECD typologies

1. OECD typology of on degree of urbanisation

Non-metropolitan TL3 region, if less than 50% of its population live in an FUA (Functional Urban Area). These regions are further classified according to their level of access to FUAs of different sizes into regions:

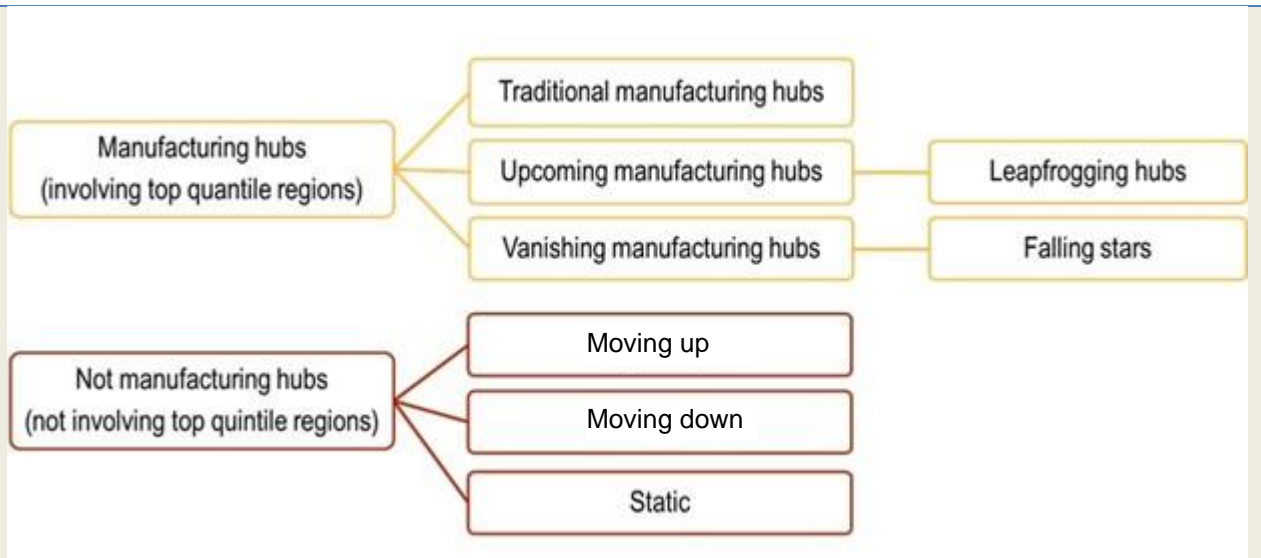
- **With access to (near) a metropolitan TL3 region**, if more than 50% of its population lives within a 60-minute drive from a metropolitan area (an FUA with more than 250 000 people); or if the TL3 region contains more than 80% of the area of an FUA of at least 250 000 inhabitants.
- **With access to (near) a small/medium city TL3 region**, if the TL3 region does not have access to a metropolitan area and 50% of its population has access to a small or medium city (a Functional Urban Area of more than 50 000 and less than 250 000 inhabitants) within a 60-minute drive; or if the TL3 region contains more than 80% of the area of a small or medium city.
- **Remote TL3 region**, if the TL3 region is not classified as NMR-M or NMR-S, i.e., if 50% of its population does not have access to any FUA within a 60-minute drive.

2. Classifying TL3 regions by manufacturing employment change over time

The basis of the classification are shares of manufacturing employees in rural regions in 2000 and 2017 that are divided into quintiles. Following that, the probabilities of regions moving or remaining in any quintile were calculated. Based on these transition probabilities, six categories of regions can be identified (Figure 0.2), three of which are manufacturing hubs from top quintile regions:

- Traditional manufacturing hubs are those regions that used to be in the top quintile back in 2000 and are still so 20 years after, showing a path dependency behaviour.
- Upcoming manufacturing hubs are regions that used to occupy a lower quintile in their respective countries back in 2000 and today are in the top quintile. Among those, there leapfrogging hubs, that is regions that managed to climb to the highest quintile in their country while starting from a very low one.
- Vanishing manufacturing hubs are regions that used to occupy the highest quintile in 2000 and slid down the distribution 20 years after. Among those, there are falling stars, that is regions that fell from the top quintile to a much lower quintile.

Regions that are not in the top quintile, are not considered to be manufacturing hubs. Rather, regions that are moving up are those that moved to a higher quintile, outside of the top quintile. Regions that are moving down are regions that moved to a lower quintile in recent years, but that were not in the top quintile back in 2000. Static regions have not changed quintile between 2000 and 20 years after.



3. Classifying manufacturing activity

The typology of manufacturing firms aims to capture distinctions in how a firm competes: How does it distinguish itself from others, if at all? This taxonomy classifies by whether products are differentiated or commoditised and then considers the underlying drivers of these. Broadly speaking, firms may create products that are either differentiated, meaning they are able to command a price premium for their product, or else are commoditised and open to global price competition. Rural manufacturers may differentiate themselves in three ways: through their artisanal skills and renown, through their heritage and/or through innovation.

They may differentiate themselves in more than one of these at the same time, for example, Italian fabric producers might compete based on both the heritage of the final product and the innovative production capabilities used in producing it. Among those firms selling commodities, some are relatively protected because their business is built around a local natural resource, such as a mine, that cannot be moved. For these firms, transportation costs and/or time constraints (e.g., for fresh food) on moving goods from other jurisdictions provide a barrier to entry that means their local market is relatively safeguarded despite producing commodities. Firms producing commodities that have no local anchor however may be at risk and public policy should try to help these firms develop differentiating attributes as a matter of priority.

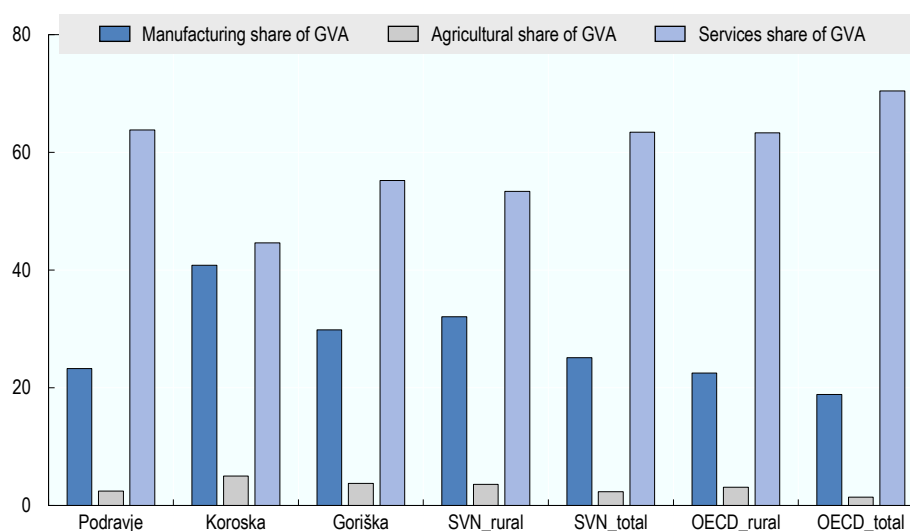
Manufacturer Type	Differentiated			Commoditised	
	Artisanal	Heritage	Innovative	Anchored by natural resources	Anchorless
Characterised by	Highly skilled, small-scale production leveraging a historic process with longstanding ties to the region	Products with a longstanding traditional link to a region, but not a particular production process	High-technology products at the cutting edge of both production technology and product features	Products created from locally sourced natural resources	Lacking differentiating features, competing on price
Examples	Cottage industries, handmade, premium bespoke products	Swiss watches, Scottish Whisky, Italian fabrics	ICT, pharmaceuticals and medical devices	Agri-food, forestry and mining processors	Small household appliances
Tradability	High	High	High	Variable	High
Scalability	Low	Medium	High	Low	High

Source: Authors elaborations and OECD regional typology, classifying small (TL3) regions based on metropolitan population, low density and remoteness" <https://dx.doi.org/10.1787/b902cc00-en>

6. Figure 2.3 illustrates the role of manufacturing in the regions studied. As identified, Koroška as a traditional manufacturing region has manufacturing as a higher share of GVA than the other regions in the study at over 40% in 2021. Rural regions in Slovenia are more manufacturing focused than rural regions across the OECD. The service industry contributes to the regional GVA in Slovenian rural areas 10% less than in rural regions across the OECD (53% and 63% respectively). The gap between the rural and other regions of Slovenia is larger in terms of service sector orientation than across OECD regions, except for the region of Podravje.

Figure 2.3. The case study regions display higher Manufacturing GVA than Slovenian and OECD rural averages

Sectoral GVA percentage shares as a share of total regional GVA, 2021



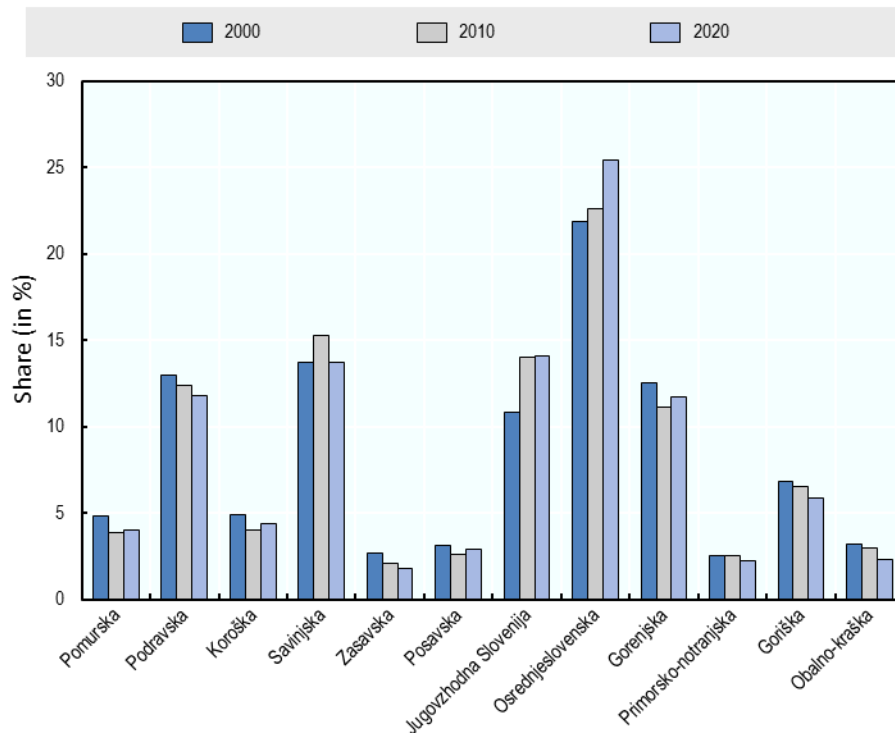
Note: The rural and other regions of Slovenia are defined in table in the annex

Source: Authors' elaboration based on the OECD Regional Database <https://doi.org/10.1787/region-data-en>, (last access: January 2023).

7. Importantly, the overall concentration of manufacturing GVA within a country matter, as it holds implications for the focus of policies within each region and for national industrial policies to understand where their policies are being targeted. When compared to other OECD case study countries, Slovenia falls somewhat in the middle. France has a small handful of rural regions that make up the majority of total manufacturing employment, signifying a certain degree of spatial concentration of production processes. In Germany and Italy, the distribution is almost even across regions. Figure 2.4 shows the contributions of Slovenian regions to the overall manufacturing in the country and indicates how these have changed over time. Over the regions in the case study Podravje contributes around 12% of national manufacturing GVA in 2020 though this value was marginally higher in 2000 at around 13%. Goriška's contribution has also slightly declined from 7.5% to 6% in this time period whereas Koroška's contribution has been the lowest of the three and remains so at around 5%.

Figure 2.4. Slovenia has a low degree of spatial concentration of production in manufacturing

Regional contribution to national manufacturing GVA over time

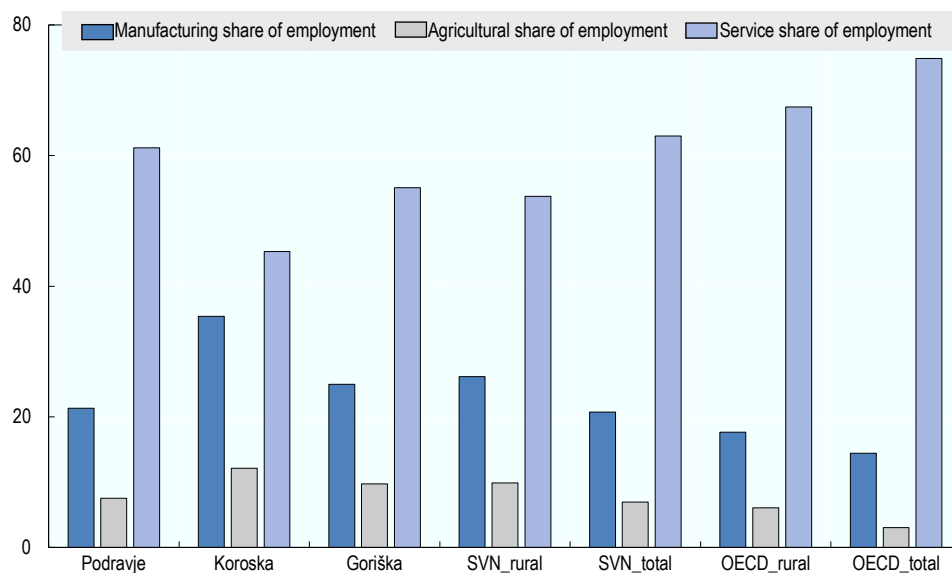


Source: [Statistical Office of Slovenia \(SiStat\)](#): Table "0309254S"

8. This does not mean that manufacturing is not important to the region itself even if not hugely visible at the national level. When considered from an employment perspective rather than a value-added perspective (Figure 2.5) the narrative is somewhat similar. In Koroška 1 in 3 jobs are in the manufacturing sector, in Goriška this is 1 in 4 (about the Slovenian rural area average) and in Podravje this is 1 in 5 (about the Slovenian overall and OECD rural average). Employment in agriculture is much higher across Slovenia and its regions than the OECD average both rurally and in total.

Figure 2.5. On average in Slovenian rural regions over a quarter of jobs are in the manufacturing sector

Sectoral employment percentage shares, 2021

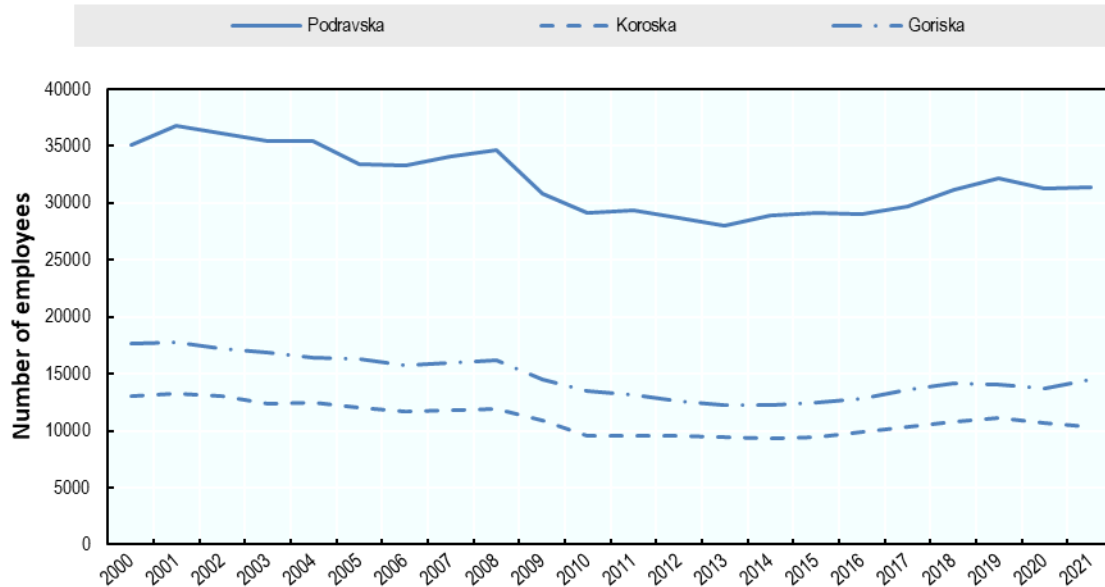


Source: Authors' elaboration based on the OECD Regional Database <https://doi.org/10.1787/region-data-en>, (last access: January 2023)

9. In addition, there is a perception that manufacturing jobs across OECD regions are disappearing at a rapid rate. Figure 2.6 shows that whilst it is true that the direct level of people employed in the manufacturing sector has decreased in all regions across Slovenia, the decrease is rather limited. On average this equates to around 1000 jobs over 20 years. In 2021, Podravje still employed over 32,000 people, Goriška almost 15,000 and Koroška just over 10,000 people.

Figure 2.6. Direct number of employees in the manufacturing sector has only marginally declined over the last two decades

Employment in manufacturing in Slovenia and case study regions over time

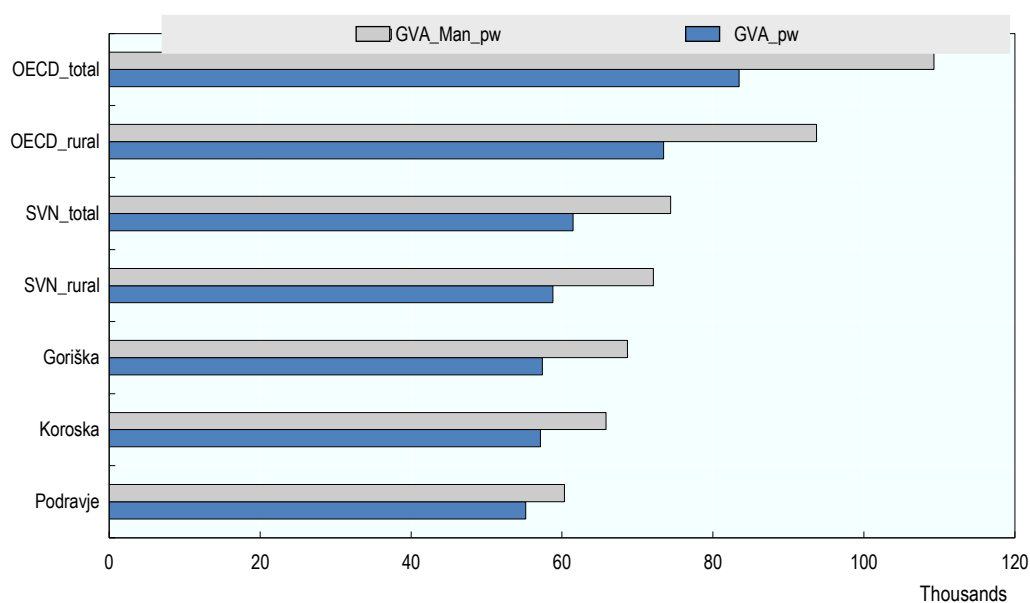


Source: [Statistical Office of Slovenia \(SiStat\)](#): Table "0309258S"

10. Combining the statistics on employment and gross value added provides an indication of labour productivity. This is an important measure of wellbeing in an economy and an indicator of standards of living through the calculation of how much output is produced given the number of workers available. Figure 2.7 shows that, as is the case across OECD countries, across Slovenia manufacturing has a higher output per worker than other sectors. This indicates that its contribution to regional growth can be much more plentiful and meaningful compared to investment in growing other sectors for policy makers i.e., manufacturing is an effective engine for growth. Within Podravje, the manufacturing sector is the least productive among the regions examined and not significantly more productive than the wider economy of the region. This may reflect it not being a strong contributor to the local economy and thus not benefiting from the economies of scale. Both in Slovenia and more widely across the OECD, within the manufacturing sector, rural regions tend to lag on productivity. Despite Goriška having fewer employees in the manufacturing sector than Koroška, it shows a higher output indicating the advancement of the sector in Goriška over the last two decades.

Figure 2.7. Slovenian rural areas are less productive than OECD rural areas on average

Gross value added per worker by sector, €000s 2021

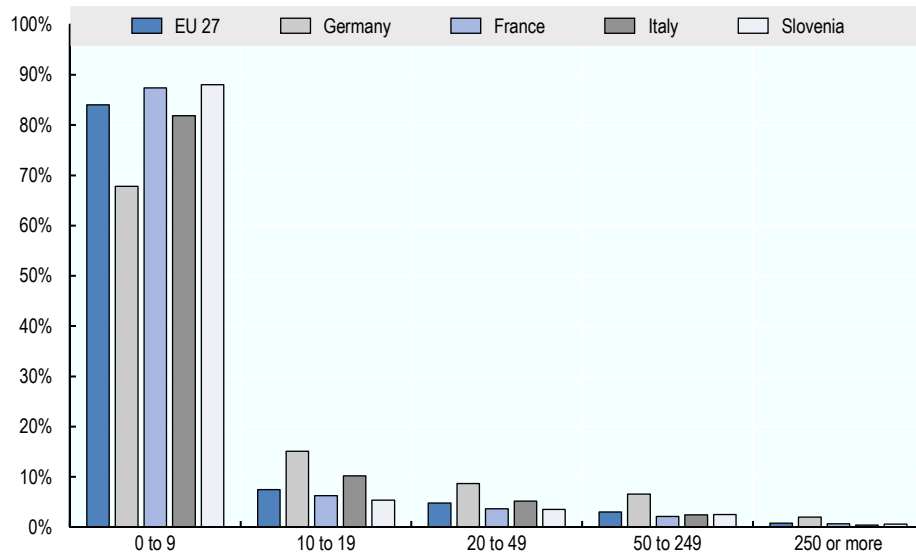


Source: Authors' elaboration based on the OECD Regional Database <https://doi.org/10.1787/region-data-en>, (last access: January 2023)

11. Considering the business population, it is well documented that across OECD countries, SMEs make up around 95% of the business population. (OECD, 2021^[11]). Sectorally, manufacturing firms are on average larger than most firms often due to the investment needed in large scale capital. Figure 2.8 looks at the share of enterprises by size across Slovenia, the EU27 and the other countries in the report for the manufacturing sector. It illustrates that Slovenia has a larger share of SMEs in the manufacturing sector than its counterparts. In addition, in 2020, Slovenia had 121 manufacturing firms with over 250 employees i.e., which constitutes at 0.6% of the business population.

Figure 2.8. Slovenia has more SMEs in manufacturing than other EU countries

Enterprises by size class as a share of total enterprises for selected countries, 2020

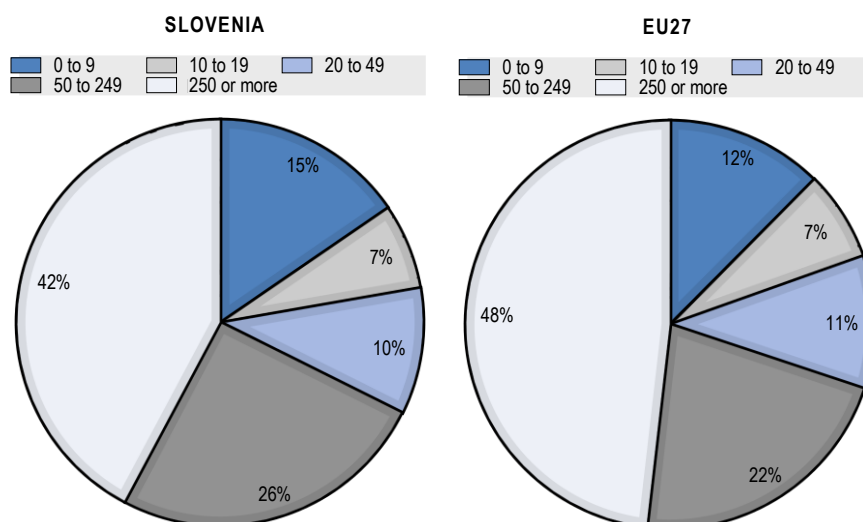


Note: Manufacturing defined through the special aggregates of activities (NACE Rev. 2) as classification C. 2020 was latest year available at time of research though comparisons to earlier years do not show any COVID-19 variations and thus considered suitable for this discussion
 Source: Eurostat Annual enterprise statistics by size class for special aggregates of activities (online data code: SBS_SC_SCA_R2) (last access: March 2023)

12. Nevertheless, these large firms are particularly important in terms of their role in employment. Across the EU almost half of those employed in the manufacturing sector worked in a large firm of 250 employees or more. Whilst this is smaller in Slovenia it still accounts for two-fifths of all manufacturing jobs. The wider literature points to the importance of sustaining larger firms as they tend to be more productive with their ability to be more cost efficient and generate more revenue (OECD, 2021^[2]). They are also more export orientated - in most economies, more than 90% of large industrial firms export, compared to 10%-25% of SMEs (OECD, 2019^[3]) and, in the manufacturing sector, on average more innovative (Damanpour, 1992^[4]).

Figure 2.9. Large firms still contribute significantly to manufacturing employment in Slovenia

Share of persons employed by size class of enterprise in manufacturing, 2020



Note: Manufacturing defined through the special aggregates of activities (NACE Rev. 2) as classification C. 2020 was latest year available at time of research though comparisons to earlier years do not show any COVID-19 variations and thus considered suitable for this discussion

Source: Eurostat Annual enterprise statistics by size class for special aggregates of activities (online data code: SBS_SC_SCA_R2) (last access: March 2023).

13. What is also critical to note are the business dynamics across the regions of Slovenia. Business dynamism, turnover or churn is the rate of firm entry and exit in the economy and is robustly linked to increased industrial productivity. In more dynamic industries, greater competition pushes companies to innovate and improve efficiency while less productive firms are more likely to exit. As a result, resources are reallocated quicker to more productive uses. At a regional level, understanding business dynamism can allow policymakers to tap the potential of this process and enhance local growth. Table 2.1 shows that Podravje can be considered the most dynamic of regions with a churn rate of 3.3% i.e., whilst 6.5% of firms in the regions closed down, almost 1 in 10 firms were created within the last year. Goriška on the other hand is the least dynamic in country with a churn rate of 1.51% i.e., half of Podravje. Koroška has the highest survival rate amongst the regions, reflecting the large traditional nature of manufacturing in the region and it is also one of the least densely populated regions with regards to enterprise distribution.

Table 2.1. Podravje has the most business dynamism amongst Slovenian regions

Enterprise dynamics across TL3 regions in Slovenia, 2020

TL3 (2020)	Birth Rate (%)	Death Rate (%)	Density of Birth Rate (%)	Churn (Births-deaths)	Survival Rate, 5 years (%)	Average Size of Newly Born Enterprise
Pomurska	8.29	6.31	44.32	1.98	48.2	1.75
Podravje	9.77	6.49	71.24	3.28	49.58	1.16
Koroška	8.43	5.59	54.92	2.84	53.96	1.04
Savinjska	9.28	6.54	69.75	2.74	53.04	1.1
Zasavska	9.23	7.12	54.25	2.11	45.4	1.05
Posavska	8.91	7.16	56.85	1.75	50.42	1.17
Jugovzhodna Slovenija	8.82	6.12	55.12	2.7	52.04	1.04
Primorsko-notranjska	8.99	7.16	64.04	1.83	52.84	1.04
Osrednjeslovenska	9.38	6.15	107.89	3.23	51.52	1.05
Gorenjska	9.81	7.23	86.94	2.58	52.31	1.03
Goriška	8.81	7.3	76.84	1.51	50.37	1.03
Obalno-kraška	13.12	10.58	144.86	2.54	43.87	1.03

Note: This data is a derived version of the previous SiStat source. Density is calculated as the number of enterprise births in the region divided by the population (in 10,000) in the region. The survival rate is defined as the share of enterprise survivals in the reference period (t) five years after birth among enterprise births in t-5. 2020 was latest year available at time of research though comparisons to earlier years do not show any COVID-19 variations and thus considered suitable for this discussion.

Source: [Statistical Office of Slovenia \(SiStat\)](#): Table "1418411S" (last access: March 2023)

14. Considering more broadly population trends across the regions can provide a better idea of the landscape in which these businesses operate. Many rural areas across OECD countries face challenges with a slowdown or even decline in population which can pose challenges not just for the retention of skilled labour but also the reduced tax base can make it difficult for the provision of services for the wider community such as pensions and healthcare services (OECD, 2021^[5]). The population growth in the last two decades of rural areas in Slovenia was half that of Slovenia in general. Population growth in general is lower than in other OECD areas. Both Goriška and Podravje saw a decline in population over this time period. At the same time Goriška has the highest elderly dependency ratio meaning there may be to be greater challenges for employment and service provisions in the future. On average Slovenia has a higher share of older populations than OECD countries. Even among rural regions however Slovenia is more densely populated than OECD regions which can provide benefits with regards to connectivity.

Table 2.2. Koroška is more sparsely populated and seeing a greater population decline than other Slovenian rural regions

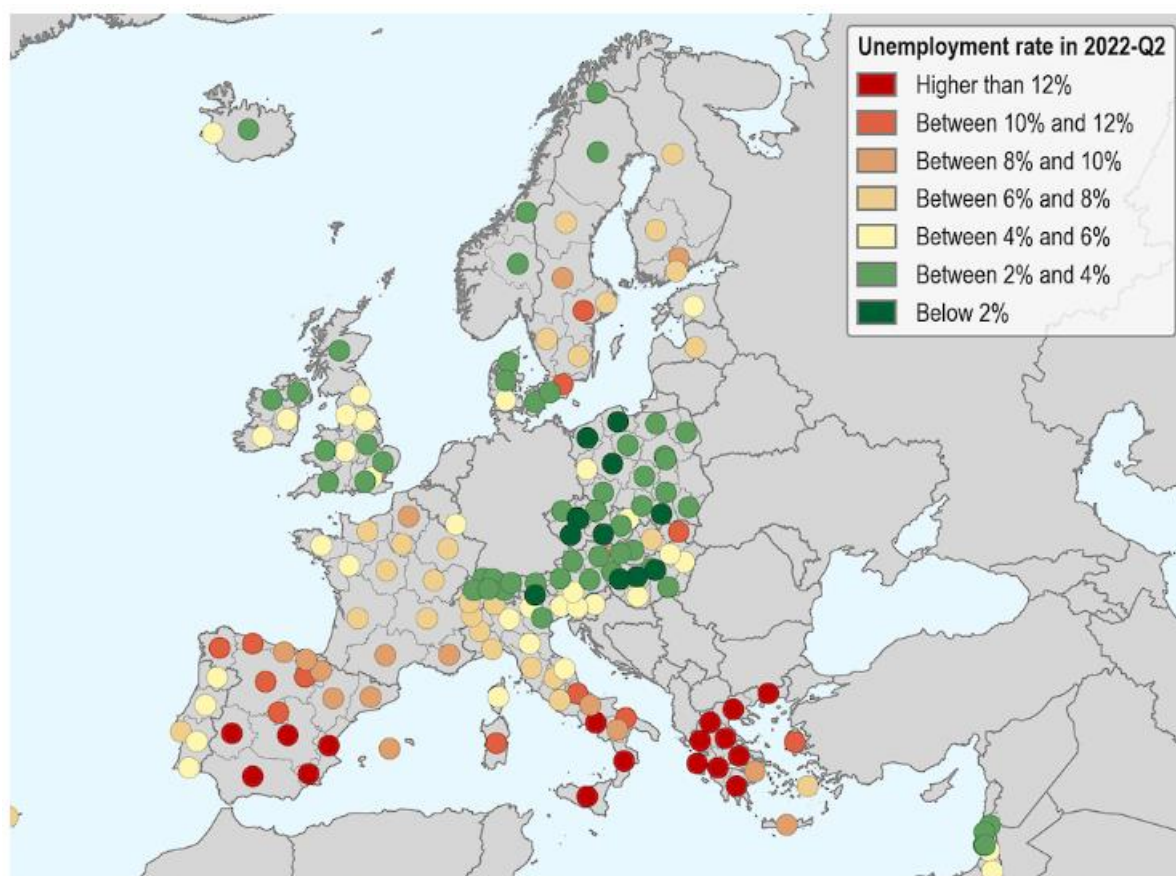
Population statistics

Region	Population (000s,2001)	Population (000s,2021)	Population Growth rate	Population density (2021)	Elderly dependency ratio
Goriška	120	119	-1%	153	39%
Koroška	74	71	-5%	51	35%
Podravje	320	328	3%	68	34%
Rural Slovenia	1,195	1,225	3%	78	35%
Slovenia	1,990	2,109	6%	105	34%
OECD rural	371,194	401,659	8%	14	32%
OECD total	1,195,988	1,354,714	13%	38	30%

Note: The elderly dependency ratio is defined as the ratio of the number of people older than 64 relatives to the number of people in the working age population (15-64 years). Population density is calculated at persons per square KM.
Source: Authors' elaboration based on the OECD Regional Database, (last access: January 2023).

15. Within this we can look at the labour force. Historically, relative to other OECD countries, the strong labour market performance across Slovenia has led to high employment and low unemployment but also widespread labour shortages. Indeed in 2020 the Slovenian employment rate was 71.1% whilst the OECD average was 68.5%. As is consistent with other OECD countries the rural employment rate was lower than the country average at 70.7% in rural Slovenia whilst OECD rural areas averaged 68.0%. On the other hand, the employment gap for disadvantaged groups, such as youth and older workers, is relatively high, reflecting only small improvements in the low employment rate for older workers and a relatively high share of youth not in employment, education or training. (OECD, 2018^[6]) Within the regions in 2020, Goriška had an employment rate of 72%, far above its neighbours whilst Koroška and Podravje was below at 68.6% and 69.9% respectively. Figure 2.10 illustrates these similar trends for unemployment rates across OECD countries in close geographical proximity to Slovenia where all the regions average an unemployment rate close to 4% in 2020.

Figure 2.10. Slovenian unemployment rate is among the lowest amongst neighbouring OECD countries

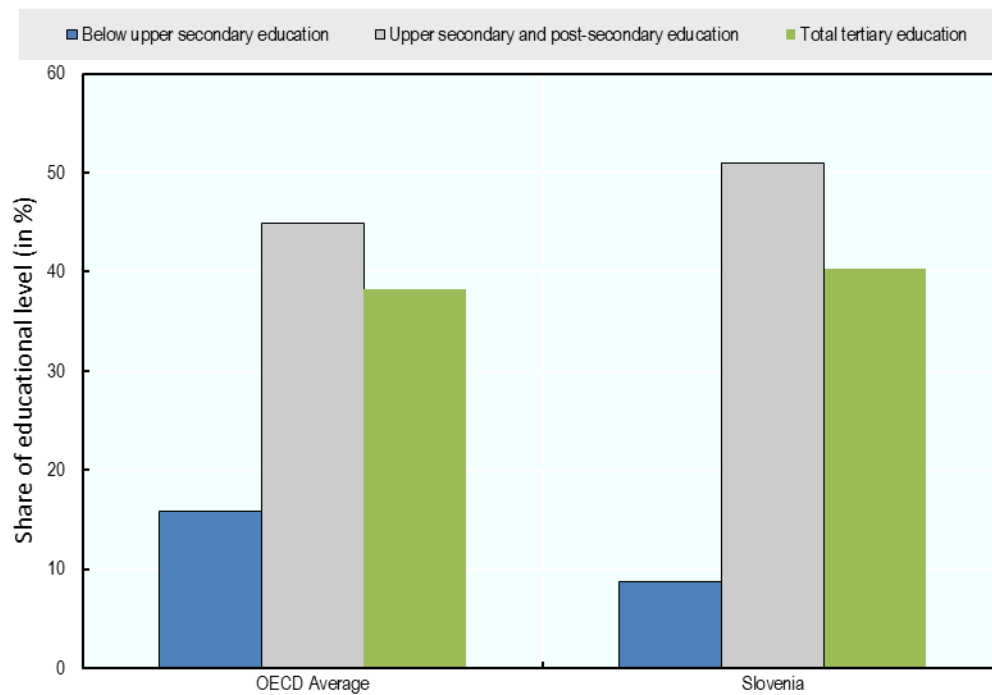


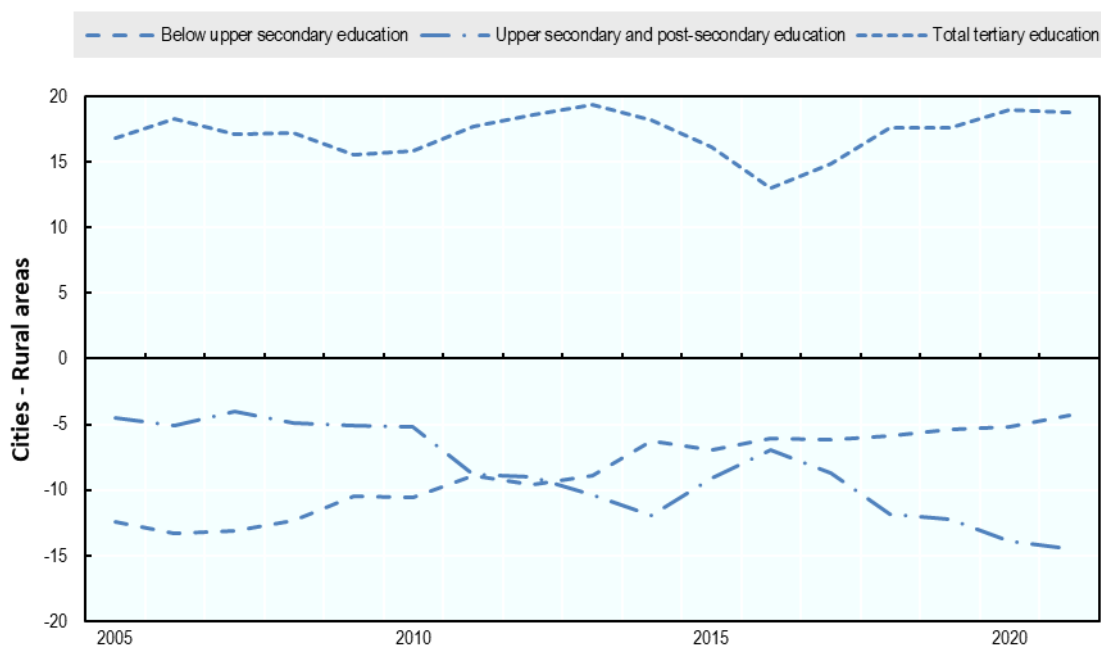
Note: This map is for illustrative purposes and is without prejudice to the status or sovereignty over any territory covered in this map
Source: OECD (2022), OECD Regions and Cities at a Glance 2022, OECD Publishing, Paris, <https://doi.org/10.1787/14108660-en>

16. It is also interesting to see that whilst employment is high so too is educational attainment. This is important for the manufacturing sector as the pace of technological development is rapid and many of the skills required to keep globally competitive require a well-educated workforce. For example, the sector has and will continue to have a strong demand for people with Science Technology Engineering and Mathematics (STEM) skills. Figure 2.11 highlights that urban areas of Slovenia have a higher share of tertiary education than rural areas. However, Slovenia, in general, has a higher share of tertiary education and upper/post-secondary education than the OECD average. Furthermore, the lower figure illustrates the gap between cities and rural regions in terms of educational attainment. Here we see that the difference in tertiary education has remained more or less constant. Interestingly, the situation has reversed for primary and secondary education: With regard to primary education, a converging trend can be seen, whereas secondary education seems to drift further apart.

Figure 2.11. Slovenia has a higher educational attainment rate than the OECD average but still faces an urban-rural divide

Share of educational level, 2021





Source: Eurostat and OECD Regional Database <https://doi.org/10.1787/region-data-en>, (last access: January 2023)

Key takeaways: landscape

- Rural Manufacturing in Slovenia is a critical part of the local economy, employing around a quarter of the rural population in the regions studied.
- Slovenia has a low degree of spatial concentration of production in manufacturing in which the case study regions display higher manufacturing GVA than Slovenian and OECD rural averages.
- Slovenian rural areas are less productive than OECD rural areas on average both in manufacturing and the wider economy which may reflect the fact that there are more SMEs in manufacturing than other EU countries (which tend to on average be less productive than larger firms). Slovenian productivity overall is only marginally higher than that in its rural areas and much thus far from the average overall OECD productivity.
- Slovenia has many long running firms and around 50% of firms survive past the first 5 years. Podravje has the most business dynamism amongst Slovenian regions.
- Slovenia has high levels of employment and educational attainment relative to other OECD countries but still faces an urban-rural divide. Koroška is more sparsely populated and seeing a greater population decline than other Slovenian rural regions and Goriška has an elderly dependency ration almost 10% high that the OECD average.

3 Visions and strategies

17. This section touches on the visions and strategies in Slovenia relevant for the development of rural manufacturing. Slovenia's policies are formed at the national level across a range of ministries. Most relevant is the Ministry of the Economy, Tourism and Sport (METS), Ministry of Cohesion and Regional Development (MCRD), Ministry of Agriculture, Food and Forestry (MAFF) and Ministry of Natural Resources and Spatial Planning. At the subnational level, the country is divided into 58 administrative districts. Administrative units are established to carry out the tasks of the state administration, which must be organised and implemented uniformly in any of the total of 58 administrative units across the country. The areas of administrative units are therefore determined in such a way as to ensure the rational and efficient performance of administrative tasks. As a rule, the area of an administrative unit includes the area of one or more local communities. Slovenia is not organised into regions. However, 12 regional development agencies have been established in all statistically defined regions to promote regional development. Together with municipalities and business entities, they play an important role in creating uniform regional programmes and policy instruments. (OECD, 2022^[7]) Slovenia does not have a direct strategy for rural manufacturing, however there are a range of strategies and initiatives that contribute to this objective.

18. In Slovenia the visions and strategies for the industrial development are generated, developed and managed in coherence with the EU overall development policies, where in recent years the European Green Deal, in response to the global megatrends and Next Generation EU (the European post-pandemic economic recovery programme for the member states, with the implementation time span from 2021 to 2026), set the framework. As a matter of fact, a great deal of the policies in place in Slovenia are attentive to EU ones, adapting to the specific national and subnational features and challenges. The METS alongside other ministries are heavily involved in the smart specialisation process, upgrading the current Slovenian Smart Specialisation Strategy (S4) into Slovenian Sustainable Smart Specialisation Strategy (S5) by the end of 2023 through which Slovenia has set up Strategic Development and Innovation Partnership (SDIP) in priority areas, which serve as a platform for companies to forge new projects and ventures through promoting business to business collaborations that can be financed through different financial instruments. The main role is to raise awareness about this concept, support and equip the companies with necessary knowledge, provide an open space for networking and also support internationalisation and development of joint services (e.g. in the area of training). In addition, on the rural aspect, Slovenia's strategies are aligned with the EU vision for rural development and highlighted these through events they held during the presidency of the Council of the EU in 2021. (MAFF Slovenia, 2021^[8])

19. Slovenia has a new industrial strategy of 2021-2030 defined by the tagline: Green.Creative.Smart. Led by METS, the strategy aims to balance the social, environmental and economical components of sustainable development. The goal is to ensure the competitiveness of the economy and create conditions for restructuring the industry into a knowledge and innovation industry (MEDT Slovenia, 2022^[9]). What is most interesting, and different to other industrial strategies across Europe, is that it has a key tangible and measurable output goal, specifically of increased productivity, measured by value added per employee, to 66 thousand euros from around 44 thousand euros. This direct goal is exceptionally positive to help in the evaluation process of the program – a place where many industrial policies struggle. In this it will be essential that the other areas of state incentives mentioned are considered just as strongly in the evaluation

so as not to achieve the productivity target without the other key social and environmental targets (e.g., through the resource productivity, innovation index and DESI index already considered).

20. The strategy explicitly identifies the importance of manufacturing sector in this transition and targets, specifically the use of wood. Indeed, this is an area that can be better utilised as Figure 3.1 illustrates the currently greater importance of basic metals, computing and machinery as a source of manufacturing jobs in Slovenia. The strategy does not explicitly have a regional dimension though it is mentioned in passing through its broader aim of having a regionally balanced Slovenia and using regional development funds as part of this process. Also, it mentions that rural areas are lacking except in the concept of improving broadband connectivity in these areas – a clearer sense of the regional dimension could elevate this strategy even further.

21. Regional Development Agencies play an important role in regional and rural development as well as the Chamber of Commerce and Industry and the Chamber of Craft and Small Businesses. Each region has a stronger connection with some ministries than others though there are no differences in the framework conditions between the regions (Table 3.1).

Table 3.1. Responsibilities of rural and regional development per region

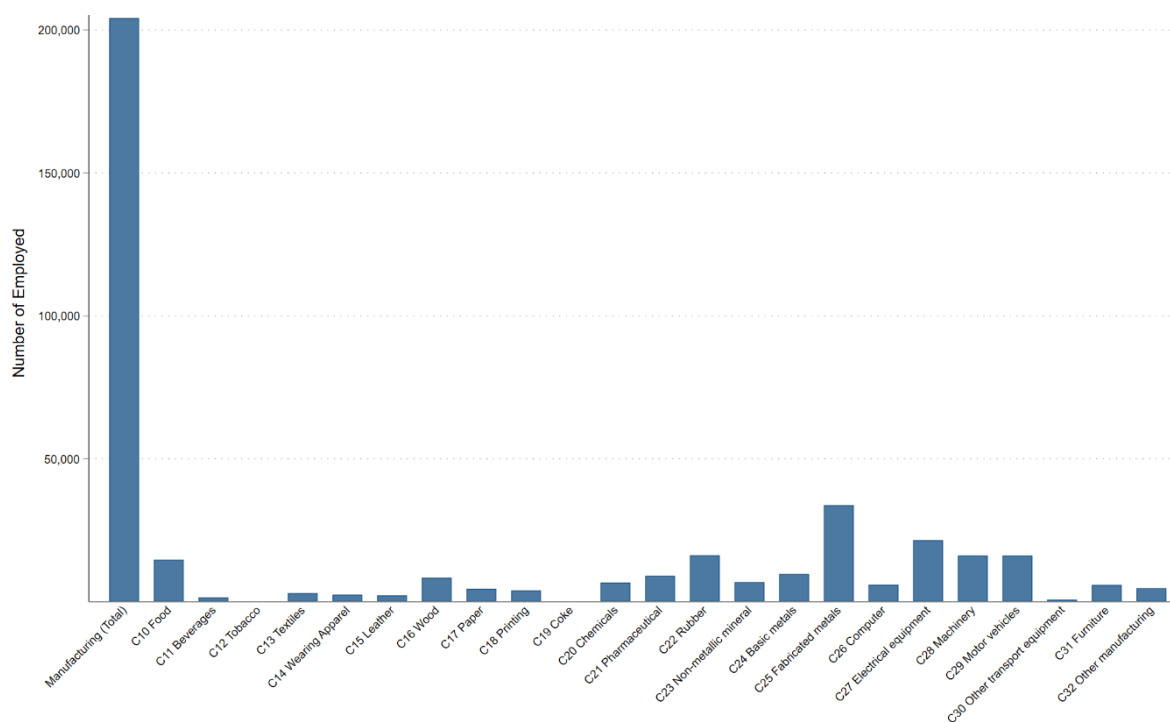
	Goriška	Koroška	Podravje
Regional Development	<ul style="list-style-type: none"> Ministry of Cohesion and Regional Development (MCRD) harmonised regional development) Regional Development Agency of Northern Primorska reporting to MCRD Local municipalities (Act on Municipal Financing, Law on local self-government) 	<ul style="list-style-type: none"> Ministry of Cohesion and Regional Development (MCRD) Regional Development Agency of Koroška reporting to MCRD (Regional Development Programme, support to regional development policy holders) 	<ul style="list-style-type: none"> Ministry of Cohesion and Regional Development (MCRD) (Balanced Regional Development Act) Regional Council reporting to MCRD (41 municipalities of Podravje region) Regional Development Council reporting to (MCRD) (triple helix approach) Regional Development Agency for Podravje – Maribor reporting to MCRD
Industrial Policy	<ul style="list-style-type: none"> Ministry of the Economy, Tourism and Sport (METS) (Law on promoting harmonised regional development) Chamber of Commerce and Industry (representation of regional economy, promotion of regional businesses, information, training and consultancy, networking hub, support to the companies in the region) Chamber of Craft and Small Business (representing members' interests before the government, exercising powers conferred by public law) 	<ul style="list-style-type: none"> Ministry of Economic Development and Technology (METS) Chamber of Commerce and Industry reporting to MEDT (representation of regional economy, promotion of regional businesses, information, training and consultancy, networking hub, support to the companies in the region) Chamber of Craft and Small Business reporting to MEDT (regional chambers in Dravograd, Radlje ob Dravi, Ravne na Koroškem and Slovenj Gradec) (representing members' interests before the government, exercising powers conferred by public law) 	<ul style="list-style-type: none"> Ministry of the Economy, Tourism and Sport (METS) Chamber of Commerce and Industry (representation of regional economy, promotion of regional businesses, information, training and consultancy, networking hub, support to the companies in the region) Chamber of Craft and Small Business (representing members' interests before the government, exercising powers conferred by public law)

Rural Development	<ul style="list-style-type: none"> Ministry of Agriculture, Forestry and Food (MAFF) Ministry of Cohesion and Regional Development (MCRD) (Law on promoting harmonized regional development) Regional Development Agency of Northern Primorska 	<ul style="list-style-type: none"> Ministry of Agriculture, Forestry and Food (MAFF) – through EAFRD exclusively Ministry of Cohesion and Regional Development (MCRD) (Law on promoting harmonized regional development) Chamber of Agriculture and Forestry reporting to MAFF (Celje Agricultural and Forestry Institute with branches in Ravne na Koroškem, Dravograd and Slovenj Gradec) 	<ul style="list-style-type: none"> Ministry of Agriculture, Forestry and Food – through EAFRD exclusively Ministry of Cohesion and Regional Development (MCRD) (Law on promoting harmonised regional development)
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Source: Author's own elaboration

Figure 3.1. Manufacturing of basic metals is an important employer in Slovenia

Number of employees in manufacturing subsectors, 2020



Note: Several manufacturing sectors are missing due to disclosure censoring

Source: [Statistical Office of Slovenia \(SiStat\)](#); Table "1418401S"

22. The Slovenian rural development strategy of 2014-2022, through MAFF, has four priorities; restoring, preserving and enhancing ecosystems related to agriculture and forestry, improving the competitiveness of agri-sector and sustainable forestry, the social inclusion and local development in rural areas (where 435 jobs are expected to be created through support to non-agricultural activities in rural areas) and efficient use of water in irrigation and for reduction of greenhouse gas emissions from agriculture (MAFF_[10]). Evidently, much of the focus is on agricultural activities as is the case for the CAP strategic plan 2023-2027. In the latter there is an increase in the recognition that it is necessary to go beyond a single-sector view of rural areas and develop a holistic approach that, while preserving and

developing the potentials of agriculture. (Erjavec and Rac, 2021^[11]). This can allow farmers in rural areas to consider multiple activities. Making use of the existing and forthcoming high-tech activities within.

23. The rural development in the regions benefit substantially from the LEADER approach, which is the most consolidated bottom-up approach regarding the development of rural areas with direct implications also for rural manufacturing. The Rural Development Programme, i.e., the rural development component of the EU Common Agricultural Policy (CAP) is funded by the EAFRD, the European Agricultural Fund for Rural Development. In fact, since 2014 this fund is integral part of the CAP, where previously it was integrated into the EU Regional Policy. The LEADER, being part of the rural development, was substantially devolved by the regions to the local actors. The flexibility of the programme allows for visions and strategies to be developed and implemented that can go beyond agricultural objectives with great ease and flexibility.

24. The draft spatial development strategy of Slovenia 2050, under the Ministry of Natural Resources and Spatial Planning, builds on the EU territorial 2030 agenda, promotes polycentric development with the vision of achieving territorial cohesion and a better quality of life. It holds 5 key goals:

- Rational and efficient spatial development
- Competitiveness of cities
- Quality of life in urban and rural areas
- Strengthened spatial identity
- Territorial resilience, multifunctionality and adaptation to changes.

25. The draft strategy benefits greatly through its focus on the need to find synergies across policy areas such as transport, energy, rural development and economic sectoral policies. It also benefits greatly through the recognition of the diversity of its rural areas noting specifically the need for cross sectoral action in remote rural areas rather than just a focus on urban-rural connectivity. The spatial development plans for 12 regions are underway creating a clearer link between the spatial policy and industrial strategy, which regions can benefit from substantially. (See Box 3.1.). In addition, responding to the specific comments from the regions themselves can boost the benefit of the plans to all the relevant stakeholders. The regions are looking forward to a response from the national government to improve The Draft of the Spatial Development Strategy of Slovenia 2050.

26. As there are no regions in terms of administrative units in Slovenia, cooperation and general discussions (including on regional funding) with European institutions is carried out at the national level, by the directorate of regional development within MCRD. With regards to strategy, the regional development programmes (RDP) are the key development documents prepared at the regional level but approved and funded at the national level. There are also specific programmes for sub areas such as border areas who receive alternative state aid to create jobs and strengthen management though the broader strategy for these regions is unclear in its links to the RDPs. A successful example of this is the inner areas strategy in Italy that began through pilots in mountainous areas but expanded to other internally rural areas – see Box 3.1. . The regional development programmes vary notably across the regions in this case study:

27. The regional development programme of Podravje is well established and utilised by the regional development agency. Their active goal of inward investment and increased exports have led them to utilise this tool in various international expositions recognising clearly that manufacturing companies lead the way in generating the highest gross value added and among their large companies -accounting for more gross value added than all other companies put together. At the same time the programme notes the large role of the service sector. Considering more closely how the two can be better related (as acknowledged in the national industrial strategy that notes the links between the manufacturing and service sector) is important in boosting both their pitch and potential.

28. Goriška's network of regional development agencies have their programme based on 4 themes; governance, economy, education and regional development plans. It is broadly undergoing changes but aims at a wider geography. Specifically, the North Primorska (Goriška) development region, with an established international regional centre and established internal and cross-border connections, will be a recognisable Central European region that will represent a model of cooperation in the European space. With the knowledge and preservation of a high-quality natural environment, it will provide an attractive and safe environment for both residents and visitors. By strengthening innovation and synergies between stakeholders, it will ensure a sustainable and dynamic economy - also by exploiting global development opportunities, while maintaining its own identity, maintaining the vitality of all areas of the region, ensuring social justice and maintaining a high level of environmental responsibility with future generations in mind.

29. Through the RDP 2021-2027, Koroška wishes to reduce how much they are lagging behind other Slovenian regions and to get closer to the average of EU regions development. With this in mind, in December 2021, the Government of the Republic of Slovenia adopted a new strategy 2021-2030, which relates to Koroška region explicitly with the following 4 goals:

- The focus on circular economy and reuse-reduce-recycle principles,
- Wood as one of the region's main natural resources
- One of the major suppliers of TAB rechargeable batteries stationed in the region
- Connecting higher education institutions in the region with local SMEs

Key takeaways: visions and strategies

- A great deal of the policies in place in Slovenia are attentive to EU ones, adapting to the specific national and subnational features and challenges.
- Slovenia has a new industrial strategy of 2021-2030 defined by the tagline: Green.Creative.Smart. Led by Ministry the Economy, Tourism and Sport (METS), the strategy aims to balance the social, environmental and economical components of sustainable development and explicitly identifies the importance of the manufacturing sector in achieving these ambitions though does not as explicitly have a regional dimension. Furthermore, priority domains of the economy, where Slovenia could excel, have been identified in the Slovenian Smart and Sustainable Specialisation Strategy, S5.
- The Slovenian rural development strategy of 2014-2022, through Ministry of Agriculture, Food and Forestry (MAFF), has four priorities; restoring, preserving and enhancing ecosystems related to agriculture and forestry, improving the competitiveness of agri-sector and sustainable forestry, the social inclusion and local development in rural areas. The level of focus on non-agricultural activity has been increasing over time but could be even further enhanced.
- The draft spatial development strategy of Slovenia 2050, under the Ministry of Natural Resources and Spatial Planning benefits greatly through its focus on the need to find synergies across policy areas and its recognition of the variety of rural areas that exist. The regions are looking forward to a response from the national government to improve The Draft of the Spatial Development Strategy of Slovenia 2050.
- Slovenia is not organised into regions. However, 12 regional development agencies have been established in all statistically defined regions to promote regional development. They develop regional development programmes in line with the national vision through co-ordination with the municipalities.
- The programme Podravje is well established and can be enhanced through considering further the links between the service and manufacturing sector. Goriška's programme has 4 themes covering a broad range of topics which shows ambition but may prove challenging to achieve them all. Koroška's clear goal of reducing their gap with other Slovenian regions provides a good starting point to delve into their 4 goals.

Box 3.1. The National Strategy for Inner Areas, a bottom-up approach harnessing the development and endogenous potential in Italy

The rationale

The Inner Areas National Strategy is a territorial policy aimed at improving the quality of services to citizens and economic opportunities in inner territories that are at risk of marginalisation, are weaker territories affected by depopulation, low economic vitality and distance from the main centres where basic services such as education, health, mobility and digital services are made accessible to the citizens.

Integrative approach to rural development

The Inner Areas Strategy involves six cornerstones:

- It has a national dimension based on strong partnership, horizontal across various ministries as well as vertical between different levels of government.
- It operates through two interrelated factions. The first is focused on improving the quality of life in the selected area through enhanced access to services. The second deals with local development promotion through sustainable and inclusive economic development projects.
- It is a step-by-step process. Among the project areas for 2014-2020 (the first phase of design and implementation of the strategy), one area per region was selected (called “prototype”) to evaluate the strategy’s potential success and trigger a positive learning mechanism. All the selected areas are part of a network, named “project federation”, to encourage networking, exchange, and mutual learning.
- Project areas were selected through a public and transparent process. Dataset, meetings results, and synthesis reports were published online.
- The strategy actions also follow a bottom-up approach in which municipalities and regions are directly responsible for implementation. Co-ordination is ensured through a vertical participatory approach in which local municipal associations are the focal point enabling institutional bodies to work together. The partnerships between municipalities are used to share related management costs.
- Attention to outcome indicators and monitored results. Project areas’ development strategies must focus on expected results and achievable outcomes clearly formulated. Each project area had to identify indicators to monitor and evaluate the results achieved in implementing their own strategy.

One of the principles of the strategy is to foster the coordination between national and local interventions, actions and investments under the unifying concept of the local development plans and the corresponding financial agreement.

Procedure

The procedure leading to the funding of individual projects in the area consists of three main phases:

1. *Selection of the areas*, through a public procedure, jointly carried out by all the national ministries and agencies that are members of the national Technical Committee for Inner Areas and by the region concerned.
2. *Approval of the Area Strategy* by the Department for Cohesion Policies.
3. *Signature of the Framework Programme Agreement*, through which the national Government, the regions and the territories commit for the implementation of the action.

The results and prospects

The mapped areas across Italy, meeting the inner areas' eligibility criteria under 2014-20 programming, cover 60% of the entire national territory, 52% of the municipalities and 22% of the population.

In total, in the 2014-2020 period, 72 areas were selected. They involve 1077 municipalities with approximately 2,072,718 inhabitants. The total budget committed for these areas, through the Framework Programme Agreements, is EUR 1 127 million.

The Italian institutions undertook an analysis on the typology of the projects funded by the inner area strategy, covering 54 of the 72 areas. The results highlight how inner areas strategies focus on competitiveness: about 29% of the total number of interventions are addressed to the competitiveness of businesses absorbing 39% of the resources. In addition, approximately one third of the interventions are directed at context determinants that positively impact on the competitiveness of enterprises; 34% of the total resources are devoted to these interventions.

For the 2021-27 43 new areas have been identified as beneficiaries of the inner area strategy. Two per region and the national budget equals 310 million allocated to the strengthening and expansion of the National Strategy for Inner Areas, working on old and new ones. Out of that, a share of 172 million was earmarked to finance 43 new areas.

Sources: [Agency for Territorial Cohesion](#). [Department for Cohesion Policies](#). [Presidency of the Council of Ministers](#)

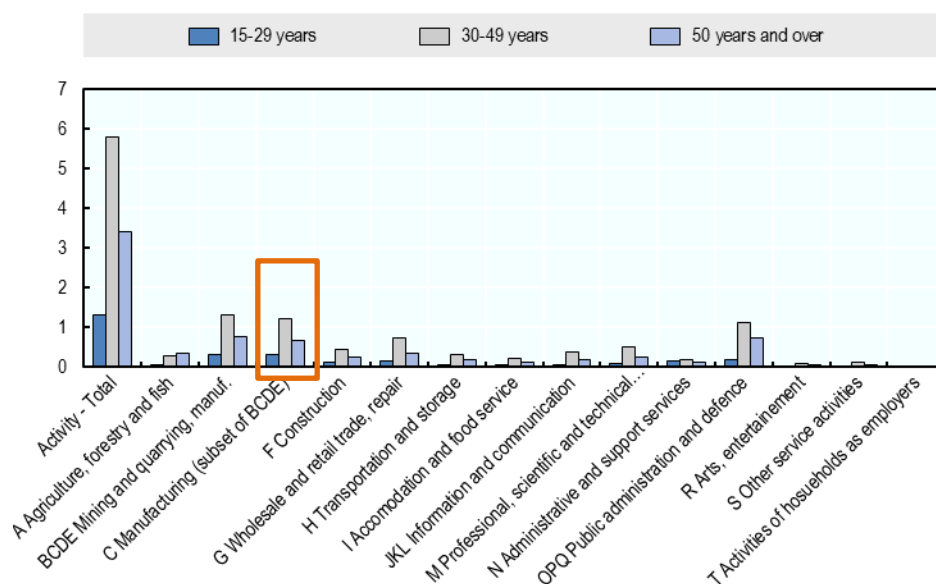
4 Enablers and bottlenecks

Skills

30. One of the main challenges for Slovenian rural manufacturers relates to the recruitment and retention of appropriately skilled labour. Particularly in more remote rural areas, the population is ageing. Indeed, Figure 4.1 below shows that the majority of workers in manufacturing are aged between 30-49 but also that there is still a large share of the youth population. It is essential to be forward looking where, for example, according to population forecasts until 2038 (Nared, 2019^[12]), the Koroška region is the one facing the greatest population loss among all Slovenian regions and Koroška in the next 5 years over a hundred employees will retire.

Figure 4.1. Despite concerns, as well as older workers, manufacturing does have many young workers

Number of employed people by age and sector, 2021



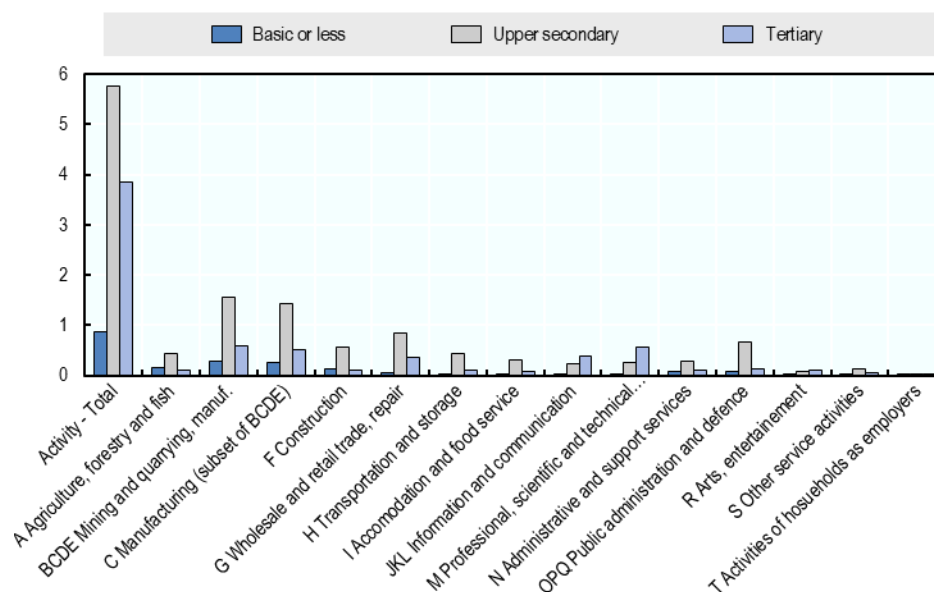
Source: [Statistical Office of Slovenia \(SiStat\)](#); Table "0301985S"

31. At the same time as mentioned, Slovenia does have some of the highest educated youth amongst its peers and women are on average more educated than men. However, Figure 4.2 shows these are not focused in the manufacturing sector. In fact, the majority of the tertiary educated workforce is concentrated in the public administration sector. Technical skills such as apprenticeships fall under the category of upper secondary, however, tertiary does not only include academic, but also higher vocational study schemes

suited best to the manufacturing sector. Policies to encourage labour market participation are the necessary starting point in some cases for the development of the manufacturing sector. For example, of the unemployed in Koroška, 30% are disabled, older and long term unemployed, thus policies focusing on how to re-enter labour market should be matched with the skills needs of the regions.

Figure 4.2. The average manufacturing worker has an upper secondary education, misaligned with the skills needs of the future

Number of people employed by education and sector, 2021

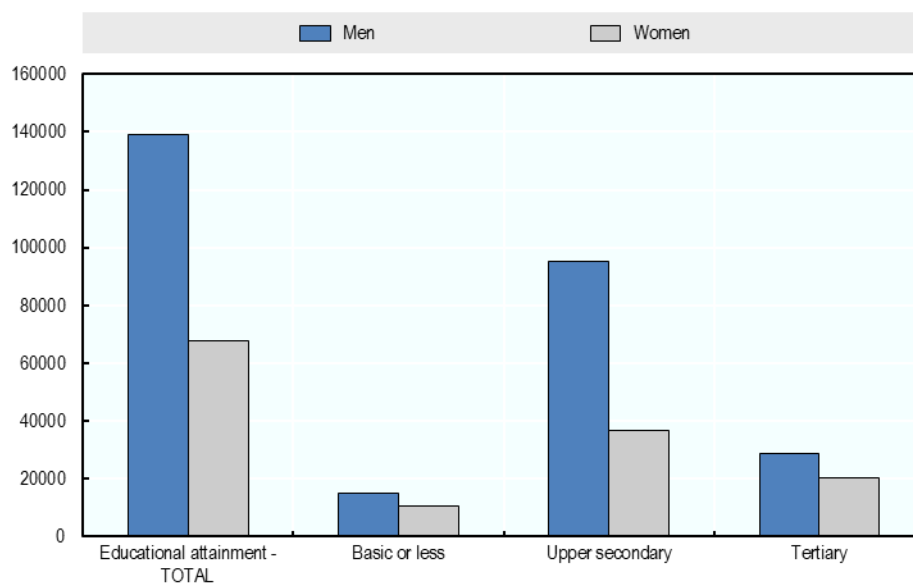


Source: [Statistical Office of Slovenia \(SiStat\)](#); Table "0301985S".

32. This may reflect the gender balance within the sector. Slovenia has the largest tertiary-education gender gap in the EU (women 60.8%; men 37.2%) and a recent Eurostudent survey shows that Slovenia is one of the countries with the fewest female students compared to male students in the field of ICT (Hauschildt et al., 2021^[13]). The rise of STEM education means it may mean when formulating youth attraction policies, particular efforts should be made to encourage females into the manufacturing sector. Figure 4.3 shows that whilst there are many more males than females in the manufacturing sector, within those that are tertiary educated this gender gap in employment is much smaller. One such example can be seen by the Business Development Agency of the Basque Government who launched a white paper on women in manufacturing as part of the wider initiative on the long-term resilience in manufacturing strategy, see Box 4.1. below.

Figure 4.3. The manufacturing sectoral gender gap is smaller for higher educated employees

Number of employees (000s) in the manufacturing sector by gender, 2021

Source: [Statistical Office of Slovenia \(SiStat\)](#); Table "0301985S".

Box 4.1. Encouraging women into manufacturing

The background

Led by the director of technology, innovation and sustainability at the – Business Development Agency of the Basque Government, a whitepaper was developed in October 2021, promoted by the World Manufacturing Foundation, a non-profit organisation with a mission to spread industrial culture worldwide, with the initiative to boost female participation in the sector.

It found three-quarters of the female population don't even consider manufacturing as a potential career. Women do not feel attracted to such a career path because of stereotypes that prevent them from envisaging themselves in such positions. In addition, when choosing a field to study, family is the main influencer for girls, while media is for boys and thus promotion can begin early. Finally, the digitalised and environmentally sustainable manufacturing industry that will lead the economic recovery has to be shown as an attractive place of work that recognises and values the contribution of women.

The initiative

As such, the group formulated 8 concrete recommendations, noting the relevant stakeholders at each stage of the career; first to enter the sector (access), secondly to successfully retain female employees (thrive) and finally to become leaders in the sector. Each action is noted to require building blocks including collection and monitoring of relevant data, cultural changes in the promotion of the attractiveness of the sector and increasing the number of female role models.

ACCESS	POLICYMAKERS: international organisations, national and local governments...	EDUCATIONAL CENTRES: schools, universities, research centres, think tanks...	INDUSTRY AND INDUSTRY-RELATED ASSOCIATIONS
1. ENGAGE GIRLS IN STEM	<ul style="list-style-type: none"> Support, guide and advocate for action on STEM gender equality. Update educational curriculum that encourages scientific and technological vocation among girls and young women. Provide tools, information, contacts to educational centres and families. 	<ul style="list-style-type: none"> Create alliances with industrial stakeholders in order to attract women. Provide mentorship and internship programmes. 	<ul style="list-style-type: none"> Provide mentorship programmes, role models and showcase the attractiveness of a new manufacturing model.
2. INCREASE WOMEN EMPLOYABILITY	<ul style="list-style-type: none"> Suitable measures and actions to increase the share of female workers in manufacturing: benefits, a less risky and more flexible work environment, easy access to these jobs. Economic responses and recovery plans with gender lens. Dedicated tools: tax support, funding programmes, infrastructure, networking. 	<ul style="list-style-type: none"> Develop gender-specific career paths that support women's childbearing and childcare scenarios. Concrete analysis and data provision: advantages or challenges of women's participation in the manufacturing industry. Support early-stage women entrepreneurs (increase their performance and growth potential through entrepreneurial education and training). 	<ul style="list-style-type: none"> Promote gender equality in recruiting and selection processes. Build an outreach campaign to attract women into the manufacturing industry with university career centres. Guidance and training to women entrepreneurs (especially from associations). Develop government and private sector funded incubators to mentor and financially support the female funded startups.
3. PROMOTE FEMALE ENTREPRENEURSHIP			
THRIVE	POLICYMAKERS: international organisations, national and local governments...	EDUCATIONAL CENTRES: schools, universities, research centres, think tanks...	INDUSTRY AND INDUSTRY-RELATED ASSOCIATIONS
4. EQUITABLE WORK ENVIRONMENT	<ul style="list-style-type: none"> Public childcare strategies, paternity and maternity leave. Shared care responsibility within the family, leaving behind the traditional division of tasks. In alliance with the private sector develop a binding legal framework that can promote work-life balance for both women and men. 	<ul style="list-style-type: none"> Data and research: gender bias in the manufacturing industry. Build a benchmarking model on equity and inclusion best practices for the manufacturing industry. Develop training for male employees focused on unconscious bias and emotional intelligence. 	<ul style="list-style-type: none"> Provide supportive environments where women feel safe, valued and respected. Leaders to assess current work culture and adjust it to promote a fair and equitable work environment. Shift from a "presence-driven" culture to a "results-driven" culture. Offer family-friendly tools and solutions for both men and women.
5. EQUAL PAY FOR EQUAL VALUE	<ul style="list-style-type: none"> Mandate that companies publish gender pay bands for work categories. Establish goals for gender representation and payment at all levels and track their progress. 	<ul style="list-style-type: none"> Data and Research. Gender pay gap report. 	<ul style="list-style-type: none"> Analysis of gender gaps in pay and career advancement and implementation of actions. Promote company HR executives to analyse internal pay differences and make adjusted plans to achieve comparable amounts for men and women. Have associations sponsor a pay survey that focuses on gender differences.
6. GENDER EQUALITY PLANS	<ul style="list-style-type: none"> Financial support for companies that have specific programmes that support the presence, advancement and promotion of female workers. Promote, develop and implement 	<ul style="list-style-type: none"> Integrate gender equality into academia and research. Develop a toolkit for mainstreaming and implementing gender equality plans within the manufacturing industry. 	<ul style="list-style-type: none"> Commitment from leaders to develop and promote gender-inclusive policies and practices. Create company mentorship programmes that align female workers with high performers.
LEAD	POLICYMAKERS: international organisations, national and local governments...	EDUCATIONAL CENTRES: schools, universities, research centres, think tanks...	INDUSTRY AND INDUSTRY-RELATED ASSOCIATIONS
7. WOMEN PARTICIPATION IN DECISION MAKING	<ul style="list-style-type: none"> Set a standard of minimum level of participation of women in every decision-making process. Provide financial incentives to companies that demonstrate a minimum level of participation of women in different decision-making processes. 	<ul style="list-style-type: none"> Provide women with the training needed to support their growth on fundamental leadership skills, hard skills, soft skills, digital skills in alliance with industry and related associations. 	<ul style="list-style-type: none"> Ensure equal consultation with women and add weight to women's priorities in decision making. Create a campaign with key associations that has the goal of placing women in senior positions and on boards, and have member organisations be held accountable for moving the needle forward.
8. WOMEN ON BOARDS	<ul style="list-style-type: none"> Develop legislation on company board representation. 	<ul style="list-style-type: none"> Develop and implement training opportunities: leadership training in alliance with industry and related associations. 	<ul style="list-style-type: none"> Allow and increase gender diversity in boardrooms and take into account women's role as corporate social change agents.

Source: Women in manufacturing, <https://worldmanufacturing.org/women-in-manufacturing/>, (last access: March 2023)

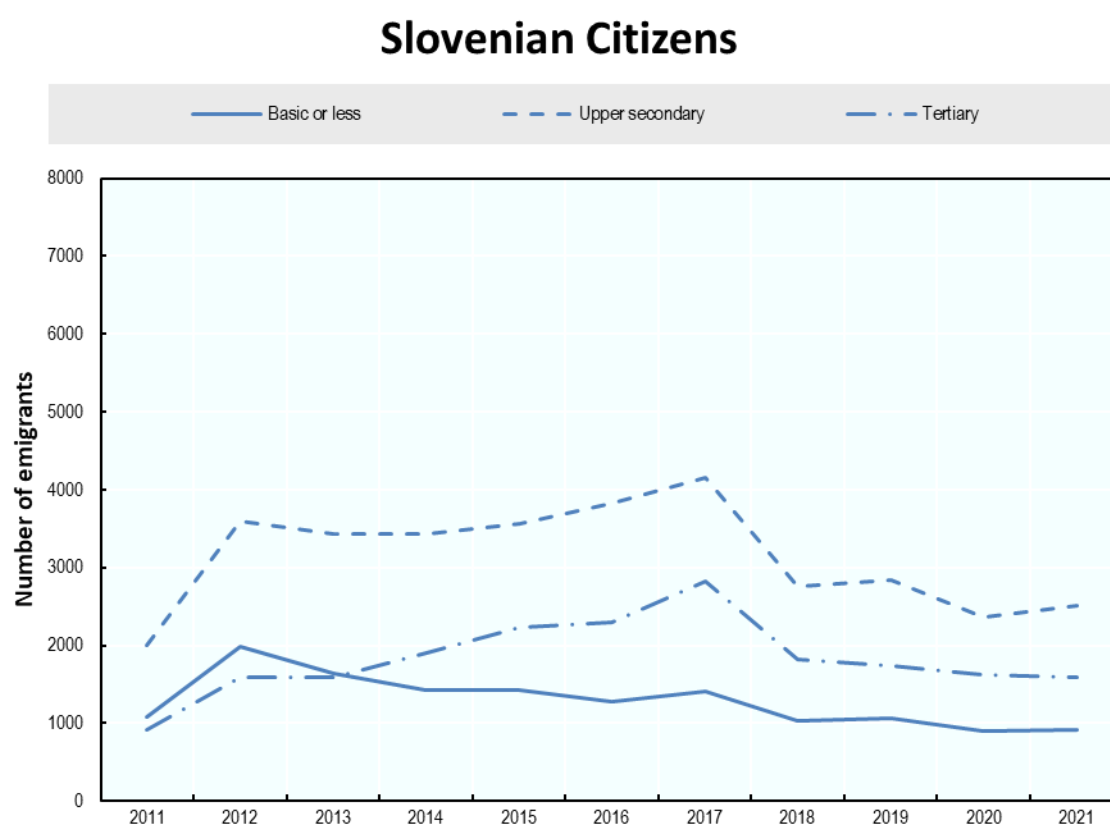
33. There is also the challenge that even if the local population hold the relevant skills, regions find that these workers are not attracted to what is offered locally and tend to move abroad. Figure 4.4 indicates that over the recent years across Slovenia more broadly it is the migrant population that has been leaving. These figures may reflect the impact of COVID-19. Interestingly this rate is lower for tertiary educated people and similarly the number of tertiary educated Slovenian's emigrating has marginally decreased over the last few years. This data is not disaggregated by regions but still reflects the roles for regional

governments to find means of retaining their native workforce which may be simpler than expected and attracting foreign talent, which maybe more complex than anticipated.

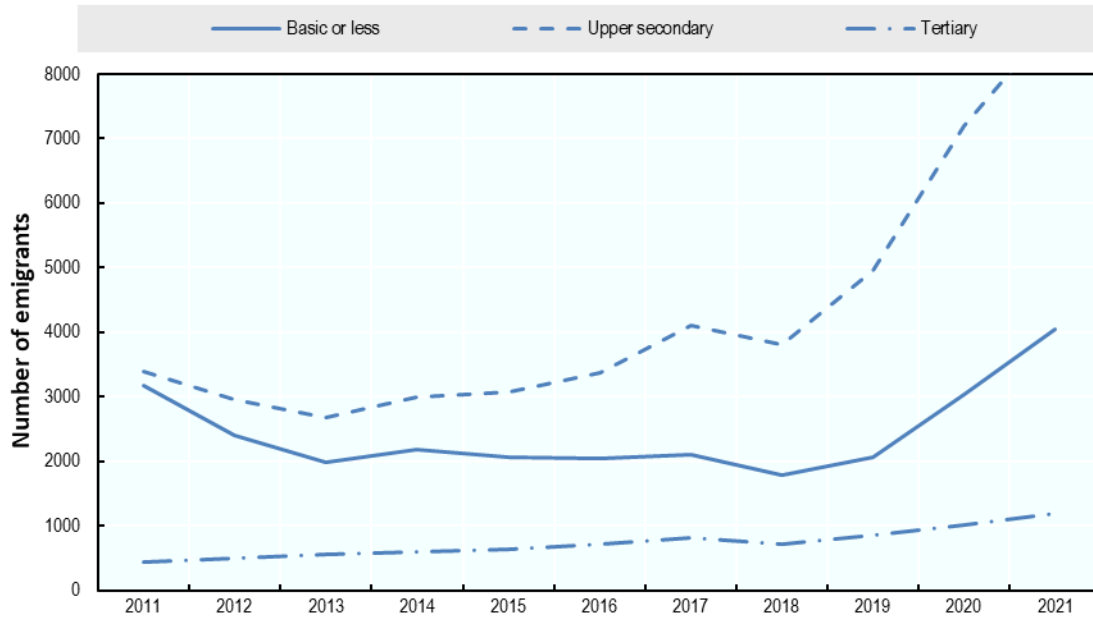
34. Figure 4.5 considers net migration of just Slovenian citizens to destination country. Migration to Austria and Bosnia and Herzegovina are relatively high for primary and upper secondary educated Slovenians whereas Italy, Germany and Switzerland tend to attract more tertiary educated Slovenians. These are all bordering or culturally bordering regions and thus also do not include cross-border commuting workers. It was noted during the case study visits this distribution was a reflection of the differing wages between the regions. In addition, as this is not directly the case for Croatia this reasoning may be interesting to explore and thus form a source of knowledge for regional attraction policies.

Figure 4.4. Emigration from foreign citizens has been increasing over the last few years, less so from Slovenian citizens

Total number of emigrants by education level over time



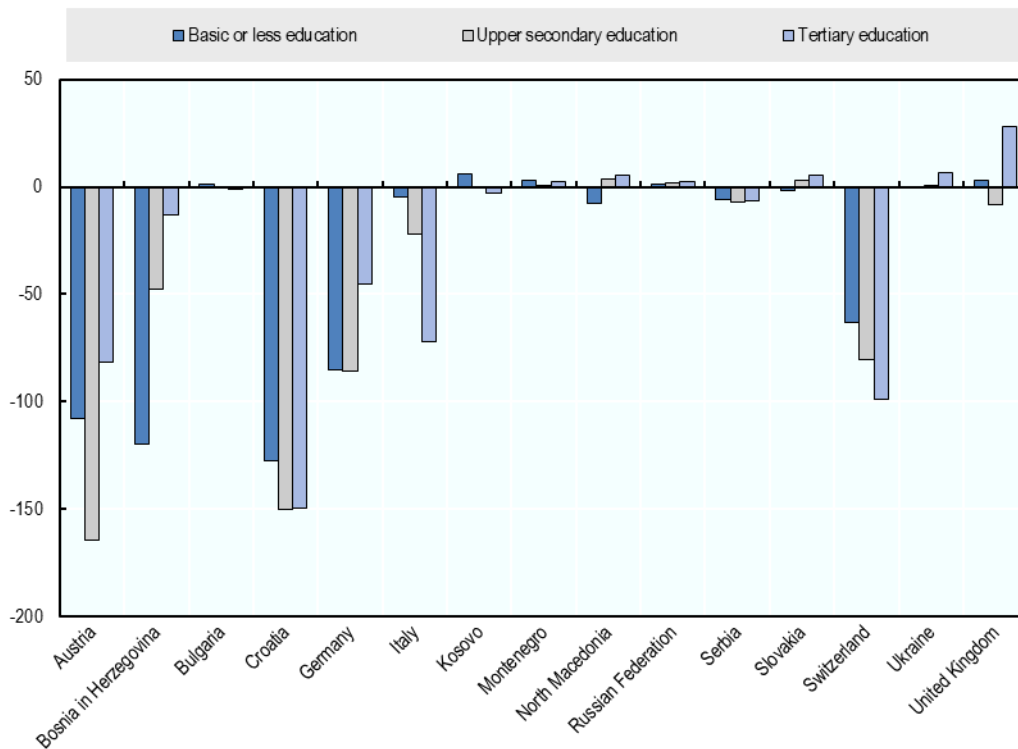
Foreign Citizens



Source: [Statistical Office of Slovenia \(SiStat\)](#): Table "05N3214S"

Figure 4.5. Slovenians migrating to Italy and Switzerland are more likely to be tertiary educated

Net weighted* migration of Slovenians by education level, 2021



Note: The data are weighted to take into account the general education distribution of Slovenians to account for the fact that a lot more people in Slovenia have secondary education than tertiary or primary education. As such Weighted Variable Tertiary Migrants = Net Tertiary Migration / (Total Tertiary Population) * (Total Population/3)

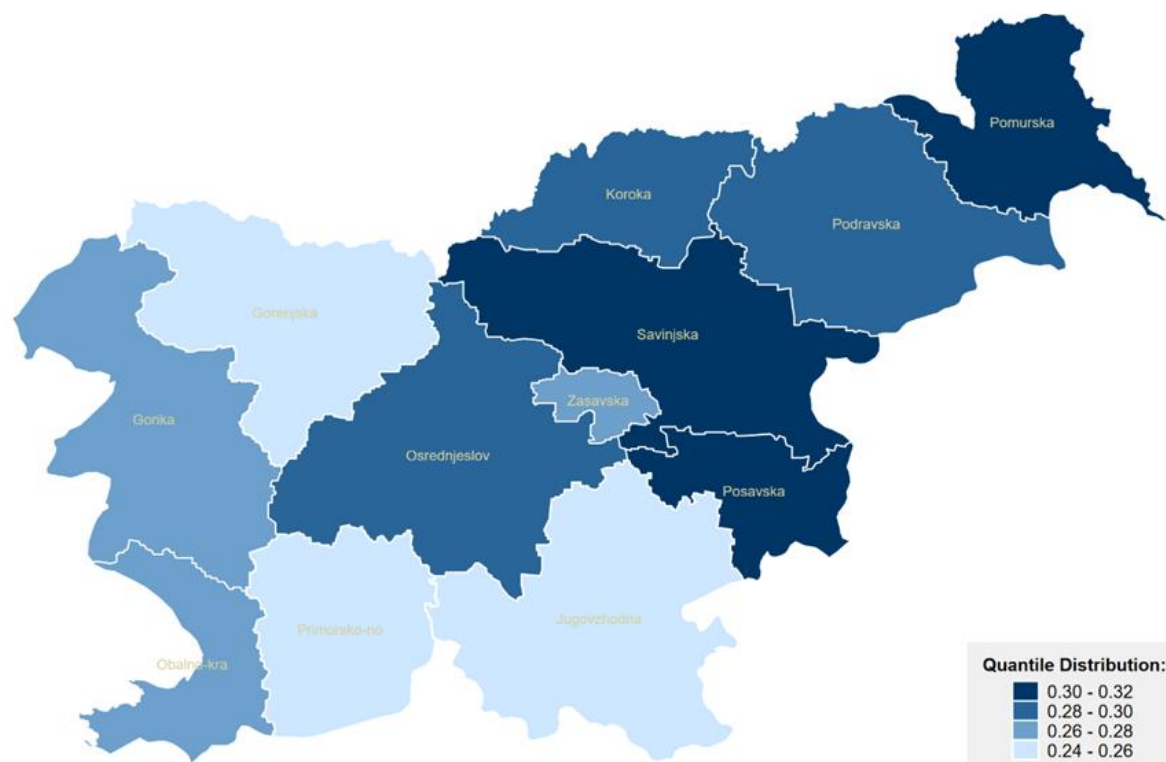
Source: [Statistical Office of Slovenia \(SiStat\)](#): Table "05N3214S"

35. In addition, Slovenia has one of the lowest gross worker reallocations amongst OECD countries¹ at less than 15%, this means that people do not move from their job very much. In comparison in countries such as Turkey, Iceland, Denmark, Spain, Canada or the United States, 25% or more employees were hired on average in each year, and a comparable percentage separated from their employer in the same period (OECD, 2010_[14]).

36. At the same time the average commuting distance ranges from 15-30km in which Goriška shows the least number of commuting trips undertaken of the case study regions (Figure 4.6). Koroška regional actors also note many of its youth lacks motivation and mobility is a problem. Encouraging movement from within Slovenia may be a successful strategy to pursue particularly following the changes in pay over the years. Specifically, Figure 4.7 shows gaps between regional gross monthly earnings has been decreasing over time and as such this may likely not be a factor in the future as the regions develop. This is of course dependant on the physical infrastructure being suitable to do so (discussed further in the business environment section below).

Figure 4.6. Commuting and job reallocation within Slovenia could be encouraged further in the case study regions

Number of commuting trips made for the purpose of work by region, 2021



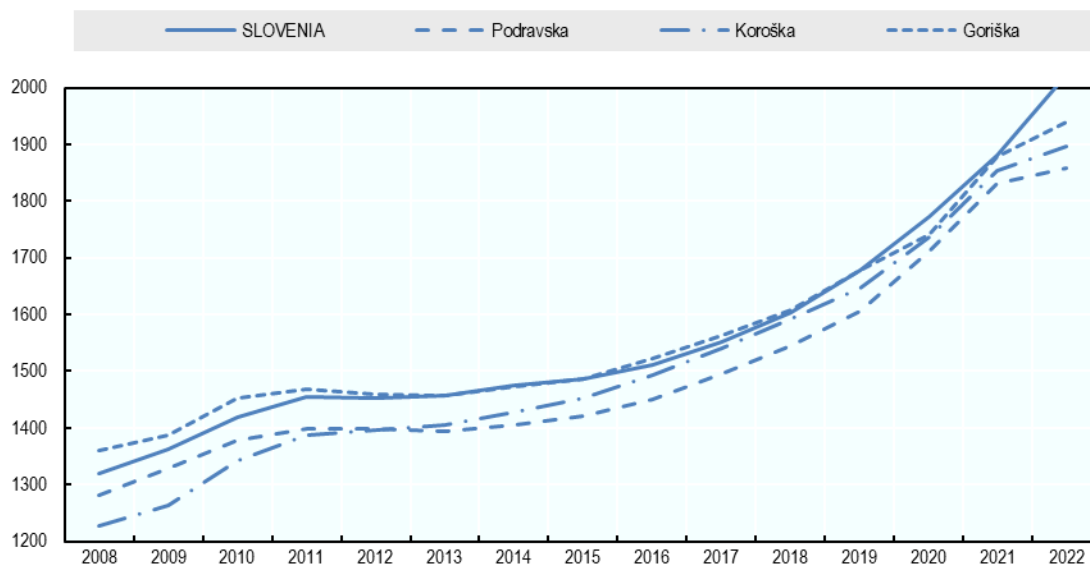
¹ Osrednjeslovenska has been the only statistical region with more workplaces than persons in employment living in it. Ljubljana is the most burdened by labour migration. Daily or otherwise commute to work to Ljubljana almost 141,300 persons from other municipalities.

Note: A trip-maker is a respondent (aged 15–84) who reported at least one trip on the observation day. Only trips longer than 100 m and up to 300 km were taken into account. The trip could start or end over the country border.

Source: Slovenia statistical office, <https://www.stat.si/statweb/File/DocSysFile/10067> (last access: March 2023).

Figure 4.7. The earning gap between regions has been shrinking

Average monthly gross earnings per person (EUR) by region, 2008-2021



Source: Slovenia statistical office, <https://www.stat.si/statweb/File/DocSysFile/10067> (last access: March 2023)

37. Regions should continue to focus on attracting and retaining workers through non-financial means. Goriška stands out amongst the study regions due to its successful pursuit of a range of methods of attraction. These include a scholarship scheme, communicating to employees the social responsiveness of the businesses through the creation and highlighting of socially responsible certificates and public-private partnerships through the investment with the Kolektor group in a wide range of areas including consulting, daily newspaper, health and social care, tourism and catering services. In the short term, to tackle the issues relating to labour poaching, the region of Koroška highlighted individual firm initiatives to boost attractiveness such as social areas, gym facilities, reduced price healthy meals and increased opportunities for participation in wider company matters for all grades. For such initiatives to succeed it is critical to engage all relevant stakeholders for example to tackle the issues relating to farm and non-farm residents countering noise pollution and trespassing concerns. In addition, whilst there may not be bars and restaurants often considered essential to attract youth, outdoor pursuit activities and the connectivity to nature are plenty – there is great enthusiasm from manufacturing firms in the region to connect with the tourism sector.

38. Another key critical bottleneck derives not from the supply of labour but from the demand. Whilst many firms from the regional chambers of commerce spoke to their use of automation to replace their limited labour supply (for example Koroška noted a loss of 400 jobs to automation over the last years), they noted not all jobs could be automated. However, discussions with youth within each of the regions, particularly in Podravje, identified that the skills firms require have not adapted to the high levels of youth educational attainment. In other words, the identification of augmentation of jobs rather than fully automating. Augmentation refers to the automation potential of a part of a job rather than the whole job itself. Work from (Mckinsey, 2021^[15]) identifies that within the manufacturing sector high skilled workers usually in the managerial, expert and interface roles, go hand in hand with the automation of predictable

physical and data tasks. In addition, understanding the large share of service-related occupations in manufacturing jobs can also help promote the benefit of technical jobs compared to other occupations such as doctors. Whilst this may have changed over time, data from 2013 show that in Slovenia this was at 38%, below the EU average of 41% (OECD, 2013_[16]).

Thus, linking local universities more explicitly to skills of the future of the sector can bring the regions up to date and develop forward looking education systems as noted in the Podravje region when highlighting the benefit to the links to the technical centre in Maribor. Use of foresight tools can facilitate the identification of future jobs based on the values of the region. One such example can be found in Scotland where the future green jobs were identified. Following such steps, employer led initiatives to ensure the relevant training of staff can help with the process as can be seen in Ireland.

Key takeaways: skills

- One of the main challenges for Slovenian rural manufacturers relates to the recruitment and retention of appropriately skilled labour. Whilst the general population of youth is tertiary educated, the average manufacturing worker holds an upper secondary education.
- However, the skills of the future in the manufacturing sector globally align more closely to the educational attainment. i.e. critical bottleneck derives not from the supply of labour but from the demand. Policies to attract and retain the workforce should encourage businesses to upgrade their processes to utilise these skilled workers; linking local universities more explicitly to skills of the future of the sector can bring the regions up to date and develop forward looking education systems.
- More should be done to attract women into manufacturing. Understanding the large share of service-related occupations in manufacturing jobs can help to promote these jobs compared to other occupations (such as doctors as noted in Podravje especially).
- Non-financial incentives can help retain high skilled workers in Slovenia and not travel over the border for the higher salaries. This includes fair working conditions and extra facilities such as lunches, gyms, creches etc. as seen by various successful firms across the case study regions highlighted during the study visit, particularly in Goriška.
- Given its size, more should be done to encourage travelling for work within Slovenia, as it has one of the lowest gross worker relocations amongst OECD countries at less than 15%, particularly as the earning gaps between regions has been shrinking.
- in Koroška, the manufacturing sector can aid with the issue of long term unemployment through focusing policies on how to re-enter the labour market to match future skills needs rather than simply fill current low-intensity roles shortages.

Box 4.2. Matching current skills demand to skills for the future

Green Skills in Scotland

The Climate Emergency Skills Action Plan (CESAP) sets out a clear direction for the changes needed in the skills system and signals the role that industry, communities and individuals across Scotland will play in achieving this. The CESAP was published in December 2020 and focuses on the key actions needed over the next five years to 2025, with an update of the plan by the end of 2023.

CESAP provides a new evidence base on the skills needs of a net-zero economy with consideration of demographics, population and the availability of people, specific skillsets and geographies. It identifies potential opportunities for job growth across five broad areas of economic activity and notes priority areas for activity to drive economic change. The CESAP has been developed through engagement with industry leadership groups and an expert group comprising Skills Development Scotland, the Scottish Funding Council, Zero Waste Scotland, the Scottish Cities Alliance, NatureScot, the Scottish Government's Domestic Climate Change and Skills Divisions, Highlands and Islands Enterprise, Scottish Enterprise, South of Scotland Enterprise, the Universities of Edinburgh and of Strathclyde.

Three categories of green jobs have been identified, providing a framework against which to gauge likely skills demand and develop and focus interventions when the CESAP moves to its implementation phase. These are:

- New and emerging jobs that relate directly to the transition to a net-zero economy, e.g., hydrogen cell technicians, carbon monitoring technicians and urban miners.
- Jobs affected by the transition to a net-zero economy that will need enhanced skills or competencies, e.g., architects and environmental consultants.
- Existing jobs that will be needed in greater numbers as the result of the transition to a net-zero economy, e.g., insulation installers, energy assessors and designers and multiskilled onsite operatives.

Two important measures defined in the plan are the establishment of a Green Jobs Skills Hub that will cascade intelligence into the skills system on the numbers and types of green jobs that will be needed over the next 25 years and a Green Jobs Workforce Academy. The academy will support existing employees and those who are facing redundancy, to assess their existing skills and undertake the necessary upskilling and reskilling they need to secure green job opportunities as they emerge. Various other activities and in-depth descriptions can be found here.

Promoting enterprise led learning in Ireland

Skillnet is a national agency dedicated to the promotion and facilitation of workforce learning in Ireland. Skillnet supports over 16 500 companies nationwide, 56% of which are micro-enterprises, 26% are small enterprises and 13% are medium enterprises and 5% are large companies through a wide range of valuable learning experiences to over 50 000 trainees.

Specifically, Skillnet encourages firms to lead the process for training to ensure that programmes delivered are highly relevant to industry needs and are adapted to the future needs of the local area. Training is open to management and employees of companies who become members of a Skillnet Network and has found their training and up-skilling significantly enhances the career mobility of the workforce. Skillnet allocates funding to Learning Networks, which are groups of companies within the same industry sector (Single Sector Networks) or region (Multi Sector Networks) with similar training needs, so they can receive subsidised training.

With 70 distinct Networks nationwide, businesses can find a Network that has experience in a particular area of interest and understands specific business needs. Networks offer a flexible approach to suit specific business needs: they work with businesses to source and part-fund training partners to provide relevant up-skilling.

Source: OECD (2019), SME and Entrepreneurship Policy in Ireland, OECD Studies on SMEs and Entrepreneurship, OECD Publishing, Paris, <https://doi.org/10.1787/e726f46d-en>; Skillnet Ireland (About Us - Workplace Learning | Skillnet Ireland), About Us - Workplace Learning | Skillnet Ireland, <https://www.skillnetireland.ie/about/> (accessed on 17 January 2023).

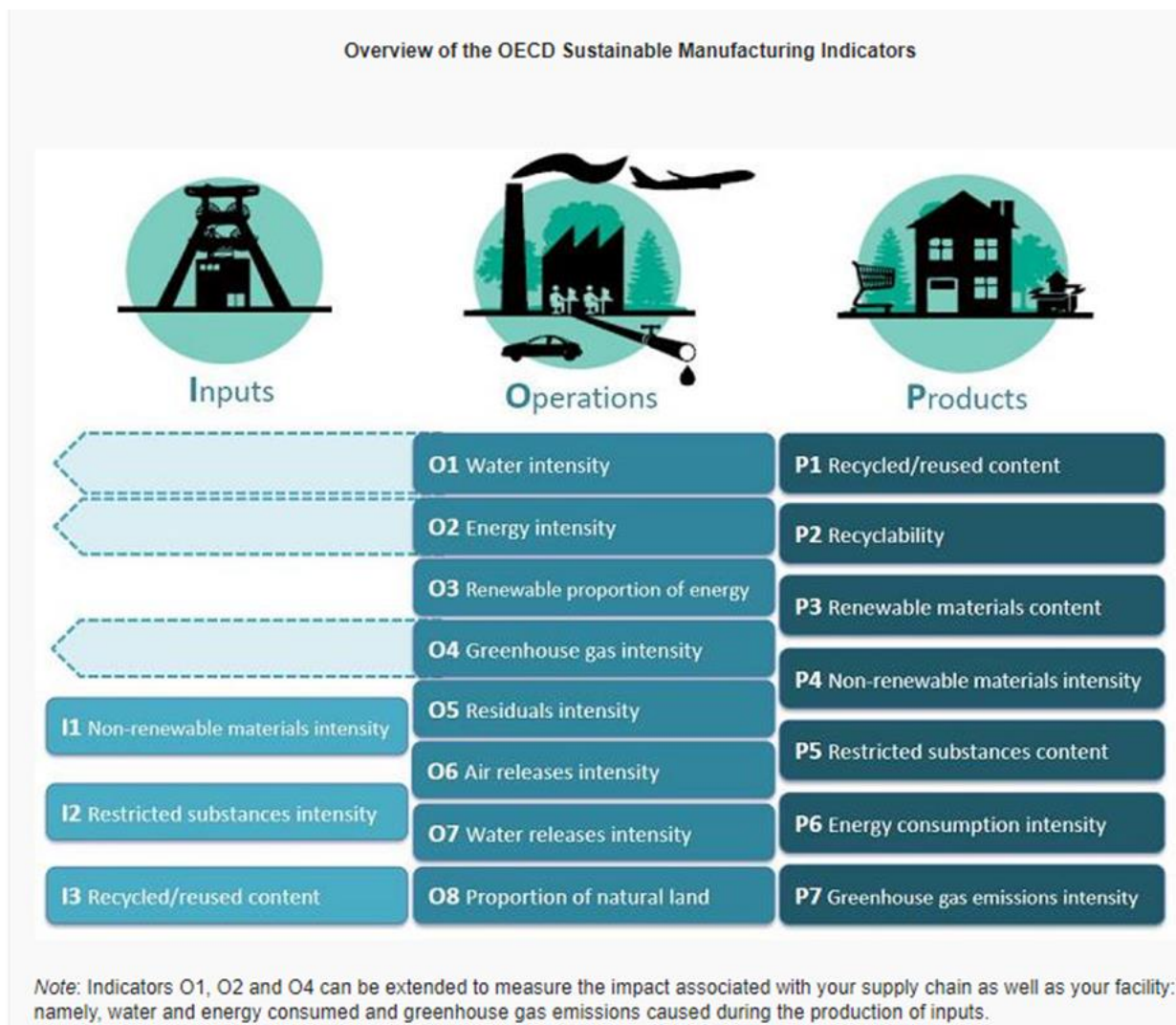
Resources

Energy and the circular economy

39. Managing operations in an environmentally and socially responsible manner – “sustainable manufacturing” – is no longer just nice-to-have, but a business imperative. Companies across the world face increased costs in materials, energy, and compliance coupled with higher expectations of customers, investors and local communities. As such the OECD has developed a toolkit that highlights areas of development along the production process to facilitate businesses and support governments in the transition within the manufacturing sector. The area covers inputs, outputs and products as illustrated in Figure 4.8

Figure 4.8. The green transition of manufacturing must consider all aspects of the production process

Overview of the OECD sustainable manufacturing indicators



Source: OECD sustainable manufacturing indicators, <https://www.oecd.org/innovation/green/toolkit/oecd-sustainable-manufacturing-indicators.html>

40. Based on METS, Manufacturing uses 57% of national energy meaning it is crucial as part of the wider green energy transition and it is positive to see that it is a central part of the national industrial strategy. OECD find within Slovenia the majority of the GHG emissions are derived from non-metropolitan regions close to large city such as the region of Podravje in this study. (OECD, 2021^[17]) At the time of the study visits in September 2022 all companies in the regions studied mentioned the disadvantages of not being part of the EU temporary oil price cap and thus losing their comparative advantages to other EU regions such as Spain. With the addition of supply chain disruptions from COVID-19 just prior, these firms felt an increased pressure to deliver on agreed contracts or otherwise face being replaced.

41. Currently Slovenia is a country not particularly endowed in fossil fuels. It imports almost all of its oil and natural gas, the latter of which is purchased through long-term contracts and trading hubs in Austria and Italy. Indigenous energy sources – in the form of domestic coal, nuclear power, hydropower, and renewables —satisfy slightly more than half of Slovenia’s energy needs. In 2019, nuclear and hydropower

were the primary sources of electricity generation (accounting for about 36% and 29% of national electricity generation, respectively). The nuclear PP Krško, the thermal powerplant Šoštanj and the hydro powerplant Dravske Elektrarne are the main power plants in Slovenia. These power plants are either fully or mostly state-owned. The electricity distribution system is owned by five distribution companies that are also largely state-owned. (OECD, 2023^[18])

42. Over a longer time, horizon Slovenia is considering the transformation of its energy sector to greener sources. On average, Slovenian regions decreased their emissions by 0.18% per year between 1990 and 2018. This is below the 1.93% yearly reduction rate needed to reach the EU target of a 55% reduction in emissions by 2030, with respect to 1990 levels. Utilising know how from the private sector may speed up this process. Currently, with regards to green energy generation firms across the regions note that whilst the ambition to decrease CO₂ ambitions by 79% is admirable, current green energy production is deemed unstable. In Goriška, the potential of wind energy is amongst the highest among OECD regions in terms of mean wind power density and is being underutilised where the OECD average is 8% sourced from wind power and the Slovenian average is 0.04%. Similarly, in Podravje and Koroška, when considering solar power potential through Global horizontal irradiation, there is much potential. Slovenia has begun exploring this and at 2%, it is not far behind the OECD average of 3% of generation from this source.

43. To aid with this transition a range of EU funds and programmes are being utilised such as the EU fund Interreg: Greener Europe, LIFE: Circular Economy and Quality of Life and NextGen EU: clean technologies and renewables, energy efficiency of buildings though a clearer understanding of each stream could benefit its utilisation.

44. More broadly, water governance measures in Podravje are currently a challenge and highlighted amongst the low carb and greener region's goal in their regional strategy as promoting sustainable water management. Whilst the "Agreement for regional development" finances the implementation of municipal projects such as investments in water pipelines and sewage systems, a more strategic look at water usage may be beneficial. The OECD water governance initiative (OECD, 2018^[19]) provides an effective inventory of existing tools, practices and guidelines to foster effective governance in the water sector and a focus on the role of cities is established in the earlier 2016 report which discusses the connectivity with rural areas (OECD, 2016^[20]).

45. Industry adoption of greener technologies in the production process is another stage of the transition. The industrial strategy notes that energy intensive sectors are very good at adapting best available technologies relative to their EU counterparts. This is a promising start. However, across the regions, particularly highlighted in Podravje and Koroška, small farms that have manufacturing as an additional activity are not thinking about climate change and limit their activity to follow necessary regulations. Based on existing strong relationships, the relevant chambers of crafts and commerce and the LEADER programme are good sources to build cultural change. Learning could be extended from the organic farms, noted to be twice as big as the regular farms, show initiatives in advertising their products at fairs, schools, retirement facilities etc. This has been relatively successful in Goriška where the chamber of commerce notes the agility of their large share of SMEs as a source for easier adaption of green technologies such as green energy pumps. Box 4.3. provides good practice examples from manufacturing firms across OECD countries.

46. The final point relates to the role of the national and regional governments to support the transition of the economy to the production of more sustainable outputs. Broadly, As S5 (Sustainable Smart Specialisation Strategy for Slovenia) is the enabling condition for the preparation and endorsement of the Operational Programme in Cohesion policy 2021 – 2027 in Slovenia, all the activities on regional and local level should be aligned to or with it. Podravje has shown great interest and participation in the related SRIPs of Circular Economy and SRIP Smart Buildings and Home including Wood Chain. It is separately noting sectors of potential for example providing support to the Aluminium sector as "metal of the future"

(unlimited recycling). The region of Koroška is focusing on the processing of mining outputs which is a high energy consuming sector. Linking their wider ambitions of being ICT focused to environmental goals could tackle two birds with one stone. In addition, the faculty for polymer technology represents one of the hubs for development of new materials as part of the focus on circular economy and reuse-reduce-recycle principles as well as one of the major suppliers of TAB rechargeable batteries being stationed in the Koroška region.

Box 4.3. Good practice examples

Area 1: Reducing inputs for production in the first place

Wausau Tile (Wausau, Wisconsin, United States) manufactures architectural products for the global market, such as: plastic site furnishings; precast concrete and metal site furnishings; concrete pavers; terrazzo tile; and precast terrazzo. The company wanted to reduce the use of natural raw materials and save costs at the same time as part of its “green initiative.” It investigated the possibility to find alternative aggregates to mix with concrete, where gravel is normally used, and found a process to treat glass for that purpose.

Wausau Tile considered trying used glass as a new concrete aggregate. Of all the collected post-consumer materials, glass has been one of the most difficult to recycle and much of the used glass ends up in landfills. Even though using broken glass can lead to additional costs, the company believed that any extra cost could be offset by the decorative value of the material, by developing new products, attracting new customers and reducing the environmental impact. With this in mind, the company managed to include large glass chips in their products that were large enough to be architecturally and aesthetically valuable.

The company has redesigned a number of their products incorporating used glass as an aggregate such as: benches, tables, planters, concrete pavers and terrazzo tiles. The glass aggregate accounts for up to 56% of the total product weight or volume in some products. In 2009, the company used about 450 tonnes (500 US tons) of post-consumer/post-industrial glass, creating a market for used glass and attracting customers. Following this success, it has recently introduced a new line of products that use post-industrial porcelain like sinks, bathtubs and toilet bowls as an aggregate.

Area 2: Improving the efficiency of facility operations

MG Rohr (Koroška, Slovenia) is a company with more than ten years of business tradition in the field of specialised supply of seamless and seamed pipes and other special materials and semi-finished products for the automotive, metal, construction and other industries.

This company focuses on recycling substantially. Specifically 95% of all material is recycled. In addition all of the energy produced is recollected to reheat the buildings. Circular economy efforts are leading to mass savings on materials and electricity costs.

Area 3: Improving products to reduce impact in use and at the end of life

STG Aerospace Limited (Cwmbran, Wales, UK) develops aircraft emergency and cabin lighting solutions for the aviation industry. An SME of 80 located in a rural area, the company focuses on research and development with over 75% of its workforce holding a degree level education or above. The company, since its creation in 1995, has supported and secured over 100 global patents - granted and pending - covering all product applications and designs in aerospace.

One such area of research relates to the production efficiency of their emergency exit marking systems. STG Aerospace began with wide, heavy, engineering focused designs. These overtime, had been analysed from all perspectives. This led to STG reducing the size and thus the amount of plastic used and continuing research on the chemicals and materials used for the photoluminescent assembly, aiming for them to be derived from more environmentally friendly sources.

The company hosts a range of laboratories and test facilities for their research as well as the final production plant all being located on the same site to increase agility and control. Most successfully, the performance of products has remained at the highest of standards, receiving supplier awards from

their biggest customer Boeing, for the past ten years. In addition, postproduction services are also co-located to ensure continued airworthiness of products are offered as well as lengthy guarantees.

Area 4: Producing green goods within the region

(Impol, Podravje, Slovenia) is an Aluminium factory primarily with around 1500 employees across its sights and a turnover of over €350 million. Operating for almost 70 years Slovenia, 95% of its output relates to import-export market. As such a particular focus is given to regulations in Germany than Slovenia.

Considering aluminium as the metal of the future i.e., can be recycled indefinitely, it hopes to utilise technological progress (including increasing automation and hiring of workers with digital skills) to produce this at the upmost efficiency – currently it ranks second only to Norway globally.

Hosting its own gas house provides the company with one of its comparative advantages however with support from the Podravje chamber of commerce, it is considering means of reducing the related emissions. The chamber of commerce facilitates connection and cooperation between companies to help formulate strategic innovation partnerships.

Source: [WAUSA Tile](#), [MGRohr](#), [STG Aerospace](#), [Impol](#)

Land use

47. Land in rural Slovenia is focused on the preservation of food production. The future viability rural areas will largely depend on the properly market-based and politically evaluated contribution of farmers and other land managers to the well-being of society, i.e., their role in the preservation of a healthy common living environment as well as natural and cultural heritage. Historically, Slovenia was characterized by a strategically determined polycentric development of society, which brought an industrial plant and jobs in the countryside to every slightly larger settlement. This supported the structure of mixed farms and made it possible to raise the general standard of living in rural areas. In the transition process, however the vast majority of these plants failed and thus in many parts of the countryside that are not close to urban centres, agriculture has remained the only economic activity. (Erjavec and Rac, 2021^[11]) However, across the regions studied there are excellent examples of new industrial plants, including high-tech ones, which maintain the demographic structure in their areas and offer different development alternatives. But these firms are facing challenges relating to permits for expansion and for housing.

48. Firms in Podravje noted that even for small facilities (such as Skylabs where 90% of staff focus on R&D thus limited production space is required) permits are difficult and untimely. This is despite having officially over 60 business zones. Within this it was noted only 2 were operationally managed. The demand for these sights is high as the region is strategically located and ideal for logistics. The challenge extended beyond administrative reasons for permit delays and included issues relating to the consent of all neighbours which was often challenging, and environment assessments were demanded to be thorough. As such building permissions were considered as key to stopping investment executions for up to 2 years. A suggested solution related to the division of labour by size of task is for municipalities to be responsible for the approval of small projects and wider works to remain with state level spatial planners. In the Goriška region, in addition to the above permit delays, concerns were raised specifically regarding the landowners of the protected areas where there would be benefits from higher levels of co-ordination. In Koroška whilst industry overall covers 70% of the economy, reorientation towards ICT was partly driven by limited requirement for land. At the same time, they have adapted a strategy to give the available land to the companies that will provide the higher GVA and R&D. Housing for workers is also very challenging. Goriška noted that despite being able to attract migrant workers, suitable accommodation was hard to develop and come by. Apartments in Koroška were also seen as a barrier to development.

49. What is necessary is matching the sectoral policy more concretely with spatial planning. Consultations from the spatial planning agency are ongoing and yet to reap rewards, the pace of this is frustrating to some local stakeholders. There needs to be a clear vision that effectively balances the development with the preservation of natural and cultural heritage. One such positive example comes from the region of Brandenburg in Germany that actively involves the ministry of planning. Brandenburg is seeking for a stronger orientation towards the specific profile of an industrial location with its special features and its regional differences such as land use and availability. With the development of Industrial Policy Guidelines in 2019, Brandenburg made a step towards strengthening the state by mastering economic, ecological and social challenges. Their plans are directly discussed and matched with the Ministry of Infrastructure and Regional Planning and the Ministry of Agriculture, Environment and Climate Protection.

Access to capital

50. One of the largest barriers to development, particularly for SMEs is appropriate access to funding. Credit for innovative production can be hard to access due to its risky nature. Slovenian SMEs employ 73.2% of the workforce in the business economy (486,458 people) and produce 65.3% of the value added (EUR 15.8 billion). Micro firms account for more than one third of all employment in the business economy, while the shares of large firms in both employment and value added are below the OECD average, in line with the small size of the economy. The Ministry of Economic Development and Technology provides guarantees for bank loans and interest rate subsidies through the Slovene Enterprise Fund (SEF). Besides funding through Fund of Funds (ESIF), SEF implemented guarantees for bank loans with interest rate subsidies, grants for start-ups and so called “vouchers” – support for SMEs in small amounts up to 10,000 EUR (OECD, 2022^[21]). As of 2021, SEF had a guaranteed volume of around 310 million euros and supported almost 2,400 SMEs (AECM, n.d.^[22]). Loans for SMEs are also provided by the Slovenian Investment and Development Bank (SID), which is responsible for developing, providing and promoting innovative instruments and long-term (direct and indirect) financial services (OECD, 2022^[21]). Only very little autonomy is provided to the region in utilising funding sources at every level. Structural and substantive obstacles are conditioned by national regulations which leads to various stakeholders on regional level not being able to access funds. On regional level, administrative and financial burdens should be simplified to get faster refunds and in advance payments to attract more micro beneficiaries and also for local municipalities to implement more and larger projects.

51. The Slovenian Regional Development Fund (SRDF) promotes projects in entrepreneurship with incentives for priority areas of regional policy in order to reduce growth disparities, increase competitiveness and increase or maintain number of employees. As a result, the focus of the fund is the regional development priority areas and border problem areas while aiming at entrepreneurship, competitiveness, market orientation and technological development of companies. The fund has two strategic directions one being used by the as a policy tool for the grant management with the public tenders for loans and being a tool for the European development processes with functions of the certifying authority and as preparation and implementation of projects co-financed from the EU and outside the EU budget. The grant programmes are formed in the scope of entrepreneurship, agriculture and forestry, financing of municipalities, prefinancing of the EU funded projects, incentives to projects within the areas of the Italian and Hungarian minorities while the fund also acts as a guarantee’s provider for approved bank loans for entities of various legal and organisational forms.

52. There are also a range of other small funds for SMEs. Whilst some business owners considered the funds bureaucratic to access, many disagreed. Often through the schemes the same firms applied, and the same ones did not at all. However even direct funding may not help this case. For example, processing, marketing and developing products for micro funds to encourage supplementary activities falls under MAFF. These are directed towards young farmers and primarily small firms. What was noted at the regional level, however, was that these funds were not being used as hoped for but rather to buy farm

equipment such as tractors. In other words, the question related not so much to access but to business ambition where a large share of the SMEs considered expanding too risky and complicated. In Koroška, it was noted that only 10% of SMEs were interested in scaling up.

53. Hand in hand with providing SME funds, further activities to encourage a culture of entrepreneurship is a necessary focus. Strong leadership and co-ordination of the broader SME policies are needed to accelerate scale up speeds. Means to foster this are expanded in the business environment section below.

Key takeaways: Resources

- The green transition of manufacturing must consider all aspects of the production process relating to inputs, operations and products.
- With regards to inputs, OECD find within Slovenia the majority of the GHG emissions are derived from non-metropolitan regions close to large city (such as the region of Podravje in this study) and indeed METS recognise manufacturing uses 57% of national energy.
- Much of Slovenia's energy comes from nuclear and hydropower yet emission decreases, at 0.18% per year between 1990 and 2018 were below the 1.93% yearly reduction rate needed to reach the EU target of a 55% reduction in emissions by 2030.
- There is strong underutilised potential of wind energy production in Goriška and solar energy potential in Koroška and Podravje. Recent attempts at creating green energy have formed unstable supplies for manufacturing firms. Greater public-private partnerships could aid this process. In addition, the OECD water governance initiative can help Podravje with its related challenges.
- In terms of adoption of greener manufacturing processes, across the regions - particularly highlighted in Podravje and Koroška - small farms that have manufacturing as an additional activity are not thinking about climate change and limit their activity to following necessary regulations. Learning from the LEADER programme could be extended to help with this as well as more large-small firm linkages.
- The national government has played an essential role in highlighting how to reorientate manufacturing production to more sustainable outputs such as increased focus on the wood sector. Podravje is showing great interest in this as well as noting the potential of aluminium the unlimited recyclable metal of the future. Future and further links of Koroška's faculty for polymer technology with industry will also be exciting to see.
- Land in rural Slovenia is focused on the preservation of food production and cultural heritage protection, making permits for production and housing challenging to acquire, which deters investment. The outcomes of the consultation with national spatial strategies should help better align with regional ambitions to overcome these bottlenecks.
- With regards to access to capital this was not the core issue as anticipated but instead related more so to business ambition. A small handful of firms applied to the many grants available whereas a large share of the SMEs considered expanding too risky and complicated. In Koroška it was noted that only 10% of SMEs were interested in scaling up.

Business environment

Industrial districts, clusters and networks

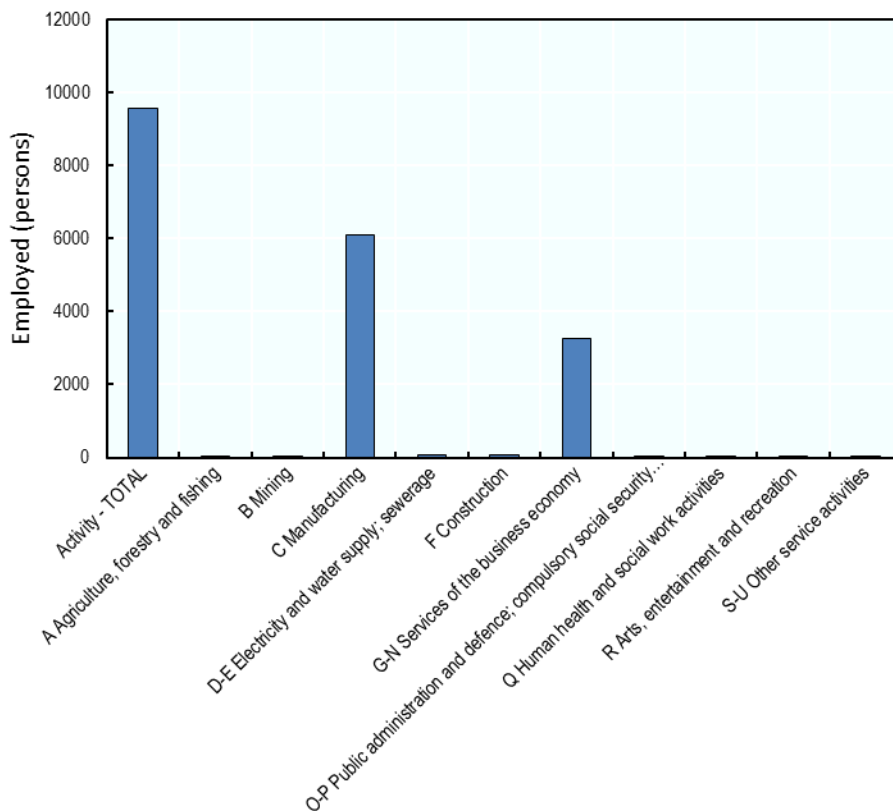
54. The manufacturing sector is the largest contributor to national R&D employment and expenditure, across OECD countries it can be seen that whilst Slovenia ran in the middle of the pack in 2013/2014, in the latter years it is amongst the lowest with respect to R&D expenditure as a share of GDP (Figure 4.10).

55. In 2020, Slovenia's spendings on R&D represented 2.14% of its GDP, ranking behind the EU average (2.19%) and the OECD average (2.67%). 1.57% were registered as business enterprise expenditures on R&D representing 1,314.8 million USD which puts Slovenia far behind compared to other OECD countries according to the OECD STI Scoreboard. According to Figure 4.11, 2.17% of the total

workforce was employed in high-technology manufacturing firms in 2019 representing around 6,000 employees in total (Figure 4.9). More than half of R&D research professionals are active in the business sector (61.4%), which is more than the European average of 55.3%. Slovenia's firms have a strong focus on innovation collaboration. According to the STI Scoreboard, Slovenia ranks 1st in international collaboration with 40.1% of manufacturing firms cooperating on innovation activities followed by Estonia (37.8%) and Austria (36.1%) (OECD, 2022^[23]).

Figure 4.9. R&D employment is concentrated in the manufacturing sector

Total R&D personnel in the business enterprise sector by sector, 2016

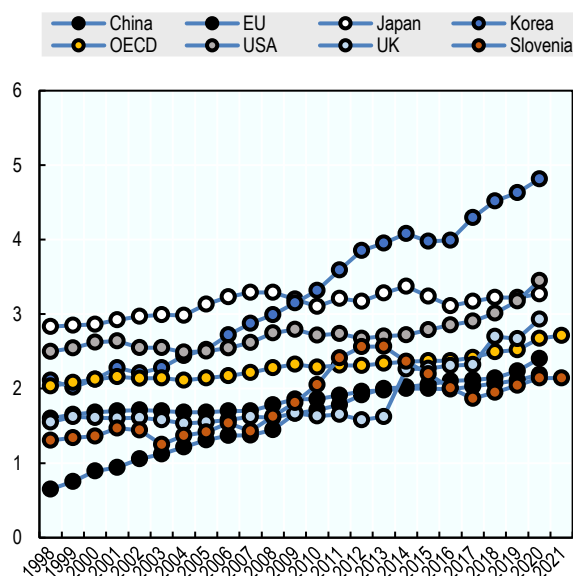


Note: Industrial grouping G-N includes sector M: Professional scientific and technical activities

Source: [Statistical Office of Slovenia \(SiStat\)](#): Table 2364105S.

Figure 4.10. Slovenia has fallen behind in R&D as share of GDP compared to OECD countries over the recent years

Gross domestic expenditure on R&D (GERD) as a percentage of GDP for selected OECD countries, 1999-2020

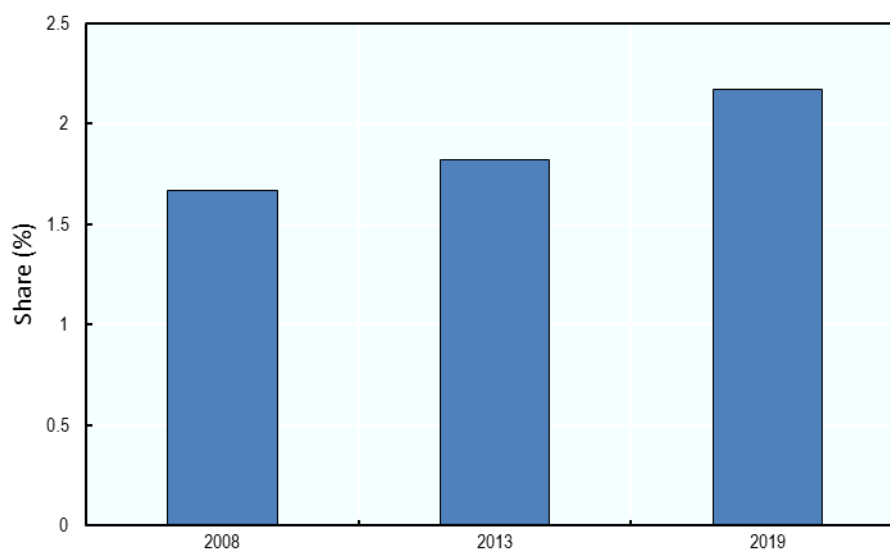


Note: Gross domestic expenditure on R&D (GERD), totals all expenditure on inputs used in performing R&D, in a given territory.

Source: OECD, Main Science and Technology Indicators Database, <http://oe.cd/msti>.

Figure 4.11. The share of employment in high- technology manufacturing has been increasing

Share of employment in high-technology manufacturing Slovenia (in % of total employment)



Source: [OECD.Stat](https://data.oecd.org): Regional Innovation: Knowledge and high technology industries (last access 30 March 2023)

56. Slovenia has a range of policies to try and promote innovation, on last count from the OECD there were 111 policies and initiatives related to this, amongst the highest number from OECD countries. (EC-

OECD, 2023^[24]). For example, at the national level, for more than twenty years the granting of awards and promotion of the best Slovenian innovation has been in progress in Slovenia, a process which ends in the selection of the best national innovation. Awards for innovation not only bring recognition to award winners and promotion in Slovenia and abroad, but they are also interconnected with other related initiatives, therefore the project should be continued, accelerated and upgraded with additional content activities.

57. However, as the outcomes are not reflected in the expenditure figures it may be necessary to think more locally. To build a culture of innovation that permeates into regions, industrial districts are vital as they provide easy environments for innovation networks and innovation investment.

58. In the Goriška region, the chamber of commerce plays an essential role in bringing the relevant stakeholders together. It also works to encourage cross border collaboration through programs such as “The Saturday day of technical centre” connections and wider mentorship programmes. In addition, awards for “start up of the year” alongside neighbouring regions in Italy and Austria show great promise. However, focusing on a few sectors for clusters is not the priority. The Goriška region feel that they have many diverse successful entrepreneurial stories that have outgrown the regional framework, for example: the aviation industry, the world's leading manufacturer of chromatographic columns and a provider of innovative technologies for the production of biological medicines, a global provider of integrated solutions for the automotive industry, design and production of lighting, tourism, and development of Hydrogen technologies. Representatives in Goriška note the need to introduce advanced technologies to reach their potential, however, attempting to support a wide range of industries may strain already limited resources.

59. In Koroška, there are business zones holding different activities to attract entrepreneurs. There is also an incubator located in 4 municipalities managed by the RDA. Koroška is well connected with EU Horizon projects to encourage partnerships across the EU. However, it is noted that collaboration is often between medium or large companies and thus initiatives to link SMEs to universities is encouraged. In addition, whilst a few initiatives with Austria exist, there is limited capacity to engage in cross border networks. Increasing these will allow for effective knowledge sharing which may provide solutions for regional burdens identified.

60. In Podravje there are good cluster policies and existing policy hubs that encourage networks across the sector through the SRIPs. In addition, they are in contact with other members of Enterprise Europe Network: technology poles, innovation support organisations, universities and research institutes and chambers of commerce and industry. Cooperation takes place on operational level through the exchange of contact details for customers, answering the questions regarding business cooperation, innovation, participation of companies in EU programmes etc. Coordination is developed through a national coordinator. Podravje also has Smarthub Maribor which contains incubators, soft programmes and social programmes however the management of this and the zones can be significantly improved.

61. In most cases initiatives are sectoral focused however one successful geographical initiative relates to the Good Morning Neighbour scheme that encourages neighbouring CEOs to share breakfast in each other's facilities to share knowledge and ideas regardless of their sector. In addition, regions bringing local stakeholders in the cultural production is also to be encouraged. the centre for creative design management, which encourages art thinking yet only a small percentage of the work materialises as end products. It is essential thus to build a brand and the chamber of commerce noted that it was difficult to get companies to come to this project.

62. It is noted that many of these Slovenian centres are not globally competitive. To maintain increased competitiveness, the level and degree of innovation can be increased. One thing that can help this is the use of regulatory sandboxes that can create real disruptive innovations and form new methods such as cognitive computing. Linking R&D and EU state aid to help formulate demo plants can be a good initiative. Linking these developments from incubation directly to industry is also a step that regions can expand on.

Box 4.4. Sandboxes for disruptive innovation

Regulatory innovation sandboxes

An innovation sandbox is a type of regulatory sandbox that encourages innovation, holding several regulatory requirements on pause while innovators experiment whether outcomes of innovations solve greater issues or prove that regulations are needed. Regulators across the globe are using regulatory sandboxes to provide a safe environment for emerging technologies to develop without the full burden of regulatory boundaries.

A recent report showed that they tended to serve as a base to test the necessity of regulations, facilitate firm start-up entrepreneurship and foster new partnerships. A few examples include a fintech sandbox in Australia and a digital sandbox in the UK. Additionally, initiatives in the agri-tourism sector of the Jura region of Switzerland fit a similar definition.

Fintech sandbox in Australia

The Australian government established an Australian Licensing Exemption Scheme through the Australian Securities and Investments Commission (ASIC) that allowed exceptions for eligible fintech companies on certain products and services for up to 12 months without a license. This allowed firms to begin operating quickly, with low barriers to starting a new fintech company through lower compliance costs. The firm is required to notify ASIC of its plans but remains momentarily free to experiment with the product and services offered.

Digital sandboxes in the UK

Starting with the beginning of the global COVID-19 pandemic in May 2020, the Financial Conduct Agency in the UK began piloting a “digital sandbox”. The initiative is currently in its initial stages, attempting to provide guided support for firms looking for a digital testing environment with the aim of addressing some of the challenges of the pandemic. The initiative has a specific goal and is administered through a call for applicants who are given the right to participate based on whether their aim to accomplish one of the goals of the administration includes preventing fraud, improving the financial resilience of consumers or providing access to finance for SMEs.

Regulatory exemptions in tourism in the Jura region, Switzerland

While not directly marketed as such, two examples of regulatory sandboxes with the specific target of developing the tourism sector are found in the mountainous region of the Jura in Switzerland. Both initiatives were driven from the bottom-up and included the co-ordination efforts of the regional innovation system agencies.

A first example was built in collaboration with TalentisLab, which requested an exemption from environmental protection legislation that limited activities associated with ecotourism. After an application for exemption and a call for proposals, a new initiative to encourage eco-responsible tourism in the provision of campsite accommodation is being put into place.

A second example involves temporarily lowering prohibition from visiting publicly protected places while visiting local towns. The initiative provides access to a “secret route” ([circuit secret](#)) to groups of tourists that have acquired digital keys. The community of Porrentruy, in collaboration with the RIS agency services, worked on reducing regulations on access to public places that may be of interest to areas with an increase in tourism. This has allowed the town of Porrentruy, whose business was strongly impacted by the COVID-19 pandemic, to gain visibility and attractiveness.

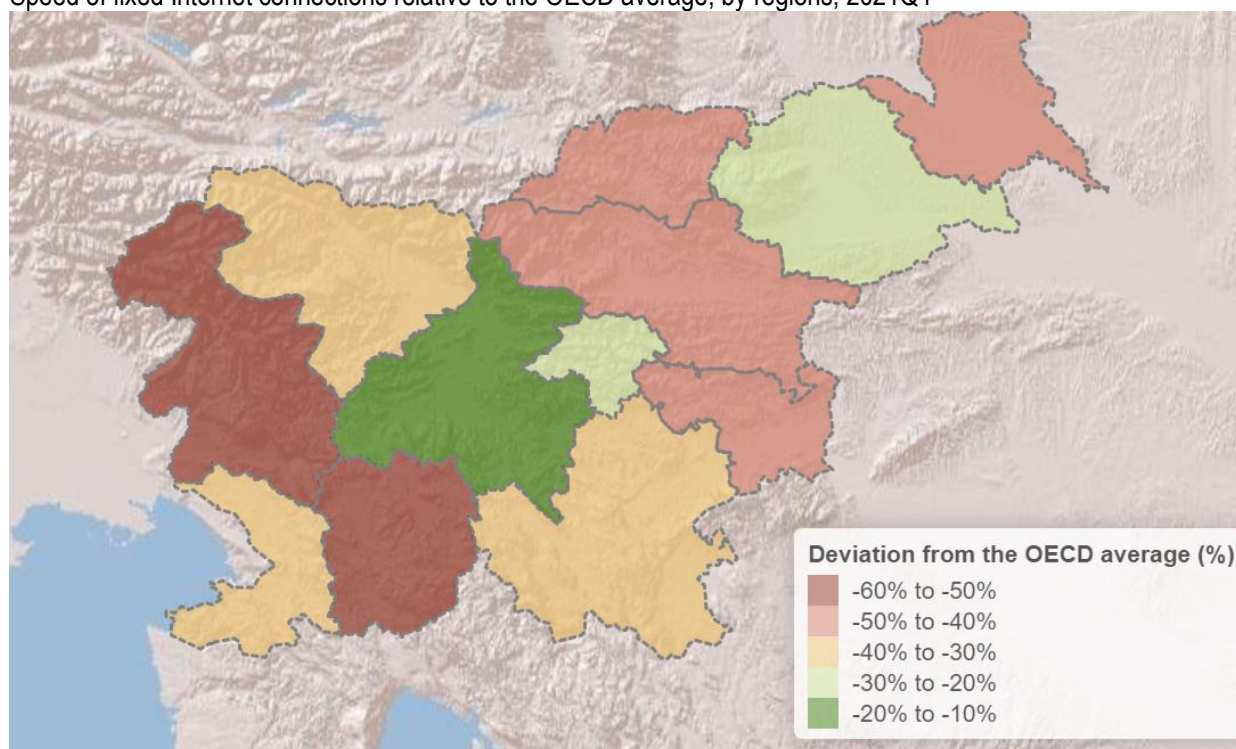
Source: OECD rural innovation, forthcoming

Digital and physical infrastructure

63. Currently rural areas in Slovenia face challenges in both aspects. Figure 4.12 notes fixed Internet connections in Slovenian cities and rural areas deliver speeds significantly slower than the OECD average (-15% and -44%, respectively). This gap (29 percentage points) is smaller than in most other OECD countries. To meet its objective of becoming one of the five most digitalised European Union countries, Slovenia will need to expand access to affordable high-speed internet, improve digital competency among the general population and skills among workers, and increase firms' adoption of digital tools.

Figure 4.12. Slovenia has a digital divide between rural and more urban places, overall falling below OECD averages

Speed of fixed Internet connections relative to the OECD average, by regions, 2021Q4



Note: Internet speed measurements are based on speed tests performed by users around the globe via the Ookla Speedtest platform. As such, data may be subject to testing biases (e.g., fast connections being tested more frequently), or to strategic testing by ISPs in specific markets to boost averages. For a more comprehensive picture of Internet quality and connectivity across places, see OECD (2022), [“Broadband networks of the future”](#).

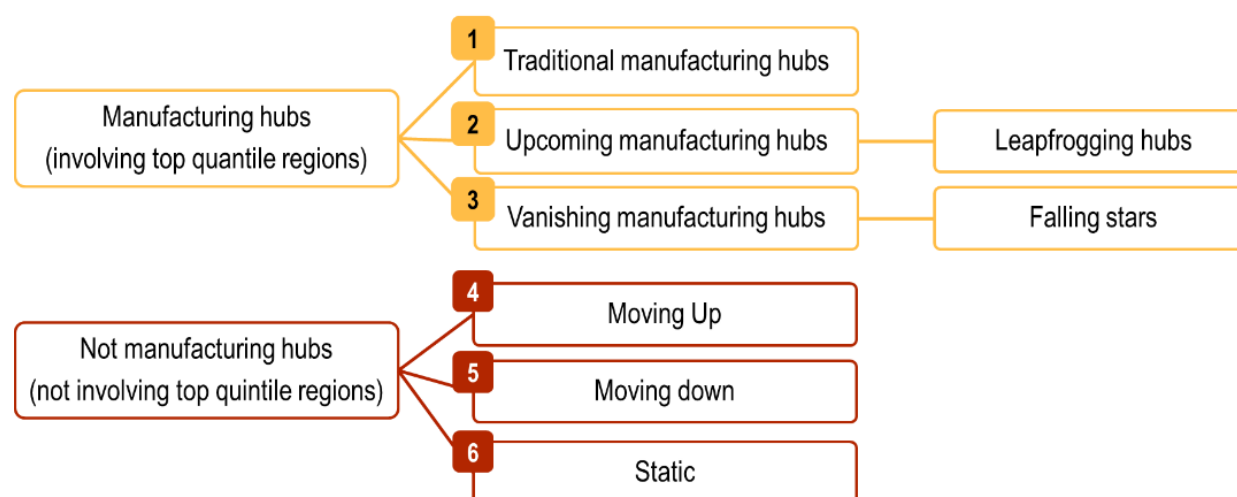
Source: OECD calculations based on [Speedtest by Ookla Global Fixed and Mobile Network Performance Maps](#) for 2021Q4

64. Whilst the national level is working on urban-rural linkages to improve the quality of life, the regions express difficulties today. In particular, Goriška describes challenges from its topography relating to high service delivery costs. As local investment budgets are low, 11 municipalities have come together and pushed 13 projects to the state with the majority relating to railway connections. The challenging border region funds are not provided to Western Slovenia however, with strategic spatial planning and support from the national level, the region can easily reach its potential. The region is considered unattractive

through lack of amenities for young people such as bars and restaurants however it is common that these naturally occur once good connectivity has been established.

65. Koroška has faced challenges relating to the long-awaited highway. In the meantime, as within its strategy the region wishes to focus on the ICT sector, the use of cloud computing being encouraged by chamber of commerce. However, uptake is slow which may in part be related to the available infrastructure. Many of Koroška's derelict rail route are being utilised for cycling tourism however there may be potential, with support from the national government, to recapture these as rail routes to improve the region's connectivity with the rest of the country and the capital.

66. The Podravje region is strategically located within central Slovenia with good routes to its town of Maribor and lucrative access to the eastern part of Europe including western Balkan region. It also boasts perfect logistic infrastructure and world class ICT properties. It has focused recently on the development of an airport which, given the size of the country may not provide value for money. Instead, the developing routes across borders may be more relevant to match GVC ambitions with the relevant markets.



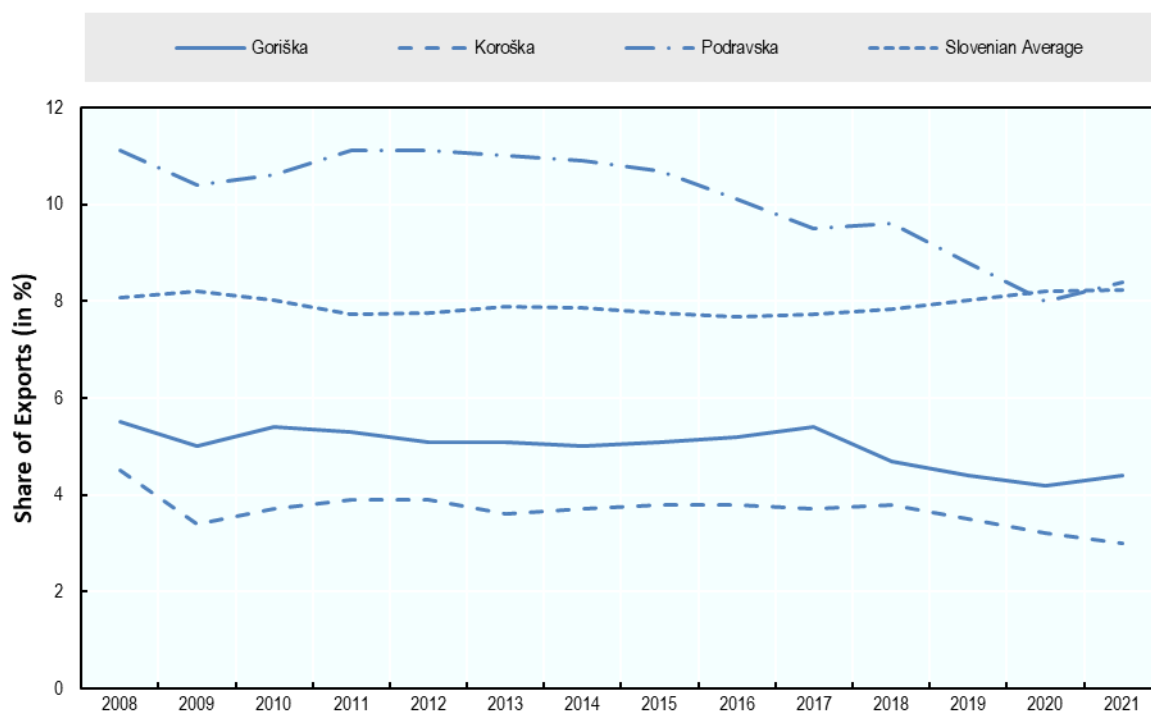
67. This is already beginning to be considered in Goriška where they are linked with Italy and the Adriatic coast, but mayors think more can be done about cross border opportunities. As the METS places more focus on digitalisation, Podravje would like to see a toolbox: a set of green and digital criteria that could be used by EU member states for the public calls.

Market structure and export orientation

68. Figure 4.13 shows that both Goriška and Koroška are much less export orientated than Podravje, but all regions have seen a decline in the last few years. Whilst the decline in the latest of years is explainable in part to the challenges relating to COVID-19 and the disruption of supply chains, the data below indicate this decline has commenced closer to 2017. This has not been the case for the Slovenian average, indicating a reallocation. Further investigations could identify the cause and provide relevant solutions.

Figure 4.13. Exports have been slowly decreasing

Proportion of exported goods by region, 2008,2021



Source: Slovenian office for statistics, <https://pxweb.stat.si/SiStatData/pxweb/en/Data/-/2640005S.px>, (last access: March 2023).

69. In 2022, according to the OECD Services Trade Restrictiveness Index, Slovenia scored an all-sector average index of 0.244, which is above the OECD average and slightly above the average of all the countries in the STRI sample. Insurance services is the most open sector in Slovenia (0.152) while engineering services is the most restricted (0.378) (OECD, 2022^[25]). Looking at which measures contribute to the scores, restrictions on foreign entry and on the movement of people are predominant. A general regulation that contributes to the STRI in all sectors is the short duration of stay for non-EU nationals seeking to provide services on a temporary basis as contractual services suppliers as they can stay for a maximum of three months in Slovenia on their first entry permit. Other restrictive regulations include a restriction on the acquisition of real estate by foreigners and minimum capital requirements to register a company. Since 2016, Slovenia introduced a couple of regulatory mechanisms to increase transparency, non-discrimination and foreign investment, the regulatory framework for services trade tightened moderately (over the period of 2014 until 2022) (OECD, 2023^[26]). Concerning digital services, Slovenia scored an index of 0.181 in 2022, ranking 29th out of 38 OECD member countries. The greatest barrier affecting Slovenia's digital services is infrastructure, which accounts for 87% of the index score (0.159) (OECD, 2022^[27]).

70. The Strategy for Smart Specialization has been adopted at the national level and redefined as S4. It represents a platform for focusing development investments in areas where Slovenia has a critical mass of knowledge, capacities and competences and in which it has innovation potential for positioning on global markets and thereby strengthening its visibility. Strategy will permit to create cluster for stakeholders in pre-defined areas of particular industries. The regional development documents formulated by the regional development agencies play a key role in identifying these sectors and then increasing their outputs including, in the cases of supply chain integrated manufacturing, the degree of global connectivity. Currently the strategy is being upgraded into Slovenia Sustainable Smart Specialisation Strategy S5, with

a stronger focus on sustainable development, and it is planned to be adopted by the Government by the end of 2023.

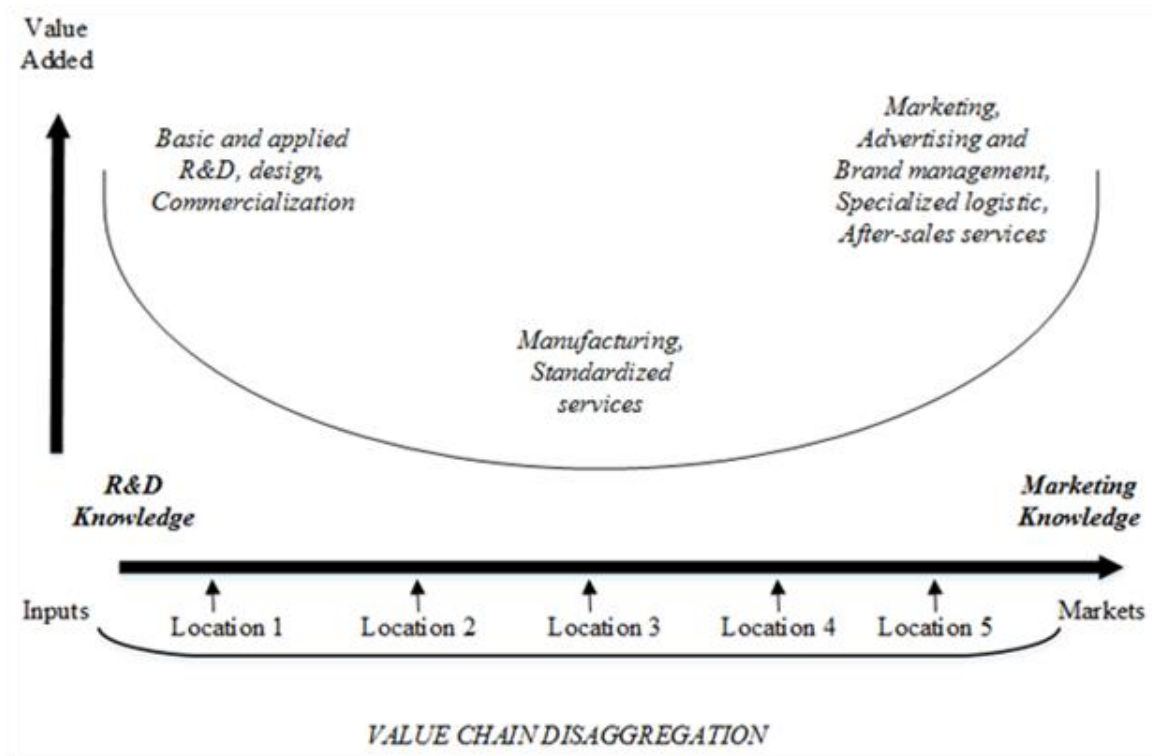
71. In Podravje, the focus relates to the production of sophisticated products. They are mostly from the following industrial sectors:

- Chemicals & Pharmaceuticals
- Electrical & Electronics
- ICT
- Logistics & Distribution
- Machining & Metalworking
- Wood-processing

72. The region has strong regional ambassadors and tools including websites ([Invest Podravje Slovenia](#)) and global fairs. And whilst the regional development agency is aware of the largest companies in the regions, it does not map the supply chains they have, losing opportunities for FDI-SME linkages. Such a system can also aid the better use of the existing clusters in the region, see box below.

73. In Koroška many firms are foreign owned providing good links internationally however the degree of high value chain production is conducted in the region compared to the less value adding components is unclear. Routine and less complex activities have located in more remote and cheaper locations, while more complex and innovative activities have concentrated more fully in urban areas to benefit from agglomeration advantages (Anas, Arnott and Small, 1998^[28]). However, in these circumstances, room remains for Koroška to benefit from these fragmented products by understanding the tasks that can be conducted within the existing firms such as the research and development of the manufacturing products or providing after sales services such as maintenance and repair. These such tasks are of much higher value added and build on the existing sectoral knowledge of the region whilst providing an opportunity to boost themselves further.

Figure 4.14. Looking beyond sectors, production should be focused on high value-added components



Note: The image illustrates the smile curve of value added in a production line

Source: (Mudambi, 2008^[29]), "Location, control and innovation in knowledge-intensive industries"

74. The Goriška region, as illustrated in earlier sections, focuses on a wide range of industries. In addition, has a large cultural heritage fund and an active chamber of crafts which can be further utilised to promote heritage products. Specifically, this can build on the cultural connection with Italy. Since part of the Goriška region was part of Italian territory for a long time, the industry that was developed (e.g., Gorica) was related to the needs and capital of the Italian market (e.g., the textile industry in Gorica and Ajdovščina connected with the supply of cotton via the port in Trieste and on the route where electricity supply was guaranteed).

75. Overall, the regions hold a range of manufacturing at both high-end technical production and cultural and heritage production often smaller and holding lower productivity. Thus, the support and advice differ along the productivity distribution:

- The lower tail of the distribution contains mainly artisanal and MSMEs where there is a role for the chamber of craft to help these firms promote the products they are creating and focus on expanding their product range or improving their production processes. There is also an opportunity to link small farm activity with tourism as well as production.
- Within the middle distribution it would be advantageous to focus on linking the existing firms to large or FDI firms through supply chain linkages, which will increase standards and productivity of these firms. For example, metal manufacturing firms in Podravje noted that they were forced to increase their standards to win contracts from companies such as BMW.

- At the upper tail of the distribution, it is encouraged to push further along the value chain ensuring a large share of time and employment within the firms relates to high quality research and development and limitedly on the production process itself.

Box 4.5. Increasing firm internationalisation in Portugal

Supply chain directory

The national Portuguese Suppliers Directory identifies Portuguese producers by sector/market/product/service across all Portuguese regions. In collaboration with local investment promotion agencies, the national directory is updated with the latest information on the firms in the sector and their production outputs so that collaborations are clear to identify. The main website is promoted on the local websites so that links are maintained through multiple channels. Specialisation of activities across regions in Portugal allows for collegiate co-operation rather than inter-country/ region competition.

Labour mobility

INOV Contacto programme (Portugal) is an international professional internship programme managed by the national investment agency in Portugal that places highly qualified graduates in foreign multinationals and Portuguese firms with offices abroad for a period of 6-9 months. The programme aims to support the internationalisation of Portuguese firms through the integration of highly skilled employees in their workforce and foster links between local firms and foreign multinational companies through labour mobility. The programme is structured in three distinct parts: 1) a startup one-week course on international management; ii) short-term internship in a Portuguese company; iii) long-term internship in a multinational company abroad. Since its establishment in 1997, the programme has sent more than 5000 young professionals to work as interns in Portuguese and foreign multinational companies, allowing them to sharpen their skills in an international environment while contributing to the transfer of knowledge and skills to the Portuguese labour market.

Source : Export Portugal Global, <http://export.portugalglobal.pt/xport/> ; Inov Contacto, <https://www.inovcontacto.pt/>.

Regulatory barriers

76. As noted, when relating to land use, regulatory barriers from a regional perspective are large. The lengthy time processes are causing difficulties in attracting and retaining investments. Forming stability and predictability, and normative regulation comparable at the European level has been identified in the latest industrial strategy as a clear goal. Linking with regions to achieve this will be critical.

77. Another regulatory barrier pertains to the process of becoming an entrepreneur. Several of the regions pointed to using regulatory loopholes relating to being an NGO to pertain self-employment status. Encouraging entrepreneurship requires the simplification of these processes.

78. Finally, regions identified the culture of gold plating. In essence this meant increasing regulatory standards above that of EU requirements as a means of signalling quality. However, firms pointed out this often led to significant delays or the avoidance of investment in this arena altogether leading to countereffects of the objectives. Allowing simpler standards may help see a rise in the relevant areas of investment.

79. On the other hand, firms point to regular changes in legislation that make it hard for them, as well as the local governments, to keep up. The aim of the changes is to keep up with wider evolving standards, however, a more systematic manner may help this process. This should be balanced so that the resources needed to do so do not fall on one area. For example, the national ministries note that the flexibility of some regulations has led to an increase in administrative burden.

Key takeaways: Business environment

- R&D employment is concentrated in the manufacturing sector and Slovenia has fallen behind in R&D as share of GDP compared to OECD countries over recent years. The share of employment in high-technology manufacturing has been increasing and Slovenia has one of the widest ranges of innovation policies across the OECD. Better use of the many industrial districts may help this as they provide easy environments for innovation networks and innovation investment.
- In Goriška, focusing on a few sectors for clusters is not the priority but not doing so may make it challenging to achieve the wide breadth of goals including increased utilisation of advanced technologies.
- In Koroska, collaboration is often between medium or large companies and thus initiatives to link SMEs to universities is encouraged. In addition, whilst a few initiatives with Austria exist, there is limited capacity to engage in cross border networks. Increasing these will allow for effective knowledge sharing which may provide solutions for regional burdens identified.
- In Podravje, there are good cluster policies and existing policy hubs that encourage networks across the sector through the SRIPs, however, the management of this and the zones can be significantly improved.
- To improve global competitiveness, the use of regulatory sandboxes can help create real disruptive innovations and form new methods such as cognitive computing. Linking R&D and EU state aid to help formulate demo plants can be a good initiative. Linking these developments from incubation directly to industry is also a step that regions can expand on.
- To meet its objective of becoming one of the five most digitalised European Union countries, Slovenia will need to expand access to affordable high-speed internet. Broadband connection in Goriška is particularly poor falling between 50-60% below OECD averages. Digital competency among the general population is lower in rural areas as is firm adoption of digital tools. The greatest barrier affecting Slovenia's digital services is infrastructure, which accounts for 87% of the index score on relating to trade restrictiveness.
- Physical infrastructure challenges differ across the study regions. Koroška has faced challenges relating to the long-awaited highway and aims to use its digital infrastructure to bridge this gap. However, addressing this connectivity is critical to link it to regions of strategic interest, as is beneficial to do so for Podravje which is strategically located to make the most of this. Goriška could benefit from rail connections across Slovenia and neighbouring border regions for industry as well as reducing the challenges of service delivery.
- Both Goriška and Koroška are much less expert orientated than Podravje, but all regions have seen a decline since around 2017. Mapping existing businesses in Podravje can help extend their supply chains and achieve their global ambitions. Extending this mapping across Slovenia can help foster internal unforeseen linkages. Koroska's manufacturing can benefit from a greater understanding of where its processes lie along the smile curve. As well as high technology production, Goriška can benefit from tapping into its cultural manufacturing of high value textile production.
- At the same time, simpler policies to become an entrepreneur and avoidance of gold plating may increase innovation dynamism across regions.

Governance

Data and monitoring

80. It is challenging to formulate a clear picture of Slovenian rural manufacturing with facts and data as there is not a distinctively clear definition of what Slovenian rural areas are. Monitoring and evaluation are essential tools to promote institutional dynamism and require data to do so. To date, formalised learning and set goals and timelines that allow for monitoring and evaluation does not occur in a systematic manner in all policy tools or strategies. As part of the Ministry of Agriculture, Forestry and Food, the Monitoring Committee is the main body responsible for data monitoring and evaluation of rural development policies. The Committee monitors the implementation and the progress in achieving targets based on impact and result indicators. Members of the Committee are stakeholders from public and private sector and NGOs working in the field of rural development and local communities. So-called “problem areas” with e.g., high unemployment rates have a prioritised support from the national level.

81. At the regional level, monitoring is mainly linked to project-level and key regional indicators pertaining to specific policy areas. The indicators by which the policies are monitored are set in the Regional Development Programme. However, data is scarce on a regional level. Regions mainly rely on data collected by national data providers. Their resources and capacity to collect more specific data or engage in specific evaluations are restricted and lack data usage and monitoring.

Financing

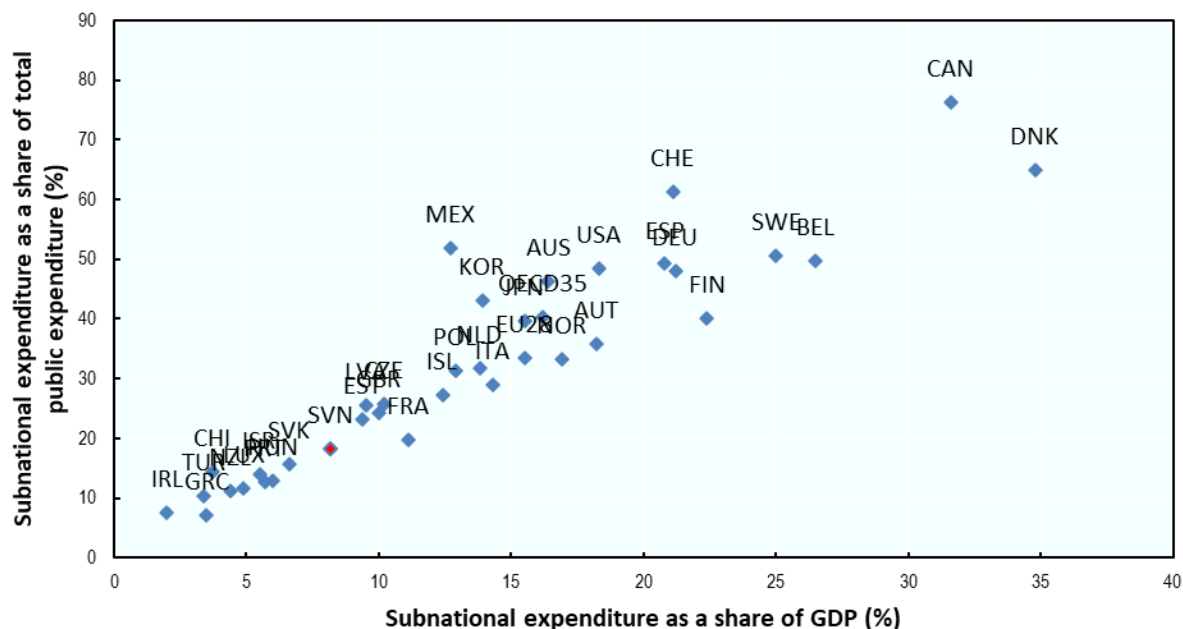
Many of Slovenia’s regional programmes are reliant on EU funds which often have a timeline of 5-7 years. Thus, there are no guarantees after this period and projects become unstable. Within the development of the project, means of replacing the EU based financing should be discussed including the role of the national government to support these projects instead of reliance on EU cohesion funds. Goriska particularly notes that they do not benefit from the EU problem area fund and thus broadly receive fewer financial funds to tackle their other topographic challenges. Providing non-financial support as well as financial from the national government may help fill this gap.

82. There are structural and substantive obstacles that are conditioned by the national regulations in accessing funds. Indeed Figure 4.15 point out that within Slovenia, direct subnational expenditure is lower than many OECD countries. As there are no regions in terms of administrative units in Slovenia, cooperation and general discussions (including on regional funding) with European institutions is carried out at the national level. Regions have low autonomy in the use of funds.

83. As a result, there are priorities and areas where stakeholders from the region cannot apply or access funds, etc. Regions stated their preference for faster refunds and advance payments to attract more micro beneficiaries, as well as for the local municipalities to implement more and larger projects such as the implementation of activities defined in the regional strategic documents.

Figure 4.15. Subnational government expenditure as a percentage of GDP and total public expenditure

Subnational expenditure as a share of total public expenditure (%)



Source: (OECD, 2018_[30])

Multilevel governance

84. Slovenia operates across levels of government from a project and application base and much less from a strategic one. In fact, the Regional Development Programmes (RDP) are the only development document prepared at the regional level. More broadly, co-operation is focused mainly on project co-operation. This causes a range of issues including:

- Many projects remain unrealised if not successfully applied to the call for proposals.
- The emphasis on municipalities means that too often they assert partial interests, resulting in poor recognition of other stakeholders in the processes, providing an unrealistic laundry list of proposals to the regional development agencies.
- Regional development agencies interacting with municipalities chiefly to point out which projects they can apply to and aiding with paperwork.
- National rural development program does not fully respond to the development needs of rural areas, and it is too linked to agricultural issues
- Lack of connection and knowledge sharing across the levels of government causes frustration due to limited understanding of the reasons for decision making and delays in outcomes.

85. In addition, there is not an established regional institutional level with a decision-making function. That is a structural deficiency which is often reflected in the lack of information at the regional level, in the ability of the region to respond promptly to proposals at the national level and in the preparation of appropriate regional measures and documents.

86. Finally, whilst there are competence centres that have been established, many state that they lack information. For example, within Podravje, there exist 30 local action groups, but they are not very well-

known. In addition, the regional actors point to the lack of people skills and limited time to manage the wide range of necessary activities such as the public agencies, permissions, funds, etc. The OECD proposes 10 guidelines to assist in the better division of responsibilities that can allow greater consideration of the development objectives of the regions.

Key takeaways: governance

- Formalised learning and set goals and timelines that allow for monitoring and evaluation do not occur in a systematic manner in all policy tools or strategies, particularly at the regional level where monitoring is primarily project linked.
- Direct subnational expenditure is lower in Slovenia than many OECD countries through lack of a formal regional layer. Providing non-financial support as well as financial from the national government may help tackle the dominant issue of gaps from unstable EU funding to regions.
- This limited “intermediate layer” leads to challenges including unrealised projects, difficulties balancing national with municipal concerns, and delays in decision making. More regular forms and different formats of communication and collaborative action across levels of government should be experimented with.

Box 4.6. Ten guidelines for effective assignment of responsibilities to make decentralisation work

Clarify the sector responsibilities assigned to different government levels: while inevitably most responsibilities are shared across levels of government, it is crucial to ensure adequate clarity and mutual understanding of the role of each level of government in the different policy areas to avoid duplication, waste, and loss of accountability.

Clarify the functions assigned to different government levels: equally important as the clarity in the assignment of policy areas, is the clarity in the different functions that are assigned such as financing, regulating, strategic planning, implementing, or monitoring.

Ensure balance in the way different responsibilities and functions are decentralised: balanced decentralisation, i.e., when the various policy functions are decentralised to a similar extent, is conducive to growth. Ensuring balance in the way various policy functions are decentralised is essential to allow for complementarities across policies and integrated policy packages for effective territorial development approaches.

Align responsibilities and revenues and enhance capacity of subnational governments to manage their resources: the allocation of resources should be matched to the assignment of responsibilities assigned to subnational governments (SNGs). SNGs should control a portion of subnational resources in order to promote their accountability.

Actively support subnational capacity-building from the central government, on the human, institutional and strategic dimensions of subnational governments. More responsibilities at the subnational level need to be complemented with the human resources capable of managing them, and too often this dimension is underestimated. Capacity development at the subnational level, particularly in poor or very small municipalities, must be actively supported with resources from the centre, and require long-term commitment.

Build adequate co-ordination mechanisms across levels of government: since most responsibilities are shared, it is crucial to establish governance mechanisms to manage those joint responsibilities. Such tools for vertical co-ordination include for example platforms of dialogue, fiscal councils, contractual arrangements, conditionalities, standing commissions and intergovernmental consultation boards.

Support cross-jurisdictional co-operation through specific organisational arrangements or financial incentives, to increase efficiency through economies of scale in investment or public service delivery.

Allow for asymmetric arrangements and pilot experiences: Allow the possibility for asymmetric decentralisation, in which differentiated sets of responsibilities are given to different types of regions/cities, based on population size, urban/rural classification or fiscal capacity criteria. Ensure flexibility in implementation, allowing for pilot experiences in specific places/regions – and permanent adjustments through learning-by-doing.

Effective decentralisation requires complementary reforms in the governance of land-use, citizen participation and innovative public service delivery and governance.

Enhance data collection and strengthen performance monitoring: monitoring and data collection need to be carried out to monitor the effectiveness of subnational public service delivery and investments. Monitoring systems need to be designed as a way to provide useful data for decision-making and peer-learning and with a limited number of indicators.

Source: (OECD, 2018^[30])

Annex A.

Table A A.1. Slovenian regions grouped as rural or otherwise

Categorisation in analysis

Region	Typology of access to cities	Rurality
Mura	NMR-M	Rural
Drava	MR-M	Not
Carinthia	NMR-R	Rural
Savinja	NMR-M	Rural
Central Sava	NMR-M	Rural
Lower Sava	NMR-M	Rural
Southeast Slovenia	NMR-M	Rural
Littoral–Inner Carniola	NMR-M	Rural
Central Slovenia	MR-M	Not
Upper Carniola	NMR-M	Rural
Goriska	NMR-S	Rural
Coastal-Karst	NMR-S	Rural

Source: OECD territorial grids

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