European Commission

European Innovation Scoreboard **2024** Country Profile **Slovenia**

Innovation

European Innovation Scoreboard 2024 – Country profile Slovenia

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European Innovation Scoreboard 2024 Country profile Slovenia

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Directorate-General for Research and Innovation
2024 Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs EN

SLOVENIA

Moderate Innovator

Summary innovation index (relative to EU in 2017): **100.1**

Rank: **17**

Change vs 2023: ▲ 1.5 Change vs 2017: ▲ 4.6

Slovenia is a Moderate Innovator with performance at 91% of the EU average in 2024. Performance is above the average of the Moderate Innovators (84.8%). Performance is increasing less than the EU (+10%).

Indicator	Performance relative to the EU in 2024	Performance change 2017-2024	Performance change 2023-2024
SUMMARY INNOVATION INDEX	**91.0**	**4.6**	**1.5**
Human resources	**113.8**	**-29.0**	**4.9**
New doctorate graduates	100.0	-69.5	11.6
Population with tertiary education	86.9	0.0	0.0
Population involved in lifelong learning	160.1	0.0	0.0
Attractive research systems	**102.0**	**37.3**	**-1.6**
International scientific co-publications	152.0	51.0	-5.7
Scientific publications among the top 10% most cited	76.4	10.1	-3.9
Foreign doctorate students as a % of all doctorate students	96.7	84.5	7.0
Digitalisation	**77.9**	**20.3**	**-1.2**
Broadband penetration	88.1	44.3	1.3
Individuals with above basic overall digital skills	63.8	-3.8	-3.8
Finance and support	**74.2**	**4.6**	**2.7**
R&D expenditure in the public sector	78.7	13.1	8.2
Venture capital expenditures	45.6	27.2	-1.6
Direct and indirect government support of business R&D	104.7	-33.8	-0.4
Firm investments	**59.5**	**-33.6**	**-5.9**
R&D expenditure in the business sector	100.0	-14.3	-6.0
Non-R&D innovation expenditures	27.2	-73.1	-6.7
Innovation expenditures per person employed	46.0	-12.6	-5.4
Use of information technologies	**103.5**	**-14.9**	**-1.6**
Enterprises providing ICT training	137.4	3.2	20.4
Employed ICT specialists	70.6	-32.3	-22.6
Innovators	**120.2**	**52.7**	**-1.5**
SMEs introducing product innovations	151.7	92.1	5.7
SMEs introducing business process innovations	94.6	15.3	-8.2
Linkages	**132.3**	**49.2**	**1.0**
Innovative SMEs collaborating with others	103.1	6.8	-4.9
Public-private co-publications	245.1	68.0	-29.8
Job-to-job mobility of HRST	110.4	76.5	20.6
Intellectual assets	**88.3**	**-10.3**	**6.1**
PCT patent applications	76.0	-23.8	5.7
Trademark applications	118.5	19.2	0.6
Design applications	74.5	-15.8	10.9
Employment impacts	**107.6**	**3.0**	**8.5**
Employment in knowledge-intensive activities	102.2	-21.7	-15.7
Employment in innovative enterprises	112.5	25.6	30.7
Sales impacts	**77.7**	**9.5**	**2.4**
Exports of medium and high technology products	106.9	19.2	10.9
Knowledge-intensive services exports	37.8	6.2	-5.4
Sales of new-to-market and new-to-firm innovations	93.9	-1.1	-0.1
Environmental sustainability	**79.9**	**13.6**	**2.3**
Resource productivity	88.1	28.3	1.5
Air emissions by fine particulates	93.3	14.6	3.6
Environment-related technologies	54.1	0.6	1.3

Emerging Innovators Moderate Innovators Strong Innovators Innovation Leaders

Relative strengths

- Public-private co-publications
- Population involved in lifelong learning
- International scientific co-publications

Relative weaknesses

- Non-R&D innovation expenditures
- Knowledge-intensive services exports
- Venture capital expenditures

Strong increases since 2017

- SMEs introducing product innovations
- Foreign doctorate students as a % of all doctorate students
- Job-to-job mobility of HRST

Strong decreases since 2017

- Non-R&D innovation expenditures
- New doctorate graduates
- Direct and indirect government support of business R&D

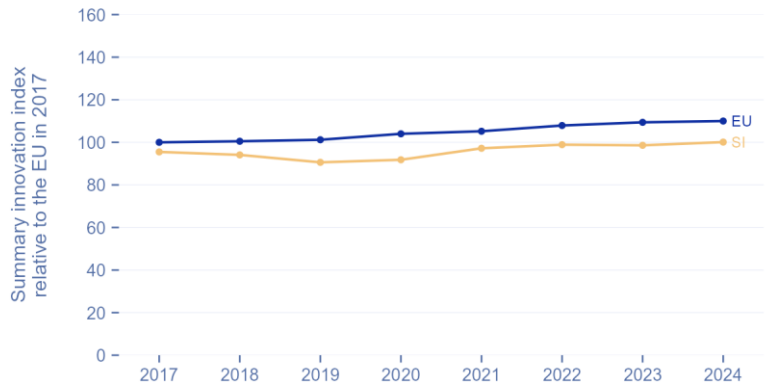
Strong increases since 2023

- Employment in innovative enterprises
- Job-to-job mobility of HRST
- Enterprises providing ICT training

Strong decreases since 2023

- Public-private co-publications
- Employed ICT specialists
- Employment in knowledge-intensive activities

Footnote: *The first data column shows scores relative to the EU in 2024, with colour codes indicating performance levels. The subsequent columns show performance changes over time, with scores relative to the EU in 2017, coloured in purple for positive change and red for negative change. As reference years differ between the first column (2024) and the last two columns (2017), scores cannot be directly compared or subtracted across these columns.*



Summary innovation index

The line chart shows the evolution of the innovation performance of Slovenia over time, relative to the performance of the EU in 2017.

Footnote: *All performance scores (SII and dimensions below) are relative to that of the EU in 2017.*

Framework conditions

Slovenia's higher education institutions attract more students from abroad every year, in particular foreign doctorate students whose participation compared to the EU average has increased by 84.5%-points between 2017 and 2024. However, this has not led to an increase in the number of new doctorate graduates in STEM, which is equal to the EU average and has been highly volatile in the recent years. Overall, the population with tertiary education is 40.7%, which represents 86.9% of the EU average in 2024.

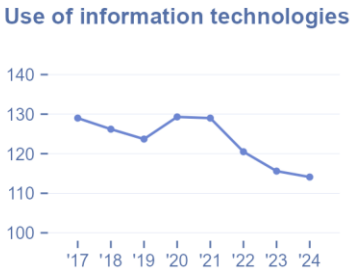
Slovenian research actors are very active in joint research with foreign research partners, as indicated by the high share of international scientific co-publications that surpasses the EU average, at 152.0%. Despite the research collaboration with other countries, Slovenian scientific publications in the top 10% most cited are below the EU average (76.4% of the EU average).

The digitalisation of the Slovenian economy follows the EU average progression and is highly driven by the progress in broadband penetration (+44.3%-points since 2017), with an increasing number of companies having quality Internet connections (55% of companies). However, the share of the Slovenian workforce with above basic digital skills remains low, at 63.8% of the EU average, and has marginally decreased over the recent years despite the important share of the population involved in lifelong learning (around 20% of population, or 160.1% of the EU average in 2024). The Slovenian Digital Skills & Jobs Coalition is a national initiative supported by the Digital Europe Programme that aims at addressing this issue and bridging the digital divide, in collaboration with industry and civil society stakeholders.

Investments

R&D spending by the public sector in Slovenia is low at 0.6% of GDP (78.7% of the EU average), but has recorded a positive growth (+13.1%-points) between 2017 and 2024. On the other hand, R&D expenditure in the business sector stood at 1.5% of GDP, the same as the EU average, and has experienced a strong decline since 2017 (-14.3%-points). Furthermore, firms' non-R&D innovation expenditures recorded a very strong drop of 73.1%-points and the lowest score Slovenia experiences. As a result of the reported struggles for firms (in particular SMEs) to fund innovation activities (OECD, 2024), firms' innovation expenditures per person employed (both R&D and non-R&D) are among the lowest in the EU, reaching less than half of the EU average. However, a positive trend is the growing venture capital expenditures, which, despite being half of the EU average, have grown steadily between 2017 and 2024 (+27.2%-points) and could provide additional financial support to business R&D in the next years.

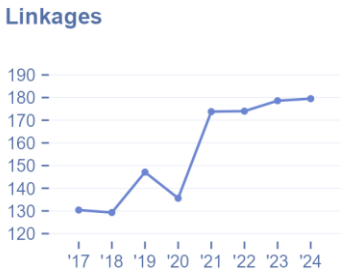
Slovenian companies heavily invest in their staff's skills. This is evident from the extensive provision of ICT training to their employees, which is above the EU average (137.4%). This is especially important in tackling the shortage of digital skills seen in the Slovenian population (as mentioned above).

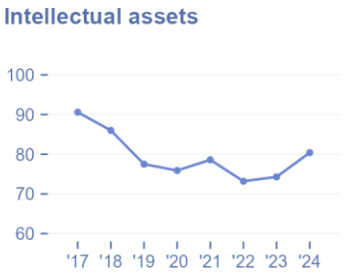


Innovation activities

Innovation activities in Slovenia are well-developed and above the EU average, except for the generation of intellectual assets, in which Slovenia lags behind, in particular PCT patent and design applications, which represent 74.6% and 76.0% of the EU average and have been decreasing over the years. On the other hand, Slovenia performs better than the EU in terms of trademark applications (118.5% of the EU average).

SMEs constitute most of the economic players in Slovenia and have been playing an important and growing role in Slovenian innovation activities since 2017, in particular by introducing more and more product innovations (+92.1%-points) and, to a lesser extent, more business process innovations (+15.3%-points). Innovative SMEs are also particularly active in collaborating with each other, just above the EU average. Slovenia is among the best EU performers in public-private co-publications, performing at 245.1% of the EU average in 2024, indicating a collaborative culture between the public and the business sectors in research, which is also aligned with the ambitions of Slovenia's industrial strategy (Government of the Republic of Slovenia, 2021). The labour market is dynamic, with a high performance in job-to-job mobility of employees in Science & Technology (110.4% of the EU average).

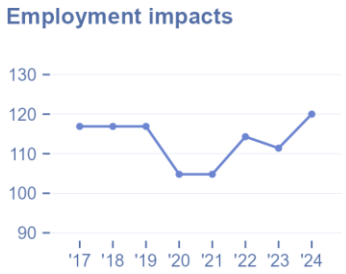


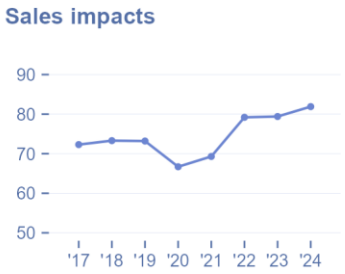


Impacts

The most visible impacts of Slovenia's innovation activities relate to employment, with an above-EU-average share of employment in innovative enterprises and in knowledge-intensive activities (although the latter has been decreasing in recent years with a drop of 21.7%-points between 2017 and 2024). An impact on sales is observed, with exports of medium and high technology products just above the EU average and increasing over years (+19.2%-points between 2017 and 2024). However, exports of knowledge-intensive services are lagging behind most EU countries, reaching only 37.8% of the EU average with limited progress over time.

Impacts on environmental sustainability are visible, especially on resource productivity and emissions of fine particles, which have both improved steadily in recent years (+28.3%-points and +14.6%-points respectively), and are just below the EU average. However, Slovenia lags behind in terms of the production of environment-related technologies (54.1% of the EU average), which, combined with the overall limited production of patents, indicates very low knowledge generation in this field.





Structural differences

Performance and structure of the economy

Slovenia's GDP per capita is just below the EU average (90.3% of the EU average GDP), and growing at 2.0% per year. Slovenia has a strong manufacturing sector representing 22.2% of employment, considerably more than the EU average, dominated by machine-building, metal, electrical, and chemical manufacturing. The service sector is smaller than the EU average and represents 37% of employment but is more oriented towards knowledge-intensive services relative to the EU. The employment share in high and medium high-tech is also slightly above the EU average.

Compared to the rest of the EU, Slovenian SMEs play a bigger role in the economy, capturing a larger share of total turnover (16.5%), and reducing the gap with the large enterprises, which capture 34.1% of total turnover compared to the 49.6% EU average. The share of value-added captured by foreign-controlled enterprises is 18.1%, above the EU average as expected for a small open economy.

Business and entrepreneurship

Entrepreneurship has been developing in Slovenia, with considerable entrepreneurial activity. However, this does not result in more enterprise births, where Slovenia stands below the EU average. The share of enterprises in the top 2500 R&D spending companies is very limited (4.8%). However, Slovenian businesses manage to attract significant FDI, with a net FDI inflow equal to 2.7% of GDP.

Innovation profiles

Data regarding innovation activities is not available for Slovenia. The main national actors to foster innovation in Slovenia are the Slovenian Research Agency (ARRS), the Public Agency for Entrepreneurship, Internationalisation, Foreign Investments and Technology (SPIRIT Slovenia), and national funds such as the Slovenian Enterprise Fund (SPS).

Governance and policy framework

Slovenia is a parliamentary democratic republic, led by a President directly elected. Corruption perception is moderate, with a score of 56.3/100 in the Corruption Perception Index, which reflects some weaknesses in the rule of law. Public procurement does not play a key role in supporting innovation, with low levels of procurement of advanced technology products and of innovation procurements.

Climate change

Slovenia's environmental context performs moderately, and more efforts are needed to surpass the EU average. Resource and energy efficiency are slightly lagging behind the EU, in particular in terms of greenhouse gas emissions, intensity of energy consumption and circular material use rate. Slovenia's score on the Eco-Innovation Index is also below the EU average.

Demography

Slovenia has a population of 2.1 million inhabitants, which makes it one of the smallest countries in the EU. Its population is growing at a slower rate (0.2%) than the EU average (0.3%). Although the country is mountainous and forested, it still has a population density of 104 inhabitants per km2, very close to the EU average.

Structural indicators

The table below presents some structural differences between Slovenia and the EU.

	SI	EU
Performance and structure of the economy		
GDP per capita	90.3	100
Average annual GDP growth (2021-2023 average)	2	1.9
Employment share Manufacturing	22.2	15.8
Employment share High and Medium high-tech	39.4	37.9
Employment share Services	36.7	39.8
Employment share Knowledge-intensive services	32.9	28.6
Turnover share SMEs	16.5	12.6
Turnover share large enterprises	34.1	49.6
Foreign-controlled enterprises – share of value added	18.1	13.3
Business and entrepreneurship		
Enterprise births	0.5	0.8
Total Entrepreneurial Activity	7.3	6.8
FDI net inflows	2.7	1.9
Top R&D spending enterprises	4.8	8.4
Buyer sophistication	3.3	3.6
Governance and policy frameworks		
Corruption Perceptions Index	56.3	64
Basic-school entrepreneurial education and training	2.9	2.6
Government procurement of advanced technology products	2.6	3.4
Rule of law	1	1
Innovation procurement as a share of total public procurement	5.8	9.2
Climate change		
Circular material use rate	9.8	11.5
Greenhouse gas emissions intensity of energy consumption	89.8	82.8
Eco-Innovation Index	115.9	121.5
Demography		
Population size (in millions)	2.1	447
Average annual population growth (2021-2023 average)	0.2	0.3
Population density	104.3	109

References

The country's relative strengths and weaknesses for each indicator, compared to other EU Member States and neighbouring countries, can be found in Annex B.

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This report provides the Country profile from the 2024 European Innovation Scoreboard for Slovenia

Studies and reports