European Skill Index 2024

In its most recent 2024 assessment the European Skills Index ranks Slovakia 19th out of 31 monitored European countries, and 16th among the EU-27. The overall unsatisfactory performance can largely be attributed to the insufficient inclusion of disadvantaged groups, both in education and in the labor market, as well as to the low economic activity of young people. One of the key limitations of the index is its failure to analyze existing skills beyond the scope of the labor market, particularly in the context of ongoing societal challenges. In Slovakia's case, the selection of indicators used to construct the index creates an impression of success in areas where the actual progress remains debatable. [1]

Skills policy is increasingly central to discussions on long-term sustainability and quality of life. Ongoing debates and the implementation of reforms aimed at improving educational outcomes in Slovakia must be viewed within the broader context of skills development and skills utilization. The volume, quality, and efficient use of human capital have now become undeniably key drivers of long-term sustainable economic growth and thus quality of life[2]. Inefficient public investments in human capital represent lost opportunities, and corrective measures require additional resources. In Slovakia, further progress in this area will necessitate stronger cross-sectoral cooperation, including the active involvement of relevant stakeholders.

A composite index for the area of skills has been developed following a similar approach used in other sectors[3]. Composite indices are commonly employed to track complex thematic areas. In Slovakia, well-known composite indices include the European Innovation Scoreboard (EIS) [4], used as a key outcome indicator in the field of research, development, and innovation; the Digital Economy and Society Index (DESI) [5] for digitalization; and the Better Life Index[6] for international comparisons of quality of life.

The European Skills Index (ESI) monitors the development and standing of countries in the area of skills. The index tracks three thematic pillars: development, activation, and skills matching using 15 indicators[7]. The selection of indicators captures the connection between skills acquisition within the education system (development), participation in the labor market (activation), and the employability of skills measured by the match between demand and supply in the labor market (matching). The importance of monitoring progress in this area is emphasized, among other things, by the European Skills Agenda for sustainable competitiveness, social fairness, and resilience adopted in 2020[8].

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[1] For valuable feedback we thank Juraj Cenker and David Martinák. Remaining shortcomings are solely responsibility of authors.

[2] Reform compass (IFP, 2022).

[3] European Skill Index.

[4] One of the key indicators in the National Strategy for Research, Development and Innovation 2030. EIS can be found here.

[5] Strategy and action plan for improving standing of Slovakia in DESI index until 2025. DESI can be found here.

[6] OECD Better Life Index.

[7] ESI has been created by CEDEFOP (European Centre for the Development of Vocational Training). Analysis of previous index publication in 2022 is available at Refernet.sk.

[8] European Skills Agenda for sustainable competitiveness, social fairness and resilience. Short version here. Agenda is largely focused on support of adult education and thus sets four main target indicators in this area.

Figure 1: European Skills Index (2024 edition)
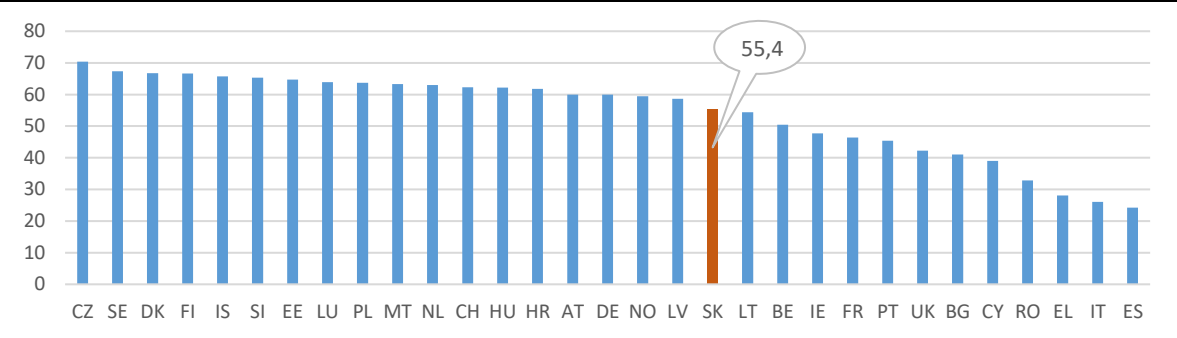
Source: ESI 2024

In the latest edition of the ESI, Slovakia ranked 16th among EU countries and 19th among 31 European countries. In addition to the 27 EU member states, the index also tracks four non-EU countries: Switzerland, Norway, Iceland, and the UK. The index value represents the average level achieved relative to the set targets; thus, the current score of 55.4 for Slovakia corresponds to an average attainment of 55.4% of the target levels established for individual indicators (see index methodology in the Box).

**Table 1: Pillars, sub-pillars and Indicators of the ESI**

Pillar	Area	Indicator
Skills Development	Basic education	Pre-primary pupil-to-teacher ratio
		Upper secondary education (and above)
		Reading, maths & science scores
	Training and other education	Recent training (adult education)
		VET students
		High digital skills
Skills Activation	Transition to work	Early leavers from training
		Recent graduates in employment
	Labour market participation	Activity rate (aged 25 – 54)
		Activity rate (aged 20 – 24)
Skills Matching	Skills utilisation	Long-term unemployment
		Underemployed part-time workers
	Skills mismatch	Overqualification rate (ISCED 5 – 8)
		Low waged workers (ISCED 5 – 8)
		Qualification mismatch

Source: ESI 2024

The Czech Republic achieved the best result, consistently maintaining this position since 2017. For Slovakia, the success of its neighbour is important to note, mainly due to a similar institutional structure of educational system. The Czech Republic has long recorded above-average labour market performance, which relates to the second and third monitored pillars. Although a detailed analysis of the reform measures, their implementation, and outcomes in skills agenda in the Czech Republic goes beyond the scope of presenting indicator results, the country's success can serve as an inspiration for Slovakia at multiple levels of the system.

Ranking of countries across the three pillars shows Slovakia's weakest performance in "Skills Activation". It is mainly due to unfavourable results in early school leaving and low labour market participation among young people aged 20–24. Conversely, Slovakia performs strongly in "Skills Matching," driven primarily by a relatively satisfactory result in qualification mismatch and a low share of involuntary part-time workers.

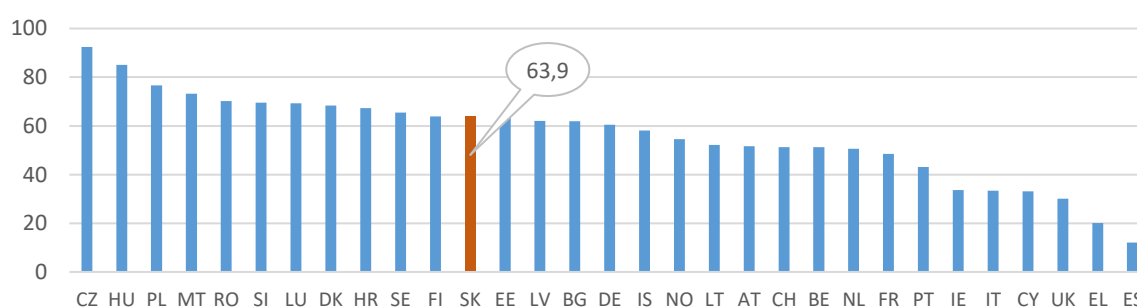**Figure 2: "Skills Development" Pillar**
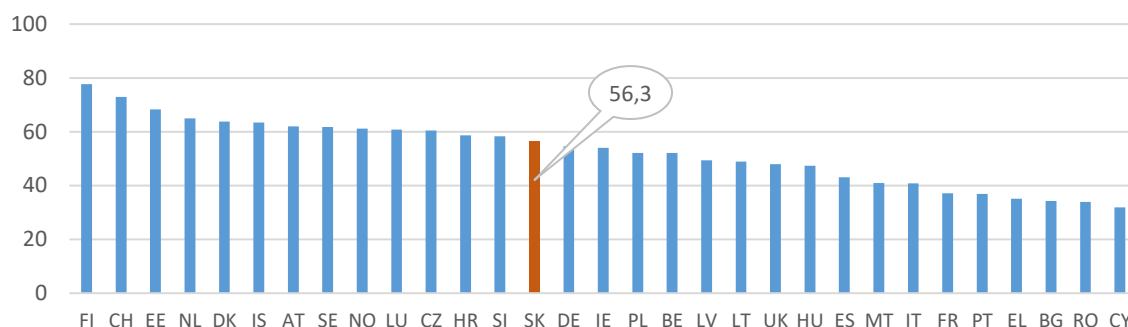
Source: ESI 2024

Figure 3: "Skills Activation" Pillar
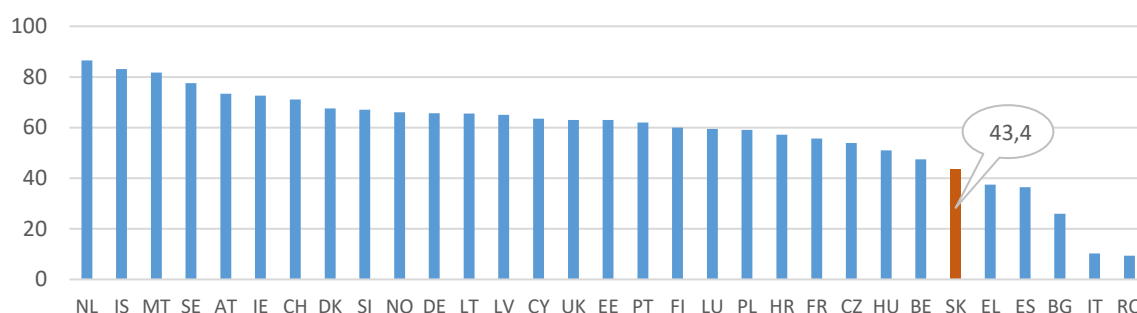
Source: ESI 2024

Figure 4: "Skills Matching" Pillar

Source: ESI 2024

Slovakia's overall index score is boosted by values of indicators with historical inertia, while PISA test results and labour market indicators drag it down. Strengths include the level of educational attainment measured by the share of the population with at least upper secondary education. High levels are common in post-communist countries due to past education policies. Another strong point is the low share of involuntary part-time workers, but this indicator has limited relevance given the overall low rate of part-time employment in Slovakia. Weak utilization of the existing workforce is

better reflected by other indicators, such as economic activity in demographic groups facing labour market entry barriers (mothers with children, students, retirees). This is evident in the low share of economically active population aged 20–24 and in persistent long-term unemployment (related to insufficient basic skills of some groups).

Excessive focus on vocational skills for the labour market neglects the need for future workforce mobility amid dynamic labour market changes. Slovakia's share of upper secondary students in vocational education and training (VET) is historically high, similar to the Czech Republic. At the same time, it is not clear if a higher VET share among upper secondary students is necessarily a positive outcome. This is because of the high specificity of skills acquired, which can limit future labour mobility, especially within a weak adult education system. The high share of jobs at risk from automation in Slovakia is likely to increase workforce mobility. This mobility is likely to be accelerated further by AI adoption, the shift to electromobility, and the like.

Figure 5: European Skills Index (2024), Indicator-Level Scores for Slovakia

Source: ESI 2024
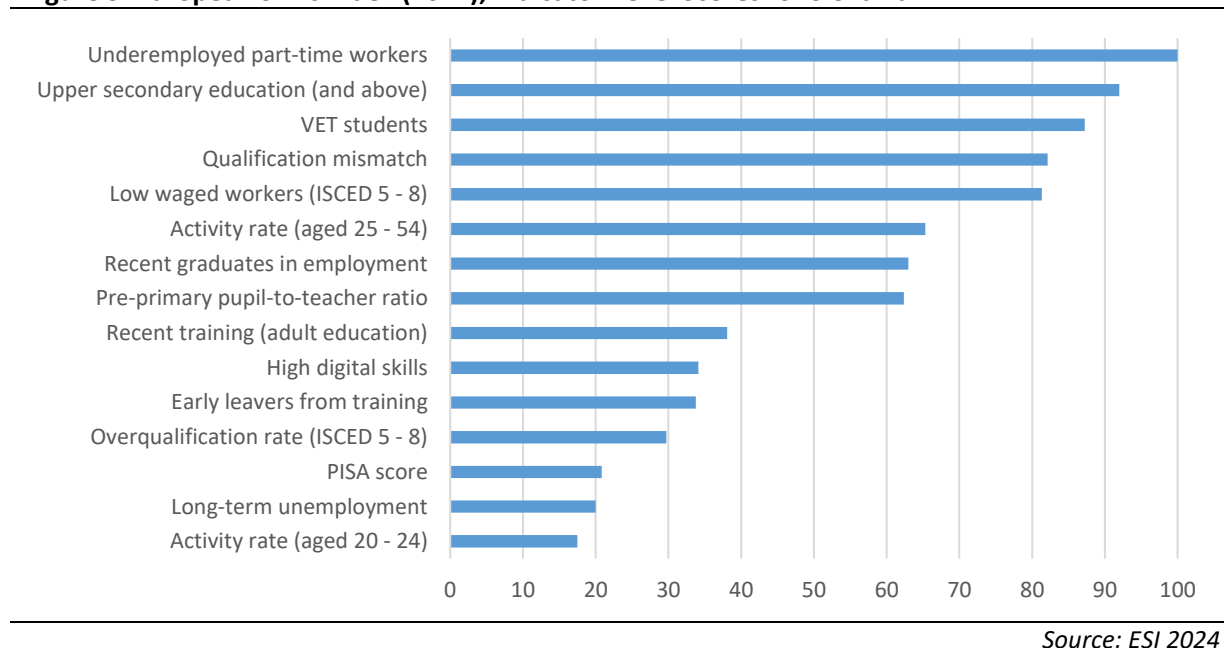
The usefulness of the composite Skills Index is debatable—its main value lies in the discussion it generates. The role of ESI in monitoring progress depends on the appropriateness of indicator selection, which in the case of the Skills Index is questionable, as noted earlier. The index also fails to adequately capture the complexity of 21st-century skill requirements, especially transferable and soft skills increasingly emphasized by employers. Those are, however, difficult to measure and even harder to capture with hard data. Furthermore, narrowing the skills debate exclusively to labour market utility overlooks the importance of skills for overall quality of life and individual participation in society. Social cohesion, trust in institutions, and active civic engagement are essential for sustaining democratic systems and building community resilience to climate change[9].

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[9] The topic of civic skills is also addressed by measure from Lifelong Learning and Guidance Strategy of Slovakia for 2021–2030. Civic education also includes topics such as environmental sustainability, preservation of cultural heritage, and various life literacies, including digital, media, and financial literacy, as well as hybrid threats and related areas.

Box: How is ESI constructed

Composite indices combine multiple sub-indicators into a single value to allow cross-country comparison in a given area. The normalized values of individual indicators are unit-free to allow aggregation. For ESI, normalization uses the standard min-max method, where the country's indicator value represents its position (percentage) within the range between the best (max) and worst (min) values. The best values correspond to the historical best result for an indicator during 2014–2020, regardless of which country achieved it, and should remain fixed in future calculations to ensure time comparability. Detailed values are provided in the accompanying documentation[10].

Unlike other composite indices, the ESI does not use the arithmetic mean of normalized values across individual indicators. Aggregation of normalized values is carried out in three steps. At the sub-area level, a weighted arithmetic mean is calculated, with weights determined by Principal Component Analysis (PCA). Next, at the area or sub-pillar level, another weighted arithmetic mean is computed, again using PCA-derived weights. In the final step, a weighted geometric mean is calculated across the three main pillars, with weights based on PCA. The geometric mean has the advantage of smaller compensation of low values by higher ones, thus penalizing weak results more strongly. Weight values are provided in the accompanying documentation[11].

The final index value, calculated in such a complex manner, is difficult to interpret. The use of PCA analysis, which in this case serves to determine weights for weighted averages, is technically demanding and difficult to communicate to the general public. For an average reader, this undermines trust in the results and hampers the popularization of the index. For this reason, our recommendation would be to recalculate the index using a simple unweighted average, even at the cost of losing statistical rigor. For constructing composite indices of this type, an unweighted arithmetic mean is sufficient. Similarly, other composite indices mentioned earlier in the text (EIS, DESI, Better Life Index) are calculated in this simple way.

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[10] Technical report from 2022 contains the threshold values for indicator normalization on page 20.
[11] Technical report from 2024, page 21.

Annex: Trends in Individual Indicators

This section examines trends in individual indicators. The rationale for this detailed view is the critique of index construction outlined in the box and the need for deeper understanding of the contribution of each indicator to the overall index. For comparison, we use the Czech Republic as a reference country due to its top ranking in the index and institutional similarity, as well as the EU-27 average. Where possible, updated data at the time of this publication are included for indicators. However, these updates are not reflected in the ESI 2024 index, which only incorporates data up to 2022 (or earlier, depending on data availability). It is also important to note that the EU-27 average used here is an unweighted average. An unweighted average is a better indicator of the impact of national policies across countries compared to a weighted average, where the EU mean is strongly influenced by countries with large populations (Germany, Italy, France).

Pillar "Skills Development"

The child-to-teacher ratio in pre-primary education is an indirect indicator of the quality of pre-primary education provision. Pre-primary education is widely recognized as an effective area for intervention to reduce educational disparities across socio-economic groups. Slovakia shows a strong dependence of educational outcomes on family background. To reduce this dependency, Slovakia introduced mandatory pre-primary education from age 5 in 2021 and plans, under the Recovery and Resilience Plan, to grant legal entitlement from age 3 starting September 2025. However, mandatory pre-primary education alone does not guarantee success; additional funding to supporting quality education will be crucial. Legislative changes are also planned to shift pre-primary schools funding from municipal budgets to the state budget, ensuring equal financing for all children. Compared to the EU average and the Czech Republic, Slovakia has a relatively low child-to-teacher ratio in pre-primary education.

The share of the population aged 15–64 with at least upper secondary education represents an indicator measuring the level of human capital. While this indicator reflects educational attainment, it does not capture the quality or employability of acquired skills. However, successful completion of secondary education enables further adult learning, such as qualification changes or upgrades. Like other post-communist countries, Slovakia has an above-average share of the population with at least upper secondary education.

Chart P1: Child-to-Teacher Ratio in Pre-primary Schools
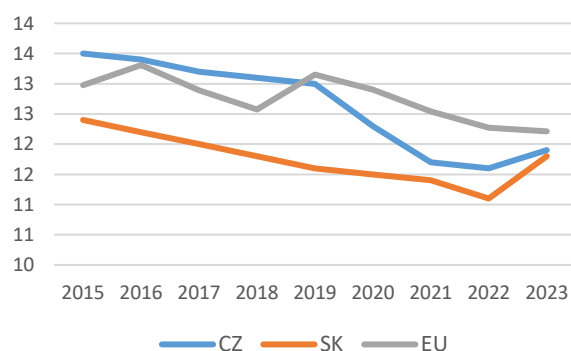
Source: Eurostat, educ_uoe_perp04

Chart P2: Share of Population with at Least Upper Secondary Education
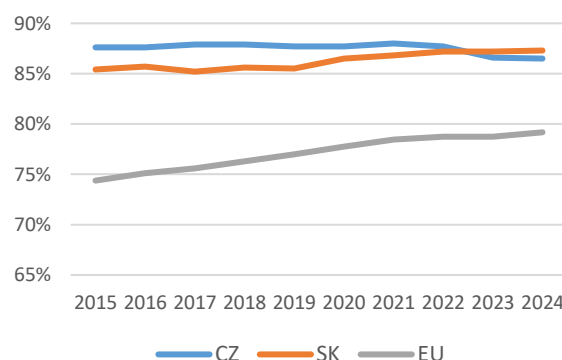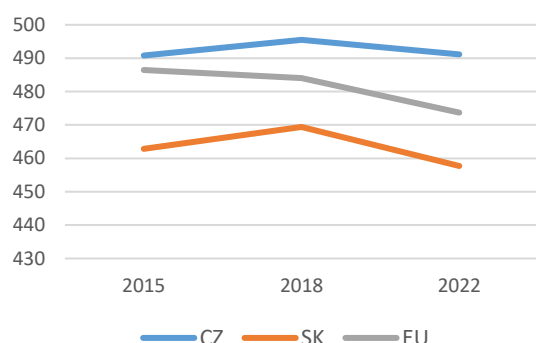

Source: Eurostat, edat_lfse_03

Reading, mathematical, and scientific literacy form the foundation for lifelong skills development. Without these skills, students are insufficiently prepared for further formal or informal education. Their social inclusion and active civic participation may be challenging. PISA testing is a standardized tool for cross-country comparison and tracking progress over time, enabling trend monitoring and evaluation of reform effectiveness. Slovakia consistently lags behind both the EU average and the Czech Republic.

Adult participation in education for ages 25–64 measures both updating existing skills and acquiring new ones. Adult education covers a broad range of activities beyond labour market needs. Its primary role is to enable skill supplementation after formal education amid rapid technological change and innovation, supporting job performance or career shifts. Equally important is its compensatory role for those lacking required skills from formal education. In 2021, a methodological change in Slovakia caused a significant improvement in this indicator, likely due to rephrased survey questions with expanded examples of educational activities[12].

Chart P3: Results in PISA Assessments

CZ — SK — EU

Chart P4: Participation in Adult Education

CZ — SK — EU
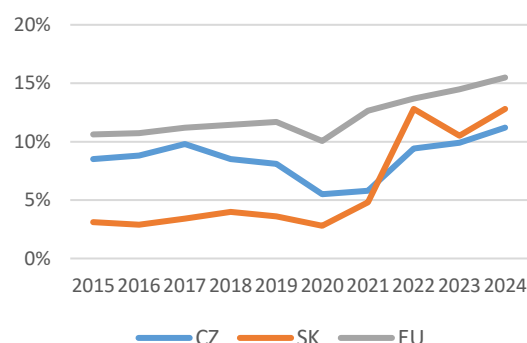
Source: OECD   *Source: Eurostat, trng_lfse_01*

The share of students in upper secondary vocational education measures the development of vocational skills during initial formal education. According to ESI, the main reason for including this indicator is the better labour market prospects for this group, especially in countries where work-based learning is a strong component, compared to students with the same educational level in general education. However, this comparison is questionable with widespread access to higher education. A high share of general education graduates continues their studies, mainly at universities. Similarly, a relatively high share of upper secondary vocational school graduates also pursues further education. Data from the latest administrative records show that one year after graduation, 85% of general school graduates continued their studies, while 48% of upper secondary vocational school graduates with a matura certificate did so (Graduate Employment - ISP). The current discussion on the importance of secondary vocational education focuses on the level of acquired technical and practical skills, as well as on graduates' soft and transferable skills. A higher level of transferable skills enables labour mobility

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[12] Survey question wording in 2020: „Have you participated in the last 4 weeks (ending last/reference week) in at least 1 hour of a course, training, tutoring, conference, or other form of education except preparation for a profession?". Survey question wording in 2021: „Have you participated in the last 4 weeks ending last week in at least 1 hour of a course (e.g., driving, language, hobby), seminar, meeting, training (including work-related, e.g., safety at work), conference, private lesson (tutoring), or other type of extracurricular education (University of the Third Age)?". Survey question wording in 2022: „Have you participated in the last 4 weeks in at least 1 hour of a course (e.g., driving, language, hobby, economic), seminar, meeting, training (including work-related, e.g., safety at work), conference, private lesson, tutoring, or other type of extracurricular education (University of the Third Age)?".
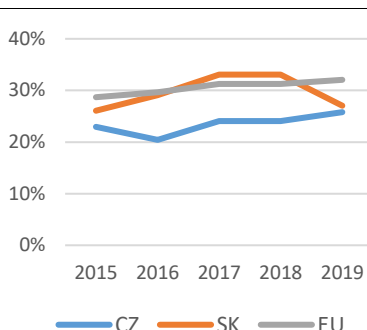
and more flexible qualification changes, which is an advantage amid rapid shifts in labour market demands.

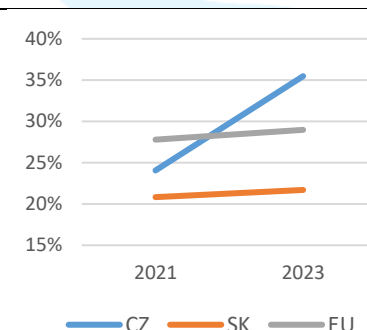| Graph P5: Share of Upper Secondary School Students in VET	Graph P6: Digital Skills up to 2019	Graph P7: Digital Skills from 2021
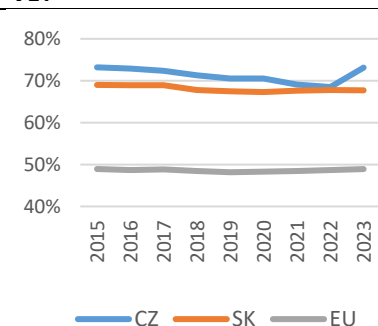
Source: Eurostat, educ_uoe_enra13 | *Source: Eurostat, isoc_sk_dskl_i* | *Source: Eurostat, isoc_sk_dskl_i21*

Digital skills are one of the most important skills of 21ˢᵗ century. Recovery and resilience plan emphasized and conditioned transfer of funds by investment in green and digital transformation. Component Digital Slovakia addresses the digitalization of public administration and public services to create demand for digital skills across the entire population. Since 2021, a new data collection methodology has been used, making the data incomparable over time. Although the European Pillar of Social Rights sets goals measuring progress for the share of the population with basic and higher digital skills, the EIS monitors the share of the population with more than basic skills. For comparison, results from data collection in 2021 and 2023 after the methodological change are also provided.

Pillar "Skills Activation"

Early school leaving is a key indicator capturing success of inclusive educational policies. It refers to young people aged 18-24 with at most EQF level 2 (lower secondary vocational education), who in the 4 weeks before the survey did not participate in any formal or non-formal education activity. This group includes those without completed elementary education, those with only elementary education, or graduates of so-called F field of study, whose completion does not allow further formal education. ESI further restricts this group to those not employed, to exclude workplace learning and focus solely on education system. Slovakia's situation is significantly worse compared to the EU average and the Czech Republic.

Graduate employment tracks the labour market integration of young people. The persons tracked are aged 20-34 who completed upper secondary or tertiary education 1 to 3 years prior and did not participate in formal or non-formal education in the 4 weeks before the survey. Slovakia and the Czech Republic have historically above-average employment rates for this group and in the latest data year align with the EU average.

Graph P8: Early School Leaving
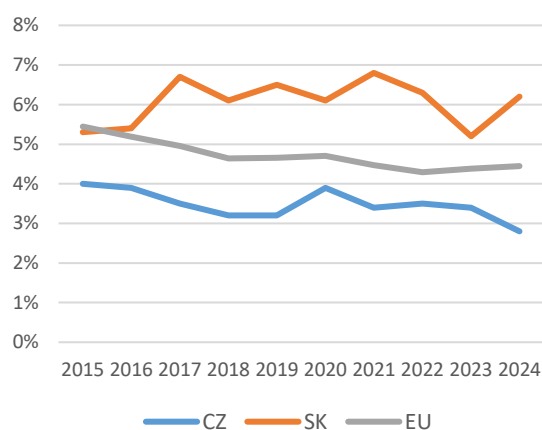
Graph P9: Graduate Employment
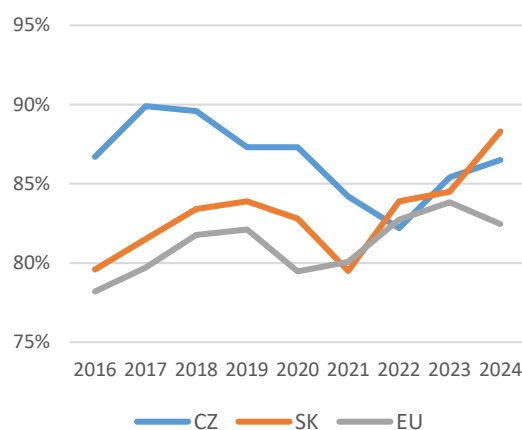
Economic activity by age group shows imbalance favouring older ages. Economically active includes employed and job seekers. After methodological adjustments in 2021[13] the economic activity rate for ages 25-54 reached above-average levels, similar to the Czech Republic. However, the 20-24 age group saw a sharper decline. Internationally, Slovakia shows low economic activity not only among 20-24-year-olds but also among mothers with young children and retirees[14]. Key reasons include low part-time employment rates and limited flexible work arrangements for these groups.

Graph P10: Economically Active Population Aged 25-54
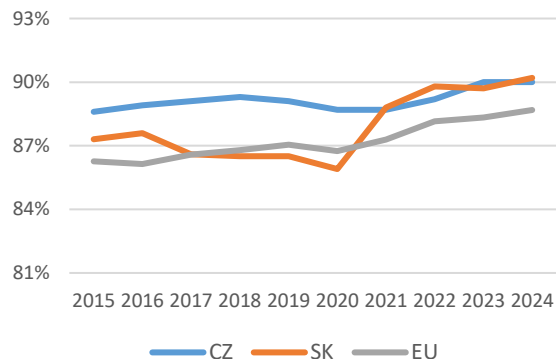
Graph P11: Economically Active Population Aged 20-24

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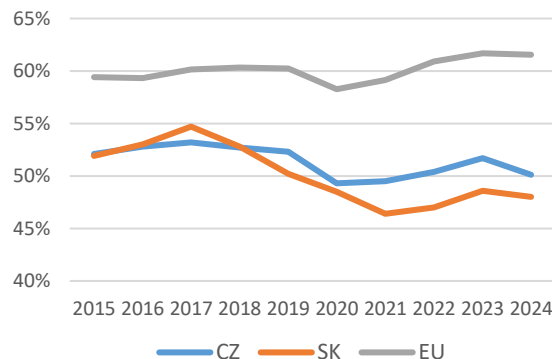
[13] The sharp increase in economic activity in the age group in 2021 was caused by a methodological adjustment (mainly the reclassification of parental leave from inactivity to activity).

[14] The low economic activity among young people was pointed out also in the document by the Institute of Financial Policy Reform compass.

Pillar "Skills Matching"

Long-term unemployment largely reflects low adaptability to labour market demand. It covers ages 15 to 74 and is calculated as a share of the labour force. Despite favourable post-pandemic labour market conditions and a declining unemployment trend, long-term unemployed remain a significant group in Slovakia. The discussion thus focuses on the low labour market integration of disadvantaged groups. Even though this group is fairly heterogeneous, systemic state interventions include addressing the lack of basic skills.

Part-time jobs can indicate underutilized human capital, but in Slovakia this applies only marginally. Part-time work offers flexible opportunities for those seeking to balance work with other life situations, such as mothers with children, students, or retirees. The involuntary part-time employment rate measures the share of people aged 15-74 who would prefer full-time work out of the economically active population. According to ESI data, this share is low in Slovakia—less than 0.5% as of 2022. Eurostat provides similar data (calculated as a share of part-time jobs, not total jobs). Slovakia's part-time employment rate is very low—4% in 2023, the third lowest in the EU, compared to the EU average of nearly 15%.

Graph P12: Long-term Unemployment

Graph P13: Involuntary Part-time Employment
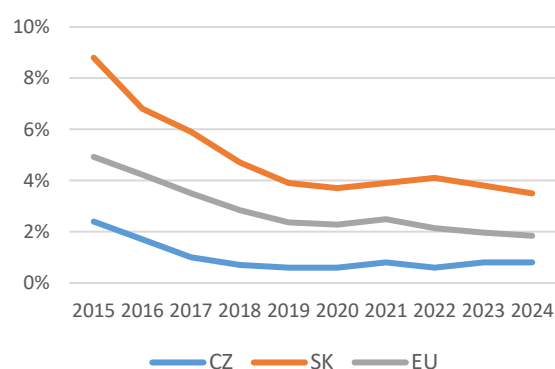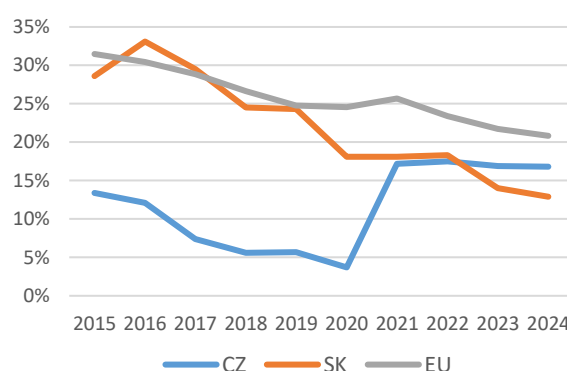

*Source: Eurostat, une_ltu_a*   *Source: Eurostat, lfsa_eppgai*

Overqualification reflects inefficient use of existing human capital. This indicator measures the share of employed young people aged 25-34 who have attained tertiary education (EQF levels 6-8) but work in positions not typical for this education level (ISCO groups 1-3: managers, specialists, technicians, and associate professionals). One of EU targets in education is to achieve a large share of highly educated young people, responding to technological progress and its impact on the labour market. However, overqualification may indicate a lag in transferring technological advances into practice and thus to labour market demands.

Graph P14: Overqualification of Higher Education Graduates
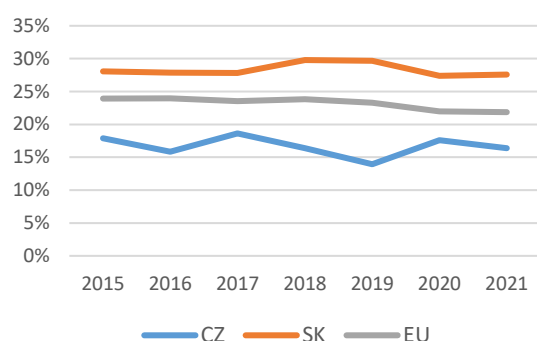
Graph P15: Low-paid Higher Education Graduates
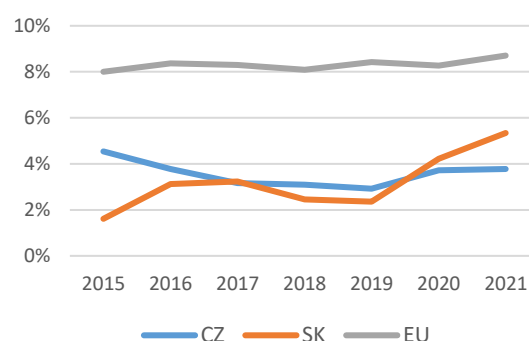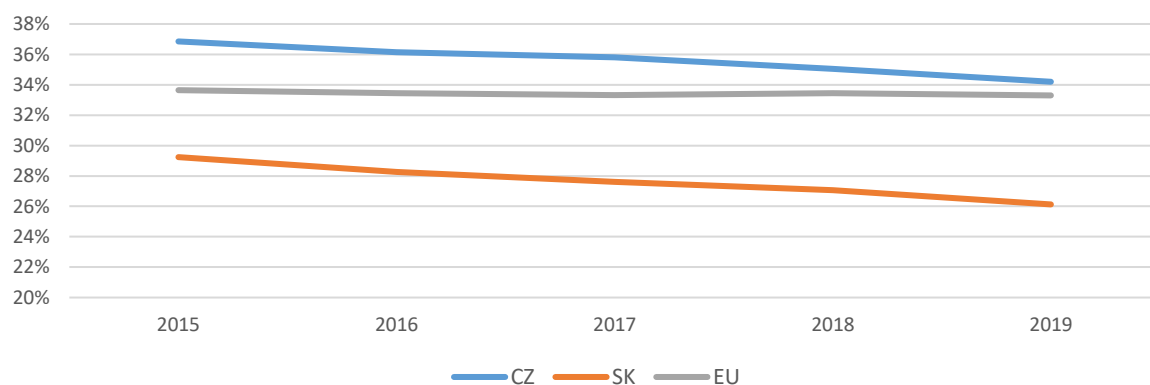

Source: ESI 2024

Source: ESI 2024

The indicator of higher education graduates with low wages reflects low returns on investment in education. Similar to the previous indicator, it measures inefficient use of human capital. It shows the share of highly educated workers earning less than two-thirds of the national hourly wage. Slovakia and the Czech Republic have a relatively low share of workers in this category compared to EU countries. The indicator includes all employed persons; differences between countries may also reflect structural factors, such as varying shares of demographic groups in low-paid, low-skill jobs (e.g., retirees).

Qualification mismatch captures not only overqualification, but also underqualification in occupations. It compares the educational level of individuals working in specific occupations with the modal education level for those occupations. When changes occur in educational requirements for certain jobs, this indicator may show higher values. Slovakia performs well on this indicator, despite a high qualification mismatch among tertiary-educated individuals. The values are calculated from microdata, but only up to the year 2019. In Slovakia, the discussion on skills mismatch tends to focus more on field-of-study mismatch, for which, however, there is no internationally harmonized methodology for measurement. We believe that both qualification and field-of-study mismatches will increasingly be overshadowed by the broader issue of skills mismatch, regardless of occupation. This is due to the emergence of multi-disciplinary job profiles and the need for reskilling in response to structural changes—such as the high share of jobs in Slovakia that are at risk of automation.

Graph P16: Qualification Mismatch

Source: ESI 2024