

# Spending Priorities for Successful Slovakia

## General Government Spending Review

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## **Note**

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## Table of Contents

Executive Summary.....	10
1. How is Slovakia different from the other EU countries?.....	12
1.1 Expenditures are at the lower end in the EU and the structure also differs.....	12
1.2 Outcomes: a large room for improvement.....	17
2 A closer look at the differences.....	20
2.1 Old age: higher expenditure, average outcomes.....	21
2.2 Social protection: comparable expenditure, different structure.....	27
2.3 Healthcare: spending commensurate to the country's wealth.....	38
2.4 Education: poor outcomes that correspond to low spending.....	41
2.5 Research and development: spending is low in both the public sector and the private sector.....	46
2.6 Public order: more than rich countries, especially on the police.....	53
2.7 Transport: more than the most developed countries, not only because of the lack of infrastructure....	56
2.8 General government salaries and wages: expenditures and numbers are comparable, the challenge is their structure.....	62
2.9 Capital investments: low and targeting mainly transport.....	66
3 What should be the priorities?.....	76
Annexes.....	78
Annex 1 Structure of public expenditures.....	78
Annex 2 Description of methodology.....	79
Annex 3 Selection of a suitable period.....	84
Annex 4 Sensitivity of the choice of reference groups.....	85
Annex 5 DEA methodology.....	86
Annex 6 Effect of expenditure adjustments.....	88
Annex 7 List of indicators and Slovakia's performance.....	89
Annex 8 Sensitivity of the choice of indicators.....	92
Annex 9 Expenditure per capita in PPP values.....	93
Annex 10 Results of regression models.....	95
Annex 11 Alternative DEA regression models.....	97
Annex 12 Investment gap by area and by target achievable by closing the gap.....	99
References.....	102

## List of Graphs

Graph 1: Development of public expenditures, % of GDP .....	13
Graph 2: Public expenditures (2011-2020 average), % of GDP.....	13
Graph 3: Trends of OECD countries in the Better Life Index ranking, How's Life? methodology 2020 .....	14
Graph 4: Structure of Slovakia's public expenditures according to COFOG (average 2011-2020), % of GDP .....	15
Graph 5: Deviations of adjusted expenditures from the reference groups (2011-2020 average), % of GDP.....	16
Graph 6: Proportions of the individual age groups in the total population .....	17
Graph 7: Deviations of Slovakia's composite indicators from the reference groups .....	18
Graph 8: Composite indicator for all general government* .....	19
Graph 9: Performance (2020*) and expenditure deviations (2011-2020), % of GDP.....	20
Graph 10: Total efficiency according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values) ..	21
Graph 11: Old age expenditures (COFOG breakdown) .....	22
Graph 12: Structure of old age expenditures according to ESA (average of 2011- 2020), % of GDP .....	23
Graph 13: Structure of old age expenditures according to ESA excluding benefits (average of 2011-2020), % of total old age expenditures .....	23
Graph 14: Ratio of public pension to average wage (benefit ratio), 2019, in % .....	23
Graph 15: Distribution of old-age pension recipient according to the pension amount in the Slovak Republic as of 12/2021 .	24
Graph 16: Expected number of years in retirement for retirement in 2020 .....	24
Graph 17: Average retirement age in 2020 (after an uninterrupted career since the 22nd year of age).....	24
Graph 18: Expected rate of replacement of earnings by a pension (replacement rate) for a pensioner born in 1998, in % ...	25
Graph 19: Comparison of performance and spending for the old age area (2011-2020) .....	26
Graph 20: Efficiency in the old age area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values).....	26
Graph 21: Social protection expenditures .....	27
Graph 22: Structure of social protection expenditures (average of 2011 - 2020).....	28
Graph 23: Examples of differences in the COFOG 10 (2020) expenditure reporting, % of GDP .....	29
Graph 24: Comparison of performance and spending for the social protection area (2011-2020) .....	30
Graph 25: Efficiency in the social protection area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values) .....	30
Graph 26: Comparison of sickness and disability expenditures, % of GDP .....	31
Graph 27: Comparison of the structure of expenditures in the sickness and disability area (average of 2011-2020), % of the total expenditures on this area .....	32
Graph 28: At-risk-of-poverty rate (2020), in %.....	32
Graph 29: At-risk-of-poverty rate for persons with disabilities before and after social transfers (2020), in %.....	32
Graph 30: Comparison of expenditures on family and children, % of GDP .....	33
Graph 31: Comparison of the structure of expenditures in the family and children area (average of 2011-2020), % of the total spending on the area.....	35
Graph 32: Employment of mothers by the youngest child's age (2019 or the most recent available), in % .....	35
Graph 33: Comparison of unemployment expenditures, % of GDP .....	35
Graph 34: Net wage replacement rate (%) and duration of unemployment support (in months, 2020) .....	36
Graph 35: Structure of expenditures in the unemployment area (average of 2011-2020), % of the total spending on the area .....	36
Graph 36: Employment rate (in %, for the population aged 20 - 64).....	36
Graph 37: Comparison of expenditures on housing and material need assistance, % of GDP .....	37
Graph 38: Net income of a recipient of the minimum income benefit* as a percentage of median income (non-working persons without children, 2020) .....	37
Graph 39: Healthcare expenditure, SHA methodology (adjusted for demographics), in % of GDP.....	38
Graph 40: Public spending on healthcare in proportion to GDP per capita (adjusted for demographics) .....	39
Graph 41: Relation between a county's wealth and expenditure on healthcare (2020) .....	40

Graph 42: Efficiency in the healthcare area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values).....	40
Graph 43: Healthcare expenditures, % of GDP .....	41
Graph 44: Age structure development forecast.....	41
Graph 45: Education expenditures, COFOG methodology .....	42
Graph 46: Comparison of expenditures on the different levels of education, % of GDP .....	43
Graph 47: Public to private education funding ratio (2019) .....	43
Graph 48: Public to private education funding ratio (2019), % of GDP .....	43
Graph 49: Breakdown of education expenditures into ESA categories (average of 2011 -2020), % of GDP .....	44
Graph 50: Structure of expenditures in the education area (average of 2011-2020), percentage of the total spending on the area .....	44
Graph 51: Comparison of performance and spending for the education area (2011-2020).....	45
Graph 52: Efficiency in the education area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values).....	46
Graph 53: Public expenditure on research and development (COFOG), % of GDP .....	47
Graph 54: Public expenditure on research and development (GBARD), % of GDP .....	47
Graph 55: Share of institutional and project funding in the budget (2020) .....	47
Graph 56: Total research and development expenditures, % of GDP .....	48
Graph 57: R&D expenditures in the public sector and the private sector (2020 ), % of GDP .....	48
Graph 58: R&D expenditures in the public sector and the private sector, % of GDP .....	48
Graph 59: R&D expenditures by type of research (2020) .....	49
Graph 60: Basic research by implementing sector (2020 ) .....	49
Graph 61: Structure of research and development expenditures by source of financing (average of 2012 - 2020) .....	49
Graph 62: Proportions of state budgeted expenditures provided to the business sector's R&D (2020), in % .....	49
Graph 63: Innovation score .....	50
Graph 64: Slovakia's ranking in the individual indicators* (2023), EU = 100% .....	51
Graph 65: Most cited publications, percentage of the EU average .....	51
Graph 66: Researchers per million of population .....	51
Graph 67: Comparison of performance and spending for the research and development area (2011-2020).....	52
Graph 68: Efficiency in the R&D area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values).....	52
Graph 69: Public order expenditures.....	53
Graph 70: Public order expenditures (average of 2011-2020), % of GDP .....	54
Graph 71: Public capital in public order, IMF methodology, % of GDP .....	54
Graph 72: Structure of Slovakia's public order expenditures according to COFOG (average of 2011-2020), % of GDP .....	54
Graph 73: Comparison of performance and spending for the public order area (2011-2020) .....	56
Graph 74: Public policy performance related to GDP per capita (2011-2020) .....	56
Graph 75: Public expenditures on transport, % of GDP .....	57
Graph 76: Transport expenditures according to the COFOG groups and the ESA classification (average of 2011-2020), % of GDP .....	57
Graph 77: Employees/track kilometres, state budget (2019) .....	58
Graph 78: Average number of passenger-kilometres per employee (in thousands, 2020) .....	58
Graph 79: Public expenditures on transport by mode (EUR billion) .....	59
Graph 80: Expenditures of selected organisations of the Ministry of Transport and Construction of the Slovak Republic after their inclusion in the general government sector (EUR million) .....	59
Graph 81: International comparison of transport performance and spending deviations (2011-2020) * .....	60
Graph 82: Efficiency in the transport area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values).....	61
Graph 83: Investments in transport by type, EUR billion .....	61
Graph 84: Public capital - transport, % of GDP .....	61
Graph 85: Motorway density, km per thousand of km <sup>2</sup> .....	62
Graph 86: Electrified tracks, in % .....	62
Graph 87: Public capital in transport and transport expenditures (average of 2010-2021), % of GDP .....	62

Graph 88: Public capital in transport and transport expenditures - right axis (average of 2010-2021), % of GDP .....	62
Graph 89: Development of the number of general government employees per 1,000 of population (average of 2011-2020) 63	63
Graph 90: Number of employees in the general government sector per 1,000 of population (2020) .....	63
Graph 91: Development of employee compensations in the GG sector (average of 2011-2020), % of GDP .....	64
Graph 92: Development of employee compensations in the GG sector (average of 2011-2020), % of public expenditure ....	64
Graph 93: Number of general government employees (2022), in thousand of employees .....	64
Graph 94: Deviations of Slovakia's spending from the reference groups - employee compensations (2011-2020), % of GDP .....	65
Graph 95: Deviations of Slovakia's spending from the reference groups - employee compensations (2011-2020), % of wage .....	65
Graph 96: Framework comparison of employment by profession with the EU 26 countries and the EU 2004 countries (2019, 2020) .....	65
Graph 97: Indicative international comparison of wages (2014-2016), difference percentages.....	65
Graph 98: Total investments in the economy as a share of GDP .....	67
Graph99: Average total investments in the economy, % of GDP.....	67
Graph 100: General government's gross fixed capital formation (public investments), % of GDP .....	68
Graph 101: General government's capital expenditure budget and absorption for all sources, EUR billion .....	68
Graph 102: Budget and use of general government investment expenditures by source, % of GDP .....	69
Graph 103: Deviations of Slovakia's capital expenditures (average of 2011– 2020) .....	70
Graph 104: Public capital value (2019), % of GDP .....	70
Graph 105: Development of the public capital value, % of GDP .....	70
Graph 106: Amount of public capital by COFOG area (2019), % of GDP .....	71
Graph 107: Value of fixed assets of general government and non-financial corporations (2020), % of GDP .....	72
Graph 108: Public capital (% of GDP) and investment expenditures of general government (average of 2011-2020, right axis), % of GDP .....	72
Graph 109: Fixed assets and investment expenditures of general government (average of 2011 – 2020, right axis), % of GDP .....	72
Graph 110: Comparison of public capital amount (2019) and performance (2020) .....	73
Graph 111: Public capital efficiency, DEA (inputs as percentage of GDP and as expenditure per capita in PPP values) .....	74
Graph 112: Return on the assessed investments for the years 2017-2021 with verifiable benefits (by area) .....	74
Graph 113: Proportions of the individual age groups in the total population .....	82
Graph 114: Comparison of health and healthcare spending amounts (average of 2011-2020), % of GDP .....	83
Graph 115: Slovakia's average expenditures (2011-2020) and five-year moving average outliers+, % of GDP .....	84
Graph 116: Deviation of Slovakia's expenditures and 5-year moving averages (2011-2020), % of GDP.....	84
Graph 117: Sensitivity of the deviation of Slovakia's expenditures from the reference groups (average of 2011-2020), % of GDP .....	85
Graph 118: Sensitivity of the deviation of Slovakia's performance from the reference groups by area (average of 2011-2020), % of GDP .....	85
Graph 119: CCR model frontier.....	87
Graph 120: BCC model frontier .....	87
Graph 121: Effect of expenditure adjustments by reference group (average of 2011-2020 average), % of GDP .....	88
Graph 122: Slovakia's performance according to composite indicators.....	91
Graph 123: Deviations of Slovakia's composite indicators from the reference groups .....	92
Graph 124: Public expenditures in EUR thousand per capita on PPP basis (average of 2011-2020).....	93
Graph 125: Expenditures on the areas in EUR millions per capita on PPP basis.....	93
Graph 126: Efficiency in education, public and private expenditures (inputs as percentage of GDP and as expenditure per capita in PPP values) .....	97
Graph 127: Efficiency in regional education (inputs as percentage of GDP and as expenditure per capita in PPP values)....	97
Graph 128: Efficiency in tertiary education (inputs as percentage of GDP and as expenditure per capita in PPP values) .....	97
Graph 129: Efficiency in R&D, GBARD public and private expenditures (inputs as percentage of GDP and as expenditure per capita in PPP values) .....	98

Graph 130: Efficiency in R&D, GERD public and private expenditures (inputs as percentage of GDP and as expenditure per capita in PPP values).....98

## List of Tables

Table 1: Expenditure adjustments.....	16
Table 2: Comparison of the individual indicators between the groups of selected countries (2020).....	26
Table 3: Composite indicators for the old age area: normalised deviations from the EU 27 average.....	26
Table 4: Comparison of indicators between the groups of selected countries (2020).....	29
Table 5: Composite indicators for the social protection area: normalised deviations from the EU 27 average.....	29
Table 6: Development of family support expenditures since 2018 (EUR million).....	34
Table 7: Comparison of indicators between the groups of selected countries (2020).....	39
Table 8: Composite indicators for healthcare.....	39
Table 9: Comparison of indicators between the groups of selected countries (2020 or the latest available).....	44
Table 10: Composite indicators for the education area: normalised deviations from the EU 27 average.....	45
Table 11: Overview of performance indicators for the R&D area (2020).....	50
Table 12: Composite indicator for research and development.....	50
Table 13: Overview of performance indicators for the R&D area (2020).....	55
Table 14: Composite indicators for the public order area: normalised deviations from the EU 27 average.....	55
Table 15: Comparison of indicators between the groups of selected countries (2020).....	59
Table 16: Composite indicators for transport.....	59
Table 17: Comparison of indicators between the groups of selected countries (2020).....	73
Table 18: Composite indicators for the public investment area: normalised deviations from the EU average.....	73
Table 19: Investment gap estimate summary.....	75
Table 20: Evaluation of the areas in comparison with the reference countries *.....	76
Table 21: Structure of public expenditure in Slovakia (average of 2011-2020).....	78
Table 22: Description of the COFOG categories used.....	80
Table 23: Expenditure adjustments.....	81
Table 24: Differences in expenditures between Slovakia and the EU 27 with the application of the different adjustment approaches.....	83
Table 25: Regression model outputs.....	95
Table 26: List of variables.....	96

# List of Boxes

- Box 1: Who should Slovakia be compared to ..... 13
- Box 2: How to break down expenditures in order to monitor their structure ..... 15
- Box 3: The expenditures are adjusted so as to be as comparable as possible. .... 16
- Box 4: Compilation of composite indicators..... 19
- Box 5: Spending efficiency using Data Envelopment Analysis (DEA) ..... 20
- Box 6: Unclear reporting of expenditures under the COFOG classification ..... 28
- Box 7: Services vs. benefits in social protection..... 30
- Box 8: There is a potential for operational savings in the railway companies..... 57
- Box 9: Absorption of investment allocations and sources of funding investments..... 68
- Box 10: It is not clear how much “property” Slovakia has: varied methodologies, varied results..... 71

## Executive Summary

**Public budgets are a mirror of political priorities.** In a representative democracy, they reflect the economic, social, and political demands of citizens, within the boundaries of what the state can afford. In an ideal world, however, policy decisions should be informed by data and analysis.

**Slovakia is set to face challenges that will tend to push expenditures up, while the room for a rise is limited.** The ageing of the population, climate change or the war in Ukraine and its consequences are already putting pressure on public spending. A big challenge is also the slow economic growth and lagging behind in the quality of life of Slovakia's inhabitants (*Reformný kompas* [Reform Compass], 2022). However, the long-term sustainability of public finances, which is the worst in the EU ([European Commission, 2023](#)), limits the margin for further increases in spending.

**Instead of increasing expenditures across the board, it is necessary to focus on several priorities.** Resources should be directed mainly to the areas that can generate the highest benefit and give an impetus to economic growth in the long run, and, at the same time, improve the population's quality of life. While there has been much talk about poor results, the spending structure has not changed and it is further preserved through frequent blanket spending measures.

**The review offers an analytical view of the structure of Slovakia's public spending and the results it delivers.** It compares Slovakia's spending relative to the size of the economy for the years 2011-2020 with the countries with the highest quality of life (Smarts), those with the most improving quality of life (Tigers) and those which joined the EU together with Slovakia (EU 2004). The review also endeavours to take account of the demographics and other factors that influence the amount of spending regardless of political decisions. The aim of the review is to identify the major areas in which to concentrate budget resources.

**Slovakia should invest more in education and research and development.** We are lagging not only in terms of the amount of funding, but there is also a large gap as regards the achieved outcomes. Yet these areas are potential engines of economic growth. More educated people not only work more efficiently, produce more and pay higher taxes, but also cost the state less in terms of social spending. Also, research and development are the key to a knowledge-based economy and their results, when transferred into practice, significantly increase productivity and, ultimately, the quality of life. A higher public spending has the potential to attract private resources into research and development.

**A country's healthcare expenditure usually grows along with its wealth and the ageing of its population.** Such development can also be expected in Slovakia, which will be one of the fastest ageing EU countries in the near future. Currently, healthcare spending roughly corresponds to the country's wealth and when adjusted for demographics, it is higher than in other similarly rich countries. In the future, however, we can expect an increase in expenditure on personnel (especially nurses), new innovative medicines, or on strengthening primary care. However, given the poor performance of the healthcare system, it will be important to focus on efficiency to ensure that higher spending delivers more value for more citizens.

**Expenditures related to old age, social protection, public order and transport seem to be sufficient.** The spending on the social sector (old age and social protection) appears to have been adequate, taking into account the age structure, and Slovakia has achieved above-average results for the money spent. However, after the recent increases (retirement pensions or family policy), these expenditures may be even higher than those of other comparable countries when related to the country's wealth and demographics. The expenditures on public order are comparable to our neighbouring countries but significantly higher than in the most developed countries. As the wealth grows, their amount as a share of the economy should gradually decrease. Investments in transport appear to be high, but after the completion of the ongoing major transport projects, they are supposed to decrease and thus create space for higher investments in other areas.

**Capital investments are low and poorly reflected in the quantity and quality of infrastructure.** Slovakia invests more than other comparable countries in transport (roads and railways) or public order (for example, police cars or IT systems), but less in education, research or healthcare. As regards the physical infrastructure (for example, the density of motorways), despite higher spending, we have not markedly approached the Smart countries or improved more than the Tigers. The problem is the low ability to use capital expenditure allocations: only a little more than half of planned funds are spent every year. In order to make their use more efficient, it is necessary to improve the preparation phase, which now lacks high-quality investment plans linked to the budget preparation process and prioritised and profitable projects. The project acquisition and implementation stage is also problematic.

**It would also be appropriate to prioritise within the individual areas.** For example, social spending in Slovakia is relatively generous in supporting the sick, persons with disabilities and families with children, but housing allowances and assistance to the unemployed and people in material need lag behind. As regards the form of spending, Slovakia pays a large part of support directly through benefits, while governments abroad seek, to a much greater extent, to deliver services to citizens, be they childcare facilities or job intermediation services for the unemployed. In education, the long-term consensus is that spending on pre-primary and primary education has the highest return, but these are the areas where Slovakia lags behind the most. This is also why increased spending should be directed to these areas as a priority. For research and development, it would be appropriate to increase the share of grant funding and research support in the private sector.

**Changes in the structure of spending can be implemented gradually, by slowing down the growth in some areas.** The fastest way would be to immediately reallocate resources from the sectors spending more generously to those that are underfunded. A politically and technically less onerous way is to schedule the changes over a longer period, especially by increasing spending at a rate slower than the GDP growth rate in lower-priority areas. This would make the impact of the changes on the affected groups less significant and allow better control of the efficiency of spending.

**Any increase in spending must be conditional on an efficiency improvement, and this needs to be achieved particularly by adopting reforms that deliver better outcomes for the money spent.** According to this review, the efficiency of Slovakia's spending is low, practically in all areas. The situation appears to be the worst in healthcare and transport; on the other hand, while efficiency in education and social areas is also lower, the lagging behind Europe is not so marked. In addition to increasing expenditures, it will be necessary to adopt systemic reforms to avoid achieving the same performance for more money.

## 1. How is Slovakia different from the other EU countries?

The review offers an analytical view of the structure of Slovakia's public expenditures and the outcomes they bring to society. It seeks to answer the question of what Slovakia's spending priorities should be to achieve the greatest possible social well-being.

The poor outcomes of public policies and the need to define priorities have already been reiterated in a number of studies: *Najlepší z možných svetov* [The Best of All Possible Worlds] (2016), *Tri výzvy slovenskej ekonomiky* [Three Challenges for the Slovak Economy] (2019), *Rozpočet 2.0* [Budget 2.0] (2019), *Reformný kompas* [Reform Compass] (2022), *National Reform Programme* (2023), or several sectoral spending reviews. While there has been much talk about poor results, a change in the spending structure to reflect the need for better performance in priority areas is still absent.

This review compares public spending and the achieved outcomes of Slovakia's policies with the best and most improving countries. The control group is represented by the countries that joined the EU together with Slovakia. The review focuses on all public expenditures and endeavours to identify what Slovakia does differently from the other, successful countries and what consequences this has. The review does not aim to propose reforms for the different areas, but to help to identify the major areas in which to concentrate budget resources. Previous analyses have always focused on only a part of the problem: either on a single sector or on the performance alone, without taking into account expenditure. This review looks at all public expenditures and the results achieved and seeks to identify where additional spending can bring the highest benefit.

### 1.1 Expenditures are at the lower end in the EU and the structure also differs

**Slovak public expenditures are lower than those of the countries with the highest quality of life (Smarts), but comparable to the countries that joined the EU with Slovakia. The largest part is expenditures related to old age, social protection and health. Compared to the countries with the highest quality of life and the most improving countries (Tigers), Slovakia spends significantly less public funds on education, the labour market and the economy, or research and development. On the contrary, more funds are directed to old age, transport and public order.**

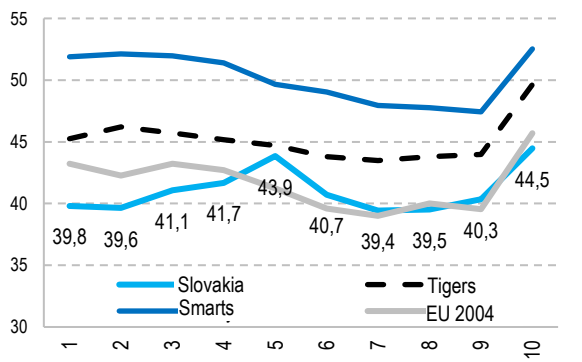
Public spending contributes significantly to the economic activity of every country. Governments use public expenditures to fulfil obligations and provide goods and services to the population. Their share in the total output reflects the level of involvement of the general government in the economy. It varies across countries. In the EU, it is the lowest in Ireland (33% of GDP)<sup>1</sup> and the highest in France (58% of GDP). For the USA, Japan and South Korea, it is 40%, 38% and nearly 32%, respectively. Although it may not always be the case, figures suggest that as countries become richer, their public sector also increases (Afonso, Schuknecht and Tanzi, 2023). This happens either because of the population's needs, such as those due to ageing, or as a result of political competition and the social agreement stemming from it.

The Slovak public sector is smaller than in the developed European countries, but comparable to the countries which joined the EU at the same time. Slovakia is compared to three groups of countries (Box 1): the EU countries with the best results in the Better Life Index<sup>2</sup> (Smarts), the countries with the most improved quality of life (Tigers) and the countries that joined the EU together with Slovakia in 2004 (EU 2004). Slovakia's public expenditures are lower than those of the Smart countries and the Tigers; they were about close to them only in 2015 as a result of the drawing down of remaining allocations from the EU funds.

<sup>1</sup> Ireland's GDP grew by 24% in 2015 because of large foreign investments by multinational IT corporations, but they are likely to be attracted mainly by Ireland's low taxation of profits. The real impact on the output of the economy is, therefore, questionable (Kostarakos, McQuinn and Varhalitis, 2023).

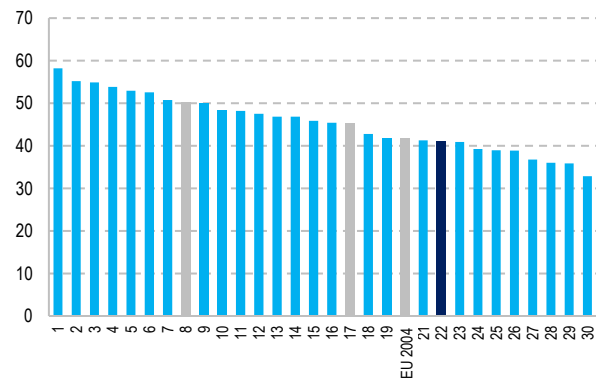
<sup>2</sup>The Better Life Index is a tool developed by the OECD that serves to evaluate and compare the standard of living and the quality of life across different countries. It includes a wide range of factors that affect the quality of life such as healthcare, education, employment, environment, housing, social involvement etc.

**Graph 1: Development of public expenditures, % of GDP<sup>3</sup>**



Source: VfMU's elaboration based on Eurostat data

**Graph 2: Public expenditures (2011-2020 average), % of GDP**



Source: VfMU's elaboration based on Eurostat data

### Box 1: Who should Slovakia be compared to

For the purposes of international benchmarking, Slovakia is compared to three groups of countries in this review: the EU countries with the best results in the [Better Life Index](#) (*Smarts*), the countries with the most improved quality of life (*Tigers*) and the countries that joined the EU together with Slovakia in 2004 (*EU 2004*). For expenditures, 10-year averages are compared. The examined period is the years 2011 to 2020. For performance, the review focuses on the year 2020 or uses the latest available data.

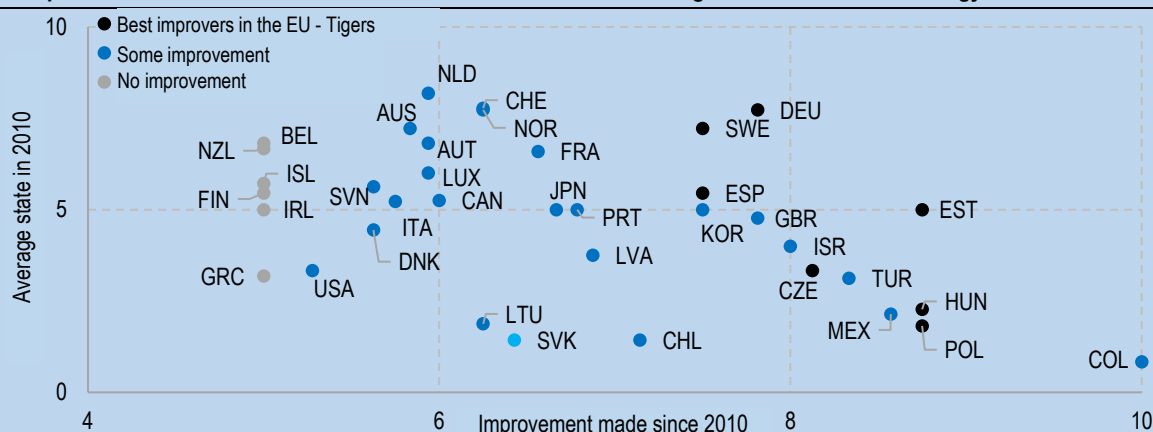
The main reference group is the **Smart** countries which represent the target quality of life. The group includes nine of the first ten EU countries in the [Better Life Index](#) ranking. These are Belgium, Denmark, Finland, France, the Netherlands, Ireland, Germany, Austria and Sweden. Luxembourg is not included among the Smart countries, i.e. those with the highest quality of life in the EU, because it differs significantly in socioeconomic indicators.

The group of **Tigers** includes the EU countries which, according to [How's Life? 2020](#) survey, have most improved the quality of life of their citizens since 2010 in the Better Life Index ranking. The group of Tigers includes the Czech Republic, Estonia, Hungary, Germany, Poland, Spain and Sweden.

The group of countries that joined the EU together with Slovakia (**EU 2004**: Cyprus, Czech Republic, Estonia, Lithuania, Latvia, Hungary, Malta, Poland and Slovenia) is used in comparisons as a benchmark of countries that had approximately the same starting position when joining the EU.

<sup>3</sup>COFOG health expenditures are replaced throughout the study by the OECD System of Health Accounts (SHA) expenditures for the reason of problems with duplicate inclusion of some expenditures; see Box 2.

**Graph 3: Trends of OECD countries in the Better Life Index ranking, How's Life? methodology 2020**



Source: [How's Life? 2020](#)

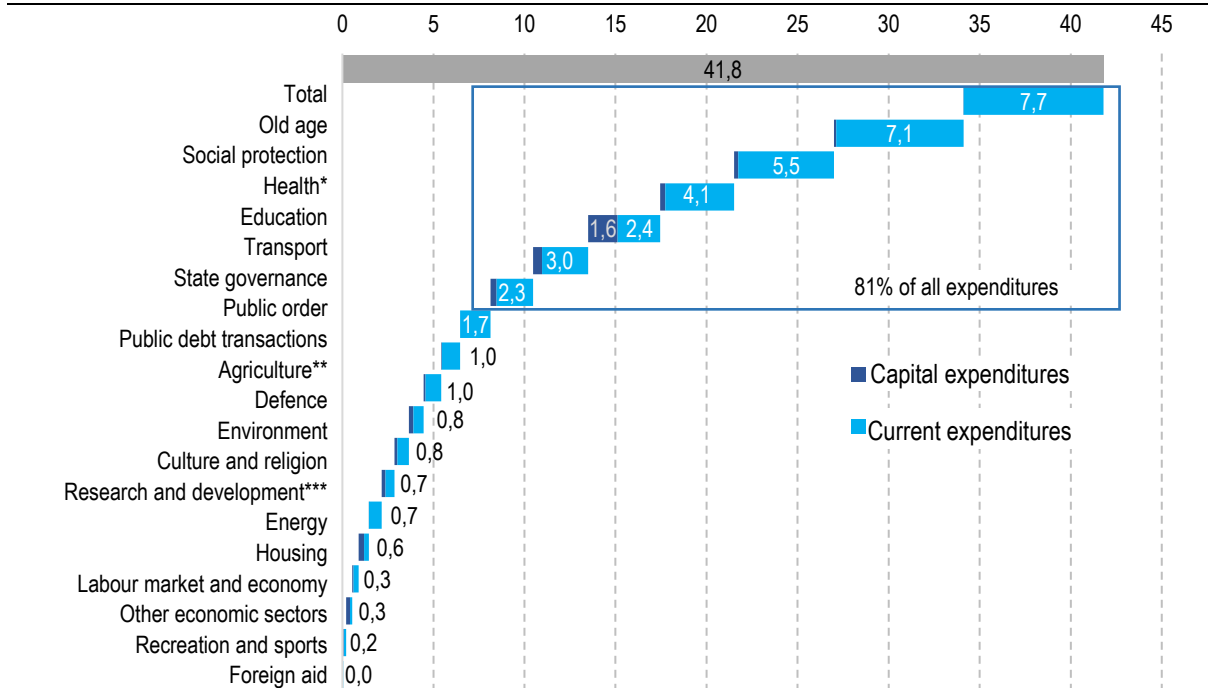
**The amount, structure or outcomes of spending of the Smarts and Tigers may not be optimal for determining the targets in the different areas.** For example, not all Smart countries are among the world's leaders in research and development expenditures and performance; and more suitable reference countries could be found in other areas, too. The choice of the three reference groups represents a compromise between a consistent approach throughout the review and an analytically ideal sample for each area. An analysis of the sensitivity of the Smarts and the Tigers to country selection is provided in Annex 4 Sensitivity of the choice of reference groups.

**The international comparison of expenditures is complicated by differences in national methodologies.** Not all EU countries approach the inclusion of entities in the public sector in the same way. For Austria, the motorway management company is not included and there may also be differences in hospitals. Countries also differ in how they employ partnerships with the private sector (PPP projects), which influences the ratio between their own investments and the purchase of goods and services. The public expenditures do not include funds from the European budget that are not channelled to the general government sector, a large portion of which is support for farmers (Box 3).

**The structure of public expenditures reflects the economic, social and political preferences of citizens.** While its effect on economic growth is discussed in the scientific literature ([Gemmell, Kneller and Sanz, 2016](#), [Martins and Veiga, 2014](#)), it is not the only goal of public policies ([Tridimas, 2001](#), [Alesina, Baqir and Easterly, 1999](#)). The structure of expenditures is the result of socioeconomic factors and previous political decisions. In a democracy built on the competition of political programmes, it should reflect the preferences of voters.

**In Slovakia, most public funds are spent on expenditures related to old age, social protection and health.** As many as 82% of all resources are spent on the seven major areas. More than a third of the total capital expenditures of the general government goes to transport (1.6% of GDP out of 4.4% of GDP), such as the construction of motorways, science and research parks and hospitals and the purchase of IT systems. To get a complete picture of the total funds in each area, tax expenditures (tax exemptions) for research and development and European funds supporting agriculture are added to the expenditures.

**Graph 4: Structure of Slovakia's public expenditures according to COFOG (average of 2011-2020), % of GDP**



\* COFOG expenditures replaced by SHA, \*\* increased by payments from the EU funds  
 \*\*\* Increased by tax expenditures.

Source: VřIMU's elaboration based on Eurostat data

**Box 2: How to break down expenditures to monitor their structure**

The expenditures of the general government sector (S.13) are divided into groups according to the [ESA 2010](#) classification and into areas according to the [COFOG](#) functional classification. ESA 2010 allows breaking down expenditures according to their economic purpose (for example, employee compensations, intermediate consumption or investments).

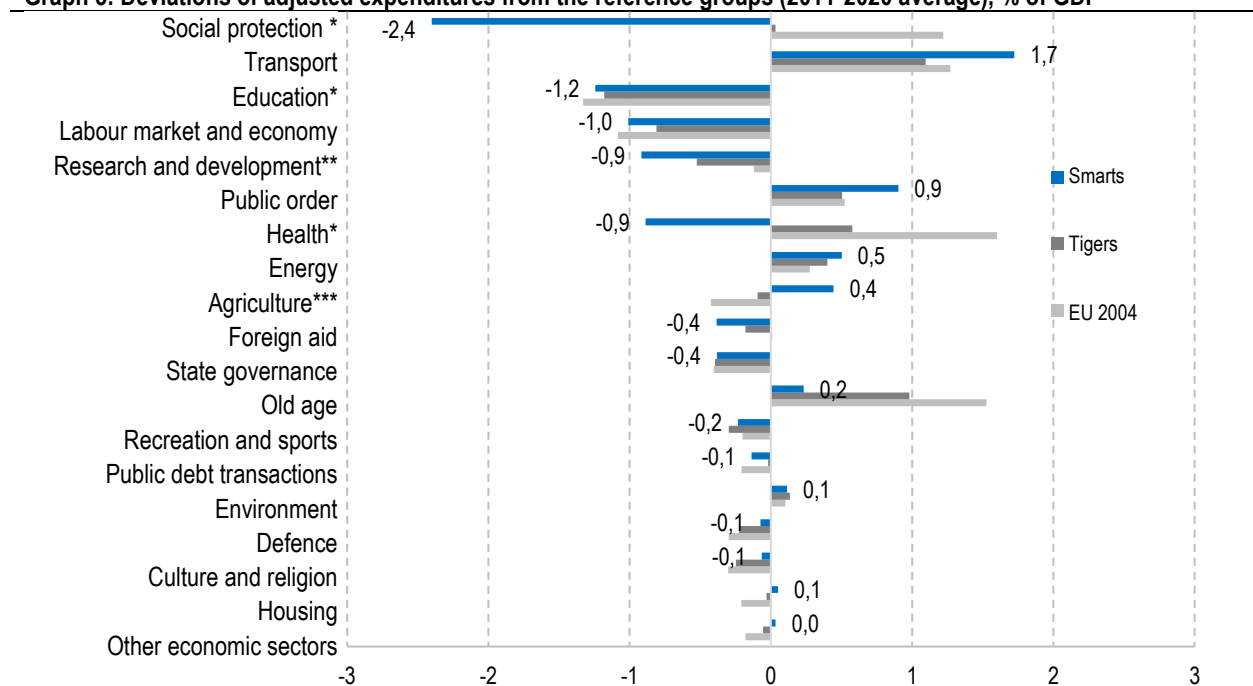
**For a better understanding of what the individual areas represent and to link them to results, the review examines 19 areas.** The COFOG functional classification divides expenditures into 10 areas (such as defence, social security or education) and 69 sub-areas, such as military or civil defence and primary, secondary or tertiary education. As a convention, only the main categories are presented. Some are further broken down into sub-categories in the review; for example, the economic area is divided into transport, energy and agriculture. Expenditures on applied research were extracted from the individual areas and merged with expenditures on basic research into a separate category of research and development. A detailed description of the categories is given in Annex 2.

**Health expenditures are replaced by expenditures according to the OECD System of Health Accounts (SHA).** COFOG health expenditures were artificially increased in the past through the duplicate inclusion of certain healthcare expenditures. Eurostat fixed the error in 2020 and revised the data, but only by 2017 and older data, thus remaining overvalued. However, SHA does not allow the division of spending according to the ESA categories. The recalculation of SHA expenditures into ESA categories was made using the COFOG health structure and the amount resulting from the difference between COFOG and SHA was deducted from social benefits, as they were previously increased through the duplicate inclusion.

**Compared to the EU countries with the highest quality of life (Smarts) and the most improving EU countries (Tigers), Slovakia spends significantly less on education, research and development and more on expenditures related to old age and, also, on transport and public order. Compared to the Smart countries,**

we spend less on social protection and healthcare, i.e. the areas where spending traditionally grows with the country's wealth. After 2021, several structural changes took place in Slovakia (Family Package, changes in pensions, salary increases in the health sector), which may reduce the gaps compared to the reference groups, but their impact is out of the scope of this analysis. In order to make the best possible comparison, expenditures are adjusted for the effect of demographics in the areas of old age, social protection, health and education.

**Graph 5: Deviations of adjusted expenditures from the reference groups (2011-2020 average), % of GDP**



\* Adjusted for differences in the age structure of the population; \*\* adjusted for tax expenditures; \*\*\* adjusted for direct payments from the EAGF. The figures reflect the difference to the Smarts.

Source: VIMU's elaboration based on Eurostat data

### Box 3: The expenditures are adjusted so as to be as comparable as possible.

For some areas, the expenditures are adjusted by factors that have a fundamental influence on their amount and can be reflected relatively easily. Expenditures not only depend on political decisions, but are often influenced by immutable factors as well. One example is the share of the population at retirement age and its impact on the amount of old-age pensions. For some areas, Eurostat does not consider all funds as public expenditures; these are, for example, tax expenditures in research and development or European funds disbursed outside the general government sector, especially in agriculture, and they are thus not included in the expenditures. The expenditures of some areas are thus adjusted accordingly (Table 1).

**Table 1: Expenditure adjustments**

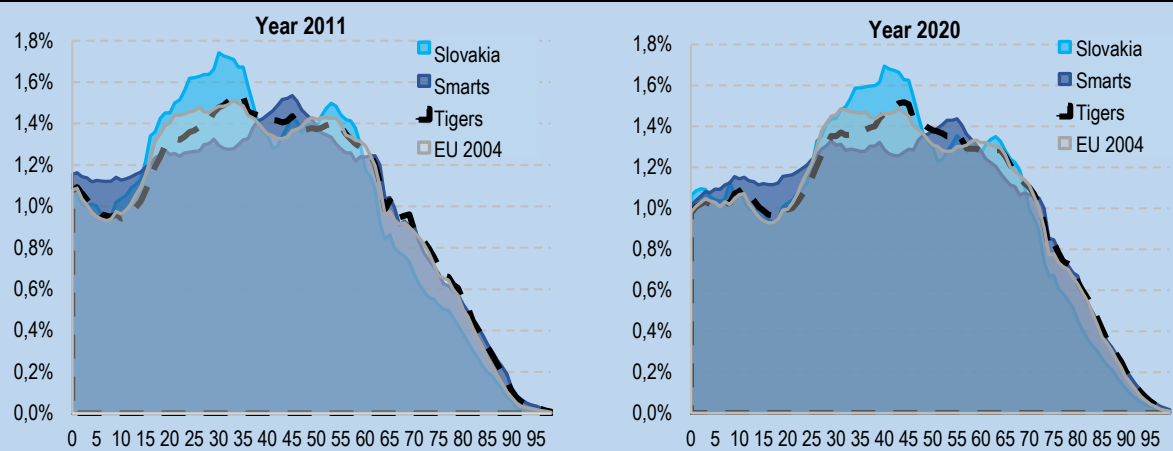
Area	Adjustment	Area of adjustment
Science and research	Inclusion of tax expenditures supporting science and research	All sub-areas of applied research and basic research (GF0104)
Agriculture	Inclusion of European funds from agricultural support mechanisms	Agriculture (GF0402)
Health	Replacement of COFOG data with SHA data	All Health (GF07).
	For the share of the population aged 65+.	All Health under SHA
Education	For the share of the population aged 3-25	All Education (GF09)
	Pre-primary and primary	Pre-primary and primary (GF0901)
	Secondary	Secondary (GF0902)
	Tertiary	Tertiary (GF0904).

Social protection	For the share of the population aged 65+ and 0-17	Sickness and disability (GF1001) and family and children (GF1004).
Old age	For the share of the population aged 65+	Old age (GF1002)

**Demographics have the most fundamental impact on spending.**

**Slovakia has a different demographic structure than the countries in the compared groups, which affects the amount of expenditure in some areas.** Compared to the Smart countries, the proportions of the youngest and oldest age groups in the total population are lower, while the proportion of the working-age population is relatively higher. Due to the different demographics, it is necessary to adjust the expenditures on education or family and children to reflect the size of the group of young people, and the expenditures on old age, sickness and disability or healthcare for the share of higher age categories. The expenditures of other countries are recalculated on the same basis as if they had the same age structure as Slovakia.

**Graph 6: Proportions of the individual age groups in the total population**



Source: Eurostat

But it is also possible to approach the adjustment in a more complex way and consider several factors at the same time using regression analysis. The results of such an approach confirm the importance of demographics. A full methodological description of the review, including a comparison of various expenditure adjustments, is provided in Annex 2.

**1.2 Outcomes: a large room for improvement**

**For most of the measurable outcomes, Slovakia lags behind the countries with the highest quality of life (Smarts) and those with the highest rate of improvement (Tigers). The worst is the situation in the public order, research and development, and healthcare. We achieve better results than the Smart countries only in social protection as the only area in which we surpass all reference groups of countries. Compared to the Tigers, Slovakia is significantly better only in transport and in the old age area.**

**Performance indicators can be used to assess how the state achieves outcomes for the public funds spent.** The main goal of public policies should be to improve the quality of life. An objective assessment of this for a given country or its specific sector is made by means of measurable indicators. Of course, not everything can be quantified and in some cases a complex environment cannot be described by mere figures. However, public discussion should be based not only on subjective opinions and personal experiences, but above all on objective data.

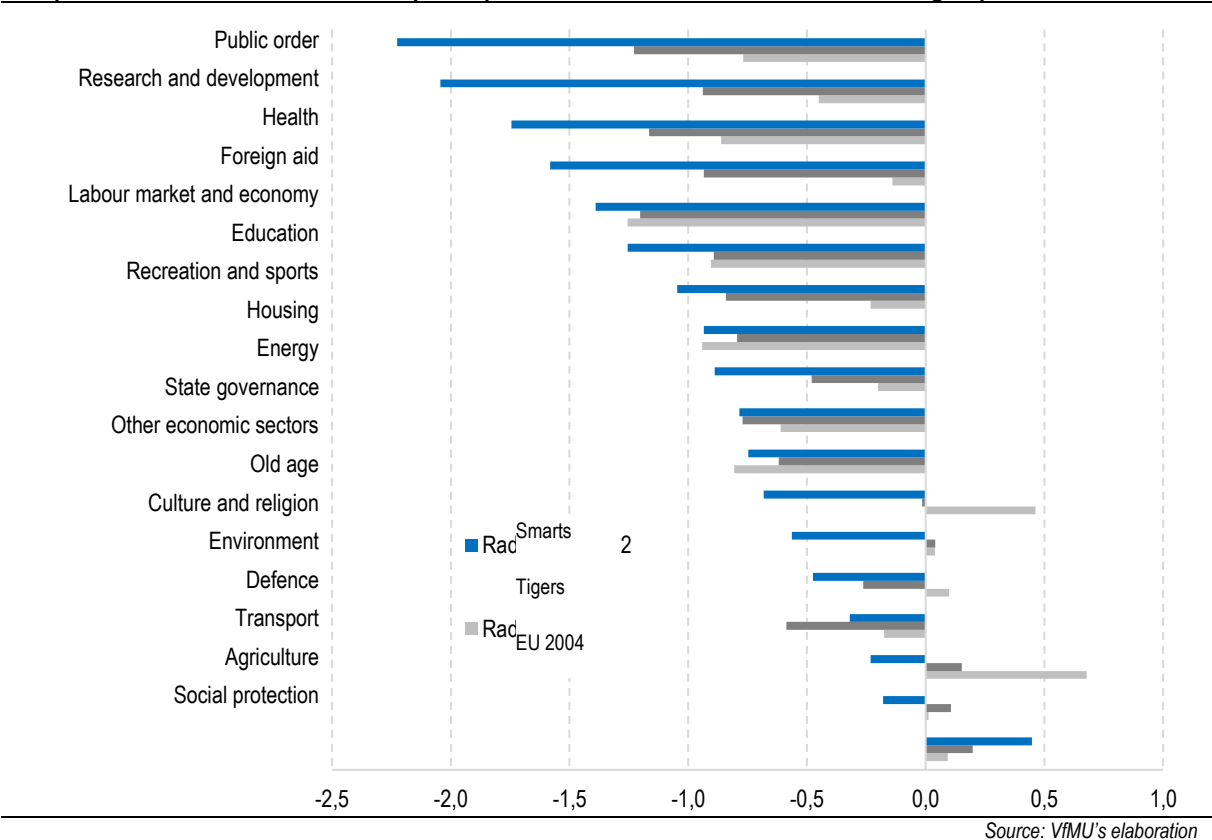
**The areas where Slovakia lags behind most are public order, research and development, and healthcare.** Compared to the other EU countries, Slovakia's outcomes are also significantly worse when it comes to labour market policies and the economy, education and housing. The Smart countries are better in all areas except social protection. The differences against the Tigers are somewhat smaller and there are more areas in which Slovakia

is better, most notably the transport and old age areas. Social protection is the only area where we outperform all three reference groups.

**The performance indicators in the review are mostly taken from the general government budget and additional indicators are used only sporadically.** The general government budget indicators are approved by the Government of the Slovak Republic and the specific Ministries responsible for the relevant areas, so there is a considerable degree of political and expert consensus on the indicators. In some rare cases, however, they are not fully capable of assessing the effectiveness of expenditure, in which case they are supplemented or replaced by more suitable indicators in the review. One example is the at-risk-of-poverty rate, which is replaced by the change in this rate after the payment of social transfers<sup>4</sup>. The latter better reflects the impact of the public social system on the well-being of citizens, while the at-risk-of-poverty rate itself rather describes the standard of living of the population and significantly depends on the level of the risk before transfers. Annex 7 provides a detailed overview of the indicators used.

**The performance in each area is represented by a composite indicator.** The indicators are reassigned to the relevant COFOG areas so that they can be matched with expenditures. Some indicators are assigned to specific sub-areas, but in many cases, this is not possible because one indicator is often influenced by the policies and expenditures of several sub-areas, or even several areas.<sup>5</sup> The composite indicators (Box 4) are compiled using the Reform Compass methodology ([Habrman, Habodászová a Šramková, 2022](#)). The sensitivity analysis of the selection of indicators can be found in Annex 8.

**Graph 7: Deviations of Slovakia's composite performance indicators from the reference groups**



<sup>4</sup> The initial indicator, i.e. at-risk-of-poverty or social exclusion rate has three dimensions: poverty rate, material and social deprivation and low work intensity. The performance indicator is compiled such that it embeds the replacement poverty rate measure and the other two indicators to be consistent with the General Ledger indicator.

<sup>5</sup> A specific area is public debt transactions, which include mainly interest on debt. However, they arise as a consequence of policies in other areas. Therefore, this study does not evaluate the results for this area.

#### Box 4: Compilation of composite indicators

The performance in an area is represented by a composite indicator (CI). The performance indicators are first normalised around the average using the standard deviation and the so-called z-score. Where possible, they are further divided into sub-areas; for example, education is sub-divided into pre-primary and primary, secondary, tertiary and uncategorised education. A partial composite indicator is calculated for each sub-area over the relevant indicators as the average of the individual normalised indicators. This is expressed by the following formula:

$$ki_i = \frac{1}{N} \sum_{j=1}^N \frac{x_{ij} - \bar{x}_j}{\sigma_j}$$

Where  $ki_i$  is a partial indicator of a sub-area of country  $i$ ;  $N$  is the number of indicators for the sub-area; and  $x_{ij}$  is the indicator  $j$  of country  $i$ , which is normalised around the EU 27 average ( $\bar{x}_j$ ) using the standard deviation  $\sigma_j$ .

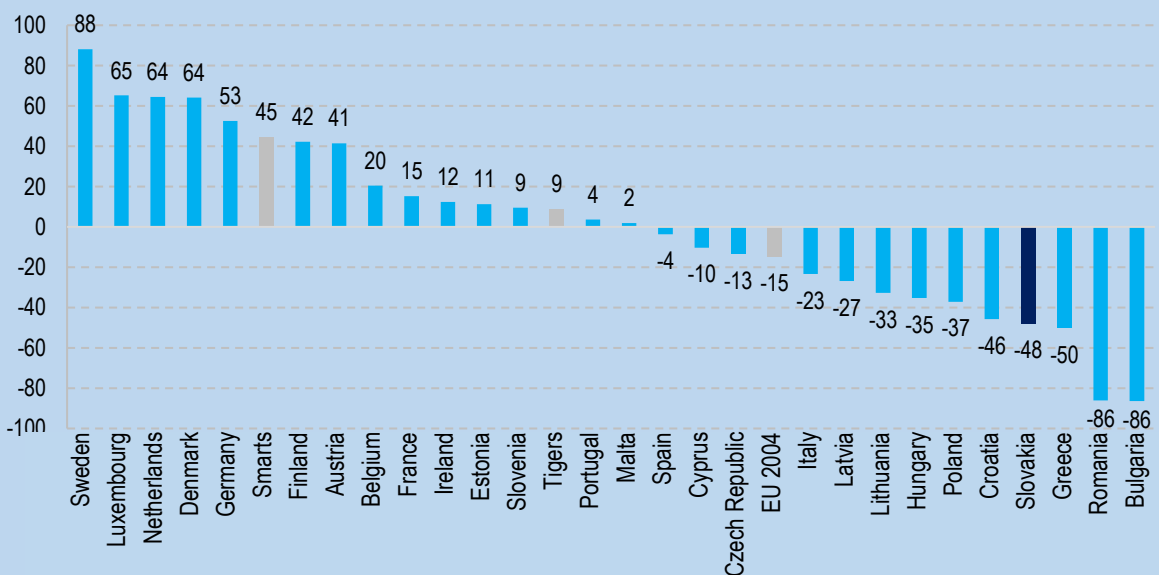
The composite indicator for country  $i$  ( $KI_i$ ) is then calculated as the arithmetic average of the sub-indicators  $ki_i$ . If the indicators are not divided into sub-areas, then  $KI_i$  is equal to  $ki_i$ . Then:

$$KI_i = \frac{1}{M} \sum_{m=1}^M ki_{mi}$$

where  $M$  is the number of sub-areas of the given area. This approach is beneficial in that where there is a larger number of indicators for a particular sub-area of an area, it ensures that each sub-area has the same weight. On the contrary, the drawback is that the weight of a specific indicator depends on the number of indicators. For example, there are four sub-areas in education, secondary education has four indicators, and tertiary education only one. The weight of one indicator for secondary education is  $1/16$  and the weight of the indicator for tertiary education is  $1/4$ .

The approach described above makes it possible to create a composite indicator also at the level of the whole of Slovakia, i.e. to average the composite indicators for all areas. Measured in this way, Slovakia's performance is the fourth poorest in all EU.

Graph 8: Composite indicator for all general government\*

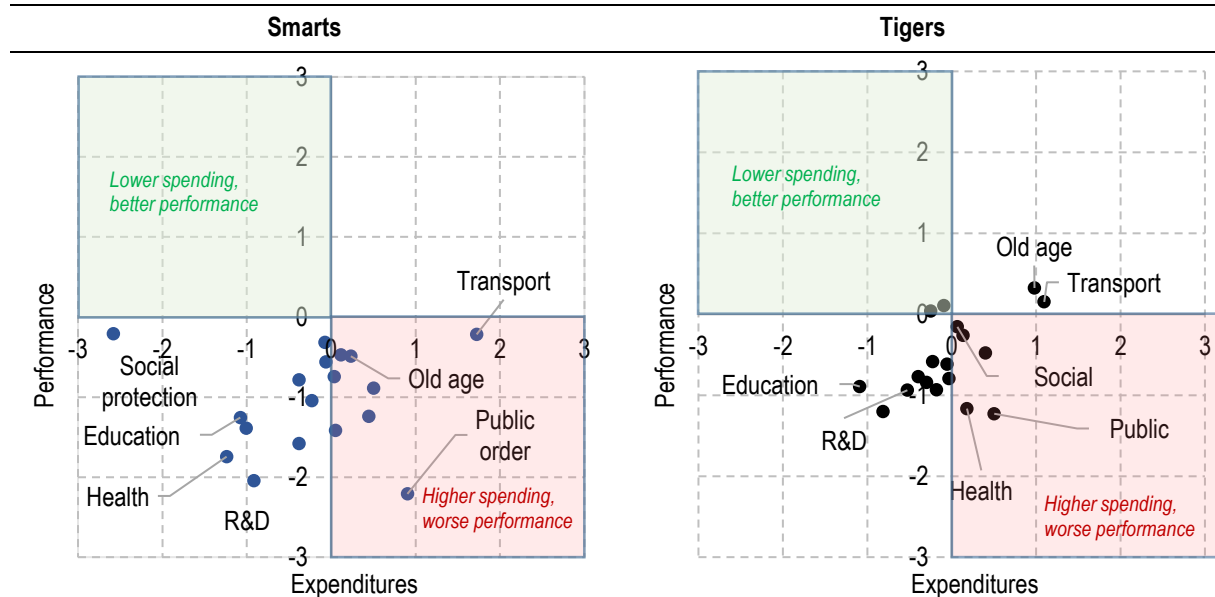


\* The composite indicator is a number between -1 and 1. For presentation purposes, it is multiplied by 100 in the graph.

## 2 A closer look at the differences

Old age, social protection, transport, health, education, public order and research and development are all large spending areas where there are significant gaps against the reference countries in both the amounts spent and the outcomes achieved. Transport, public order, education and research and development differ from the two groups of countries in both expenditure and performance. Social protection and old age are the biggest expenditure items and while we lag behind the Smart countries in performance in the former, and in the latter, on the contrary, we spend more than the Tigers.

**Graph 9: Performance (2020\*) and expenditure deviations (2011-2020), % of GDP**



\*2020 or the latest available.

Source: VIMU's elaboration based on Eurostat data

The following chapters examine more closely 76% of the total public expenditures. Some of the areas with relatively higher deviations are not analysed in greater detail, such as the labour market, the economy or foreign aid. While the performance in those areas is lagging behind, they represent only small expenditure groups which together with the other nine non-reviewed areas make up less than a quarter of public funds.

The analysis of the individual areas aims to assess the adequacy of the differences. The structure of expenditures is analysed in greater depth for each area. The goal is to identify and explain how Slovakia deviates from international practice. Subsequently, the analysis links expenditures to performance and examines the efficiency of spending using DEA models (Box 5).

### Box 5: Spending efficiency using Data Envelopment Analysis (DEA)

The efficiency of spending (maximisation of outputs) in the individual areas is assessed using the Data Envelope Analysis (DEA). DEA measures the country's ability to transform the resources (inputs) spent in an area into measurable results (outputs) by benchmarking against the most efficient countries (for the detailed methodology refer to Annex 5). The countries achieving the best results at a certain level of spending are considered the most efficient.

Two models are constructed for each area, which differ in the inputs used. In one model, input-adjusted public expenditures are considered as a percentage of GDP; in the other, these expenditures are considered on a purchasing power parity (PPP) basis. The parity used partially reflects the problems resulting from the methodology change. This mainly concerns the calculation of housing costs after 2016 for which comparisons between certain countries, including Slovakia, are difficult (Dujava and Žúdel, 2023). Despite the drawbacks of

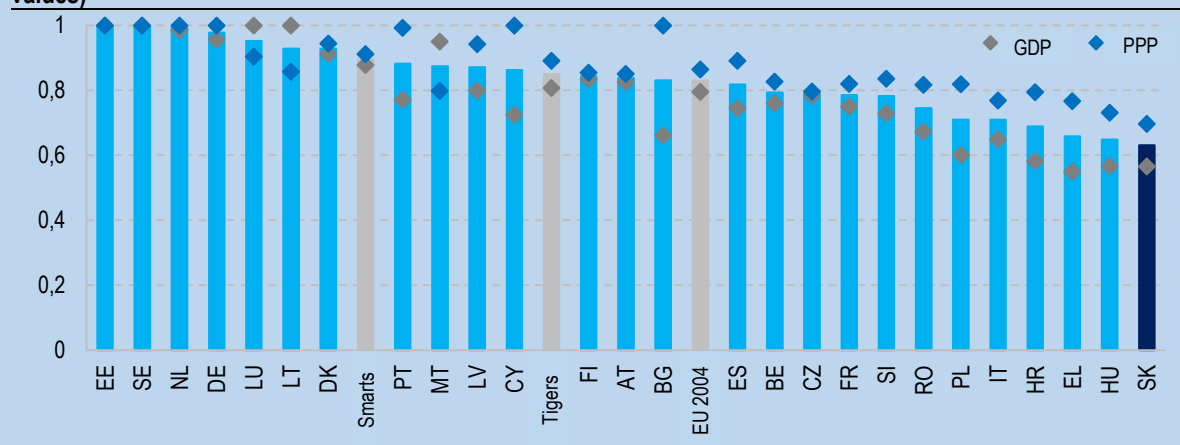
the PPP-based approach, it is not appropriate to use only percentages of GDP. If, for example, two economies had significantly different GDPs but the same population, then the same health expenditure as a share of GDP would mean a different amount of funds in the health sector. The efficiency comparison of the two economies would be biased. For investments, public expenditure inputs are replaced by public capital values. The resulting efficiency of a country is the average of the efficiencies obtained from the two models and the outputs in both models are the composite indicators for the area concerned (Box 4).

The result of DEA is the efficiencies of the individual countries on a scale from 1 (best) to 0 (worst), which represents how a country performs compared to the other countries with similar expenditures. However, this is an abstract score, not an efficiency percentage related to the most efficient countries.

The informative capacity of the calculated efficiencies is affected by the lower number of data points. Depending on the data available for a specific area, the models compare the efficiency of 21 to 26 countries using one to nine indicators. Ireland was excluded from the sample, as it would distort the resulting efficiencies given its significantly lower public spending when considered as a percentage of GDP. However, despite these limitations, by quantifying the relation between expenditure and performance, the DEA results can help to obtain a picture of Slovakia's standing in the EU.

In addition to efficiency in individual areas, it is also possible to calculate efficiency for the general government as a whole. The inputs are the total public expenditures and the outputs are the averages of the composite indicators across all areas. With this model, Slovakia is the least efficient country in the EU.

**Graph 10: Total efficiency according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: VIMU's elaboration

## 2.1 Old age: higher expenditure, average performance

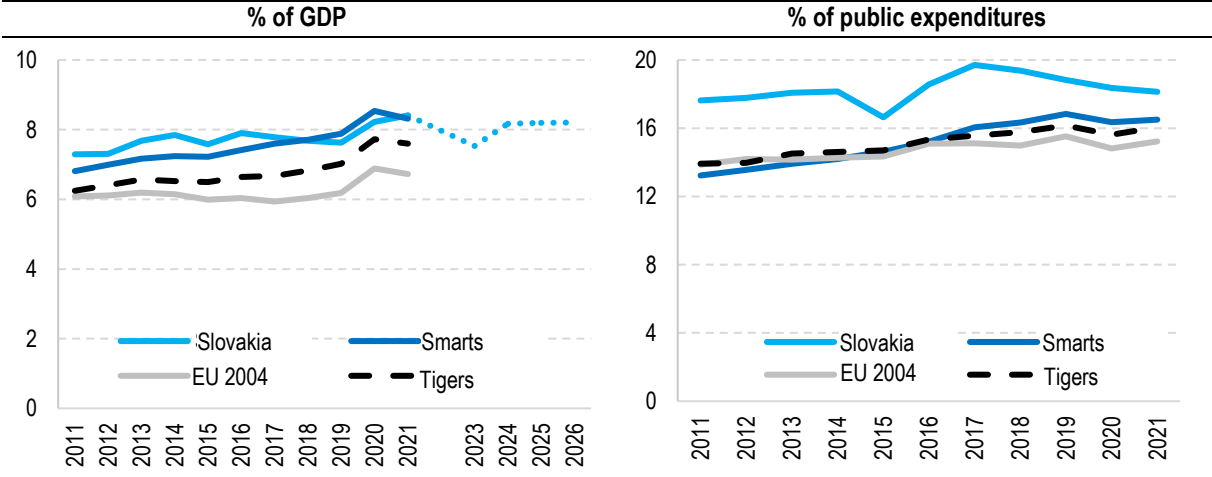
Taking into account the age structure of the country's population and wealth, Slovakia's expenditures on old-age pensions and services related to old age are higher than those of the reference groups: slightly higher when compared to the Smart countries, but significantly above the expenditures of the EU 2004 and the Tiger countries. A pension will replace on average nearly 70% of the pre-retirement net income, which is approximately the same as in the Smart countries, but significantly more than in the Tiger countries. Slovakia is successful in reducing the old-age poverty rate; the group of low-income pensioners should be caught by the social net instead of a blanket system and provided targeted assistance. Smart countries, in contrast to Slovakia, rely less on social benefits and provide services to the elderly to a greater extent (through e.g. social service centres or field social workers).

The primary objective of the social policy in the area of old age is to minimise the risk of poverty and help pensioners when an adverse health condition arises<sup>6</sup>. Direct social benefits and an offer of social services are the most widespread tools used by states to address this problem. Upon reaching retirement age, employees become entitled to a pension that corresponds to their contributions and guarantees an adequate income and affordable and high-quality long-term care services (European Commission, 2017).

In Slovakia, expenditures related to old age amount on average to 7.7% of GDP per year. The country thus ranks slightly above the average of the Smart countries (7.5% of GDP) and significantly above the average of the EU 2004 countries (6.2% of GDP) and the Tigers (6.7% of GDP). Our old-age spending is higher even when taking into account the country's level of wealth and life expectancy in retirement (for more refer to Box 3 and Annex 10).

The old age area has a higher weight in the expenditure structure in Slovakia than in the other groups of countries. The share of expenditures related to old age in total public expenditure has long been the highest of all reference groups. On average, they reach 18% of the general government budget, which is 3.3 percentage points (pp) more than in the countries with the highest quality of life in the EU.

Graph 11: Old age expenditures (COFOG breakdown)

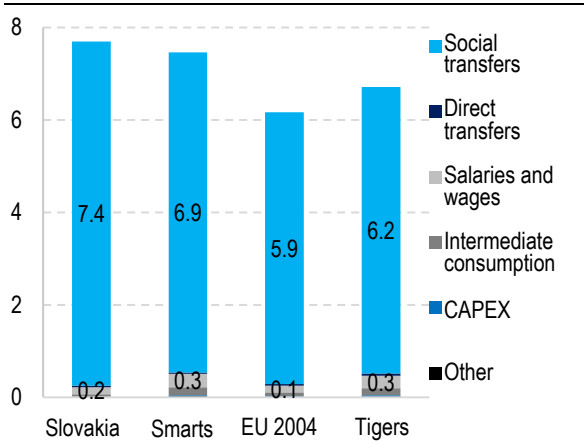


\* The old age expenditures are adjusted for differences in the proportions of the population aged 65 and over compared to Slovakia. Source: Eurostat  
 \*\* The dashed line represents the allocations approved in the GGB for the years 2023-2025.

In addition to providing direct benefits, Slovakia could draw inspiration from the Smart and Tiger countries and focus also on the offer of social services and social workers' wages. The current offer of social services will not satisfy the growing demand of the rapidly ageing population in the future. It is necessary to gradually focus on building social service capacities not only in the form of retirement homes but also in field and community forms of care (Salamonová, 2023). As an example, the Smart and Tiger countries spend on old age services (wages and operations) twice as much as Slovakia. The reason is probably not only the higher number of entities providing care services to pensioners but also the better remuneration of employees (refer to Chapter 2.8).

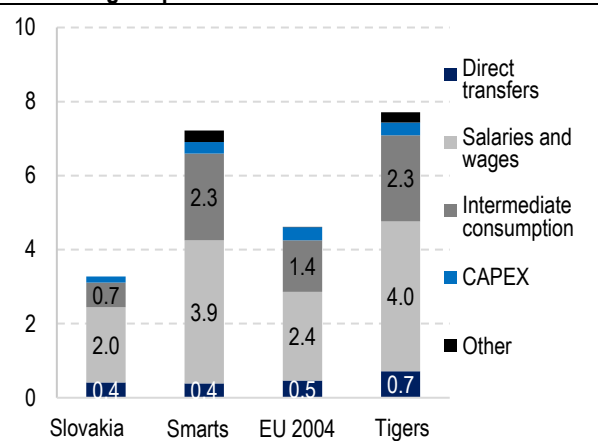
<sup>6</sup> Population in the age group of 65 and over.

**Graph 12: Structure of old age expenditures according to ESA (average of 2011- 2020), % of GDP**



\* The expenditures broken down according to the economic classification are adjusted for differences in the proportions of the population aged 65 and over compared to Slovakia.

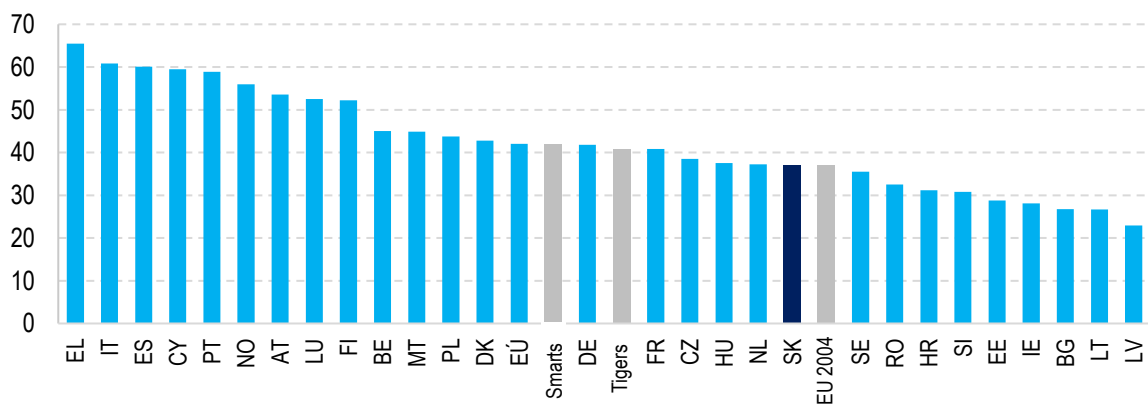
**Graph 13: Structure of old age expenditures according to ESA, excluding benefits (average of 2011-2020), % of total old age expenditures**



\* The graph shows how small is the share of the other ESA expenditures compared to the social transfers (pensions,) which make up the remaining share up to 100%. Source: Eurostat

Following the changes approved in 2022<sup>7</sup>, the pension of an average Slovak pensioner should be at the level of approximately 42% of the average salary, which would bring it closer to the level of the Smart countries. In 2019, the pension was at the level of 37% of the average salary<sup>8</sup>, which is about the same as pensions in the EU 2004 countries. The contributors to the increase were the reform of the first pillar, the increased thirteenth pension benefit amount and the introduction of parental pensions.

**Graph 14: Ratio of public pension to average wage (benefit ratio), 2019, in %**



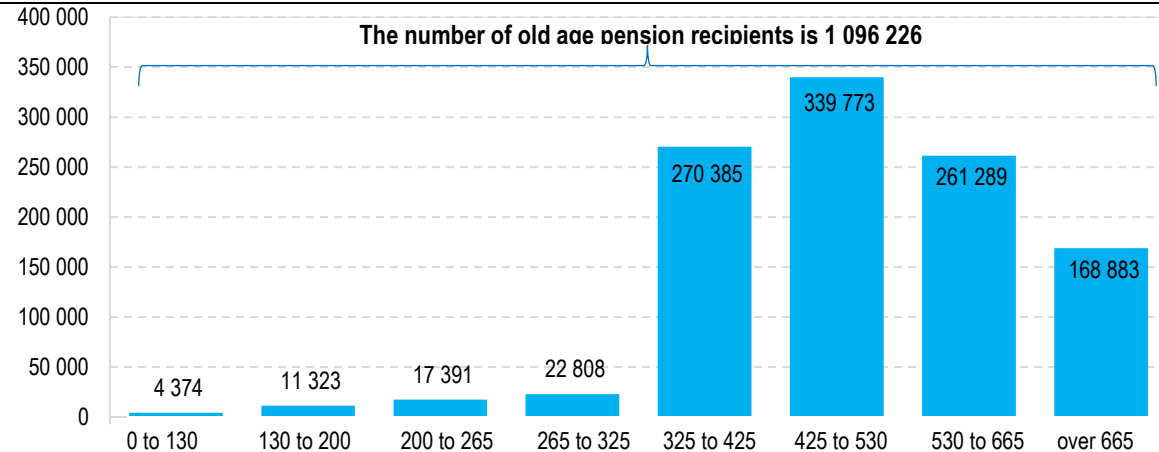
Source: [European Commission, the 2021 Ageing Report](#)

The number of recipients with a higher pension increases every year, mainly because of increases in newly granted pensions. In Slovakia, approximately 40% of pensioners receive a pension higher than EUR 530. The ratio of the average newly awarded pension to the average monthly gross wage in the economy was approximately 48%. As of 30 September 2021, there were 3,314 recipients of old-age pensions exceeding the average monthly wage of EUR 1,211.

<sup>7</sup> Estimate based on the reforms of the first and second pillars adopted in 2022 and implemented in 2023 ( [Slovak Stability Programme for 2023 to 2026](#) ).

<sup>8</sup> These are data for 2019 as the last available internationally comparable data.

**Graph 15: Distribution of old-age pension recipient according to the pension amount in the Slovak Republic as of 12/2021**



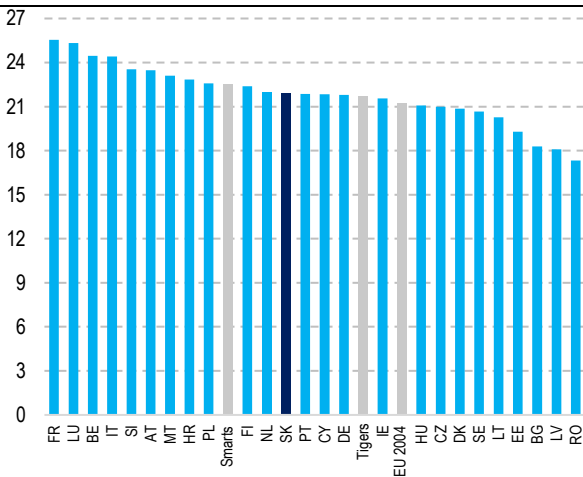
\* Old-age pension alone + old-age pension paid along with widow's/widower's pension.

Source: [MLSAF, 2022](#)

**Despite the earlier retirement age, Slovak pensioners live shorter in retirement than pensioners in the Smart countries.** Slovakia was among the countries with an earlier retirement age: the average age was 63. Only 6 countries had a lower retirement age. Slovak pensioners live nearly 22 years in retirement, which is the same as in the Tiger countries and 8 months longer than in the EU 2004 countries. Despite retiring later, people in the Smart countries live in retirement the longest, 22.5 years, which is mainly because of a longer life expectancy.

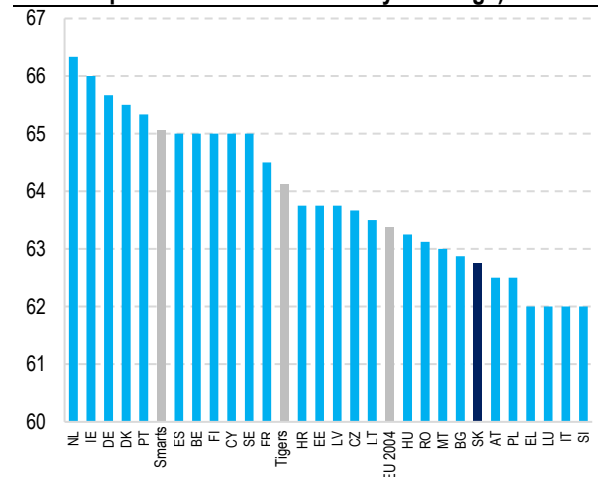
**Relinking the retirement age to life expectancy has a positive effect on the long-term sustainability of public finances.** Several Smart countries (the Netherlands, Germany, Denmark and Sweden) have a retirement age above 65, which contributes to a higher pension in proportion to the average wage.

**Graph 16: Expected number of years in retirement for 2020 retirees**



\* The data take into account the former retirement age cap. From 2023, after the reform of the first pillar, the retirement age in Slovakia is again linked to the growth of average life expectancy.

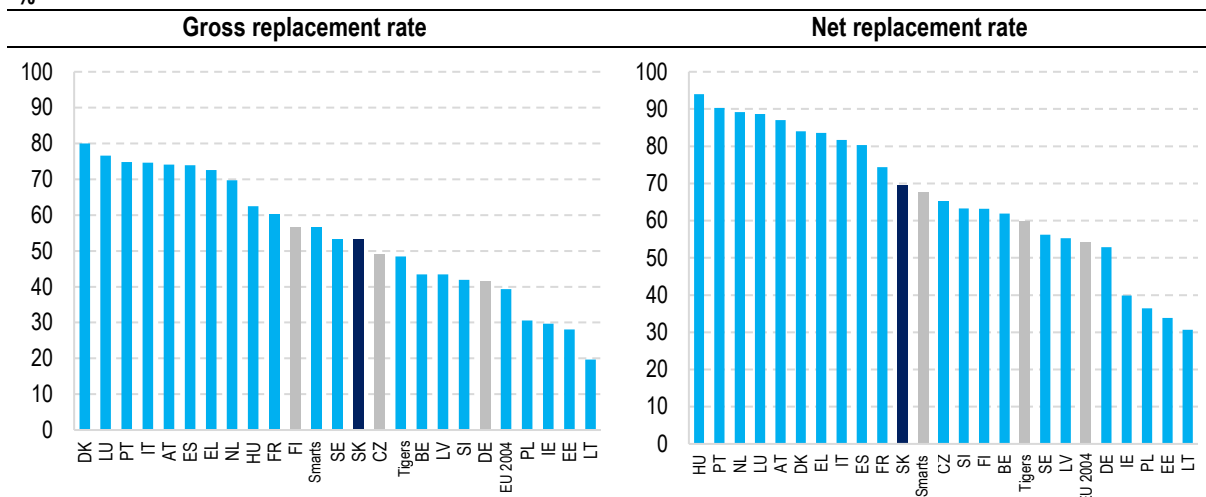
**Graph 17: Average retirement age in 2020 (after an uninterrupted career since the 22<sup>nd</sup> year of age)**



Source: [Pensions at a Glance \(2021\)](#)

**Future Slovak pensioners will receive a net pension in the amount of 69% of their previous income. This puts them at par with the Smarts' average and ahead of the Tigers.** Even some richer countries with a developed social system, such as Sweden and Finland, rank behind Slovakia.

**Graph 18: Expected rate of replacement of earnings by pension (replacement rate) for a pensioner born in 1998, in %**



\* The gross replacement rate is defined as the gross pension entitlement divided by the gross pre-retirement income.

\*\* The net replacement rate is defined as the individual net pension entitlement divided by the net pre-retirement income, taking into account personal income tax and social security contributions

Source: [Pensions at a Glance \(2021\)](#)

**Pensions and expenditures related to old age pose a risk to the future of public finances of rapidly ageing countries like Slovakia. In 2022, several measures were adopted in the pension system which have significantly improved its long-term sustainability.** One of them is the pension system reform<sup>9</sup> which relinks the retirement age to life expectancy<sup>10</sup> and slows down the growth of the pension value<sup>11</sup>. While the demographic development will initially cause the deficit to rise, positive changes will be seen over the long term, in around 2040 ([MF SR, 2023a](#)). For the sake of the sustainability of public finances, it is important to ensure that relevant elements of the reform be further continued even in the future when the savings start to be realised.

### Old age performance

**Slovakia achieves good results in reducing the income poverty rate of pensioners, but it still has a high proportion of elderly people who experience material deprivation.** While 79.5% of pensioners fall below the poverty line<sup>12</sup> before the disbursement of pensions, this proportion drops by 70 percentage points to 9.5% (the lowest among the EU countries except Luxembourg) after the disbursement. The Smart countries are also successful in reducing the poverty rate (reduction of 76.5 percentage points). The pension and other social benefits make up a substantial part of pensioners' income, so the impact on the at-risk-of-poverty rate is high. For material and social deprivation<sup>13</sup> of pensioners, Slovakia is at par with the EU 2004. Almost 20% of pensioners cannot afford to purchase some durable goods (for example, replacement furniture), or items posing a high economic burden (such as unexpected expenditures) or social burden (such as regular leisure activities). Slovakia's overall performance indicator aggregating these two indicators is close to the level of the Tigers.

**Low-income pensioners who, despite their pension, remain below the poverty line and pensioners with significant material deprivation should be caught by the social net, i.e. receive, for example, assistance in material need or housing support.** This would mean a switch from increasing expenditures across the board for

<sup>9</sup> The minimum pension is relinked to the subsistence minimum amount and the increased benefits will not be disbursed from 1 January as usual, but already from mid-2023. Also, the grading of minimum pension rates for pensioners with 50 or more years of pension insurance was adjusted. The indexation of pension benefits was supplemented by an ad-hoc indexation mechanism.

<sup>10</sup> Following the reform, the increase in the retirement age laid down in Act No 461/2003 will remain in effect and the change will only apply to people born in 1967 or later, which means that the effect of relinking the retirement age to life expectancy will be seen from 2031.

<sup>11</sup> The Current Pension Value (CPV) will grow at 95 % of the growth rate of the average wage in the economy, which will have the effect of reducing future newly awarded pensions compared to the former set-up.

<sup>12</sup> The at-risk-of-poverty threshold is expressed as 60% of the median equivalent disposable income.

<sup>13</sup> The proportion of people who cannot afford seven out of the 13 items characterising economic burden, durable goods, basic leisure and social activities.

every pensioner to targeted spending, based on property and income ratios, on those most in need of social assistance.

**Table 2: Comparison of the individual indicators between the groups of selected countries (2020)**

Area	Indicator	Slovakia	Tigers	Smarts	EU 2004
Old age	Change in the at-risk-of-poverty rate after social transfers for the group aged 65 and over (in pp)	70.0	65.7	76.5	57.9
Old age	Material and social deprivation in the group aged 65 and over (in %)	19.0	13.3	4.9	19.1

Source: Eurostat, EU SILC, 2020

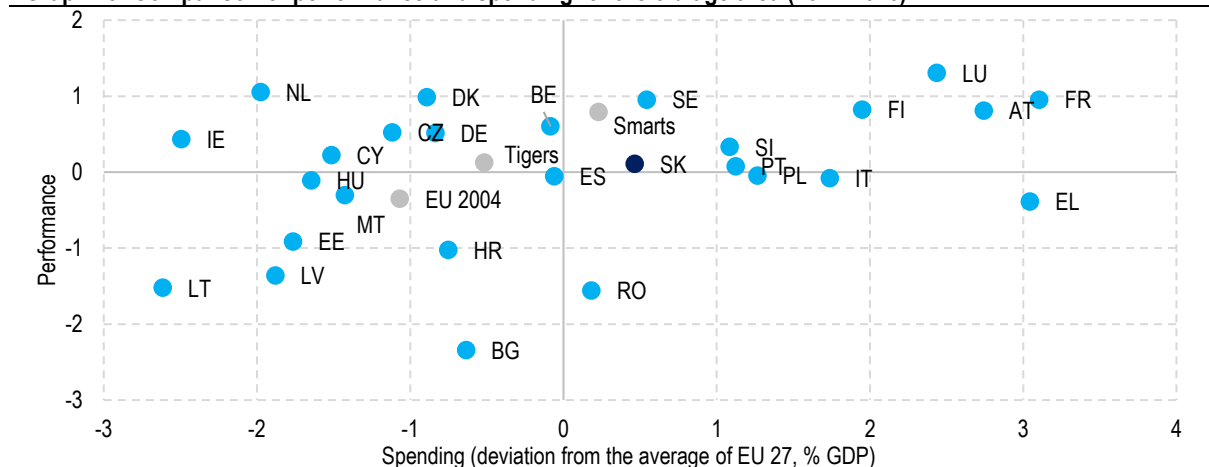
**Table 3: Composite indicators for the old age area: normalised deviations from the EU 27 average**

Area	Number of KPIs	Slovakia	Tigers	Smarts	EU 2004
Old age	2	0.11	0.12	0.79	-0.35

Source: VfMU's calculations

The comparison of the performance and spending deviations puts Slovakia in a group of countries with a slightly higher spending and a slightly better performance. However, the Tigers and the Smarts are more efficient and able to achieve better results with lower expenditures.

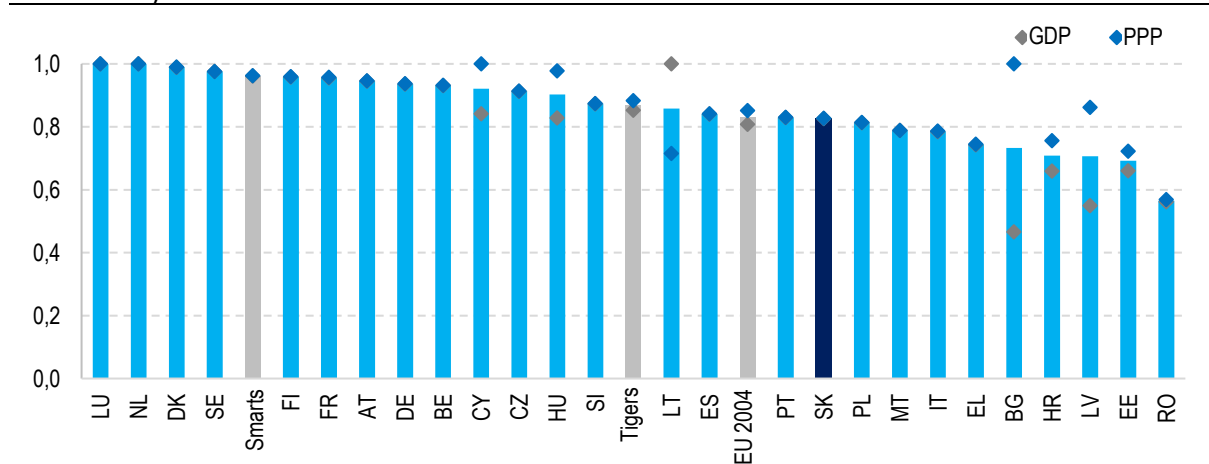
**Graph 19: Comparison of performance and spending for the old age area (2011-2020)**



Source: Eurostat and EU SILC, processed by VfMU

**Slovakia should use its expenditures more efficiently. Despite the high spending, it ranks among the less successful EU countries.** The Smart group countries are the most efficient. According to the DEA model (Box 5), the most successful countries are the wealthy ones with the highest old-age expenditures, which, however, consist of not only transfers, but also targeted social services for the elderly.

**Graph 20: Efficiency in the old age area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, EU SILC, processed by VfMU

## 2.2 Social protection: comparable expenditure, different structure

Social protection is a high-spending area that combines several subjects: support for families with children, unemployment assistance, social housing, sickness and disability, and assistance in material need. Slovakia's spending has long been comparable to the Tigers (the average for both is 7.1% of GDP); the Smart countries spend 9.5% of GDP on average. We are already ahead of the Tigers, and this is mainly because of the rapid growth of support for families with children.

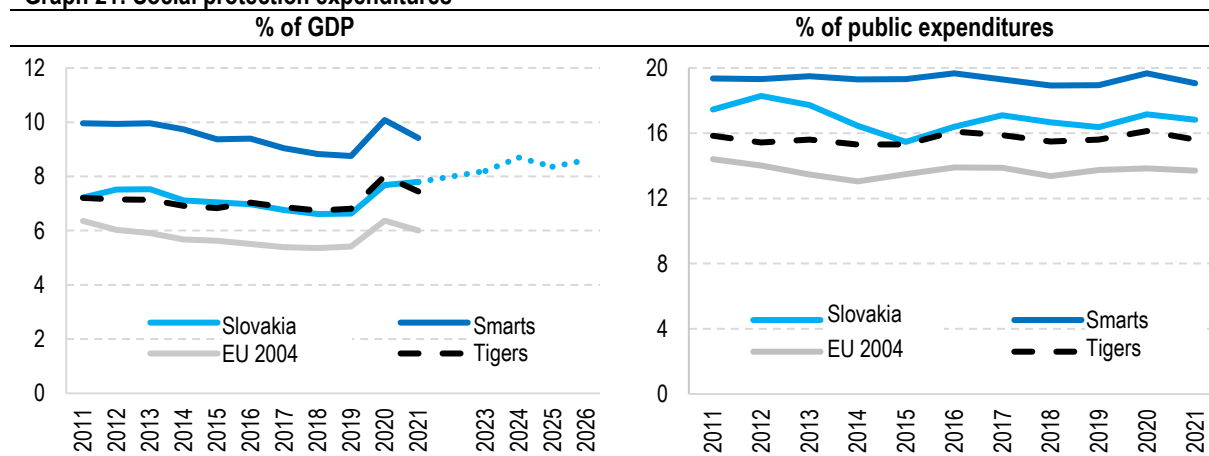
Slovakia relies more on social benefits at the expense of services. The most significant difference is in childcare services such as nurseries and children's homes: the Smart countries, for example, spend on these 28% of family support expenditures and Slovakia's only 7.5%. Slovakia also puts more emphasis on expenditures related to sickness and disability or to families with children than unemployment or material need.

Slovakia's social protection performance is better: for example, the Tigers are slightly worse with similar expenditures and the Smarts achieve only average results at higher costs. A more detailed review of social protection spending could help to identify measures to improve efficiency.

The social protection area covers a wide variety of social issues with a number of varied objectives and it is necessary to carefully consider the instruments to use to arrive at the most effective solution. The common goal of social protection spending is to reduce the share of the population at risk of poverty or social exclusion due to difficult life situations. Social protection policies address a number of areas, from sickness and disability, through support for families with children or housing allowance, to assistance to people in material need. There are several partial objectives in this area and they are approached in varied ways by governments with varied political orientations. The National Reform Programme ([MF SR, 2023b](#)) draws attention to the increased rate of unemployment among low-skilled citizens, members of marginalised Roma communities (MRC) and mothers, and social protection is one of the instruments to reduce it.

The social protection expenditures, considered in the light of demographics, were comparable to the most improving EU countries in the past and are likely to surpass them after 2023 as a result of the changes in the family policy. Compared to the other EU countries, Slovakia's average expenditures, controlled for the country's level of wealth and various unemployment indicators (Box 3, Annex 10), were slightly higher. The increase in spending to 8% of GDP in 2020 was primarily due to the disbursement of pandemic sickness benefits on account of incapacity for work or care for a family member. The Tigers' trend in the last two years indicates a further reduction to the pre-pandemic level, while Slovakia, in contrast, remains at an increased level, mainly because of the Family Package.

Graph 21: Social protection expenditures

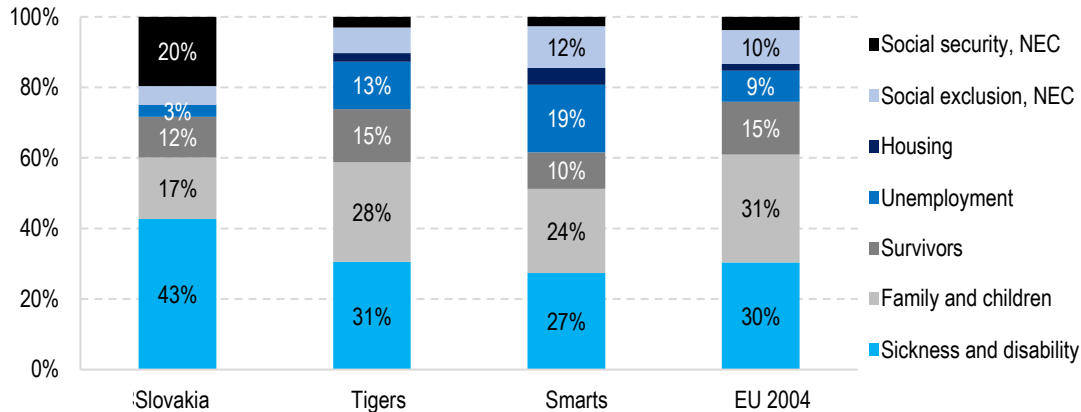


\* The expenditures are adjusted for differences in the proportions of population groups against Slovakia: group aged 65 and over for sickness and group aged 0 to 17 for families and children.

Source: Eurostat

Almost half of Slovakia's spending on social protection goes to sickness and disability assistance and the second largest item is family and child support (17% of the total allocated funds). The other reference groups of countries spend significantly less on sickness and disability (around 30% of the total social protection spending). In contrast, Slovakia has higher proportions of spending on families and children (Slovakia has caught up with the peers in recent years, see Graph 30), on unemployment and on assistance in material and social need.

**Graph 22: Structure of social protection expenditures (average of 2011 - 2020)**



\* In Slovakia, a large part of social security expenditures not elsewhere classified (NEC) is payments for state-insured persons. One exception is payments for pensioners which are included in the old age category.

Source: Eurostat

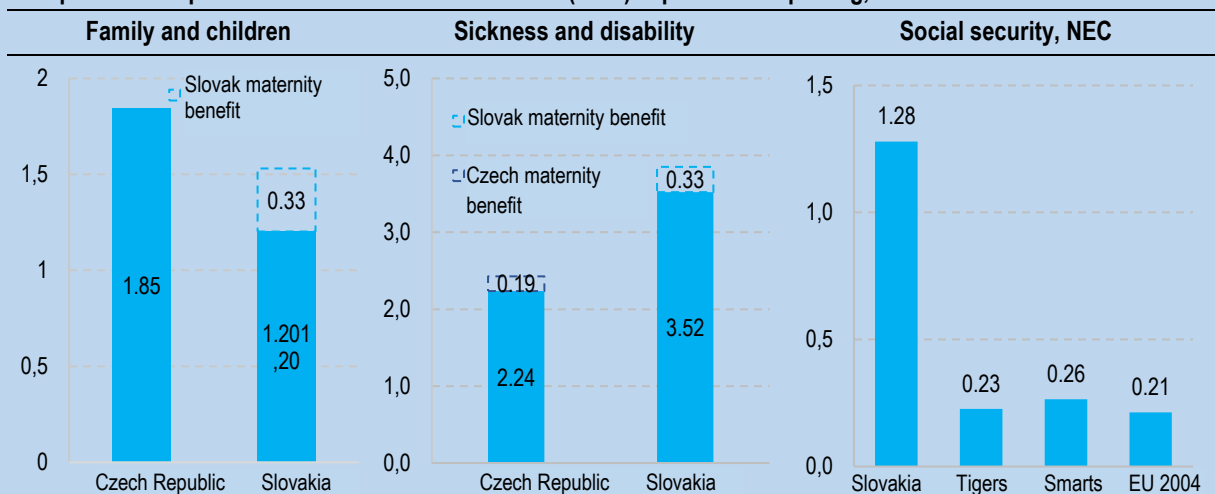
**Box 6: Unclear reporting of expenditures under the COFOG classification**

The reporting of social assistance expenditures under the individual classes is unclear and there are differences in this reporting between countries. This is also why this study also uses the OECD's SOCX classification for the social protection area.

Slovakia, unlike the Czech Republic, reports maternity benefits in the sickness and disability category instead of family and children. In 2020, they amounted to 0.33% of GDP, which would increase Slovakia's spending per family by almost a third.

The amount of Slovakia's expenditures in the social security not elsewhere classified (NEC) category is also questionable (SK: 1.3% of GDP, other groups of countries approximately 0.2% of GDP). This high proportion may be attributable to the reporting of payments made by the state for state-insured persons, such as pensioners, children or persons on parental leave (this is referred to as "payment for state-insured persons"). A major part is reported in the sickness and disability category, some expenditures are recategorised in the old age category and the balance remains in the NEC category.

**Graph 23: Examples of differences in the COFOG 10 (2020) expenditure reporting, % of GDP**



\* Expenditures on the areas adjusted according to the corresponding age groups (the age group 65+ for old age and sickness and disability and the age group 0-17 for family and children).

Source: Eurostat

### Social protection performance

**Social protection results are above the performance levels of the other reference groups.** Slovakia is as successful as the other countries in reducing the risk of poverty<sup>14</sup> through financial assistance. The proportion of people under the age of 65 at risk of poverty has decreased by 15 pp thanks to benefits. For material and social deprivation of citizens (except pensioners), Slovakia is at par with the EU 2004; the lowest material burden and economic and social burden are in the Smart countries. The proportion of people living in households with low work intensity<sup>15</sup> is lower in Slovakia than in the reference groups.

**Table 4: Comparison of indicators between the groups of selected countries (2020)**

Area	Indicator	Slovakia	Tigers	Smarts	EU 2004
Social protection	Change in the risk of poverty after the payment of social transfers in the group under 65 years of age (in pp)	15.0	15.5	15.7	15.3
Social protection	Material and social deprivation in the group under 65 years of age (in %)	5.6	5.2	3.5	5.6
Social protection	Proportion of people living in a household with very low work intensity in the group under 65 years of age (in %)	4.3	6.4	9.1	5.3

Source: EU SILC, 2020

**Table 5: Composite indicators for the social protection area: normalised deviations from the EU 27 average**

Area	Number of KPIs	Slovakia	Tigers	Smarts	EU 2004
Social protection	3	0.43	0.23	-0.02	0.33

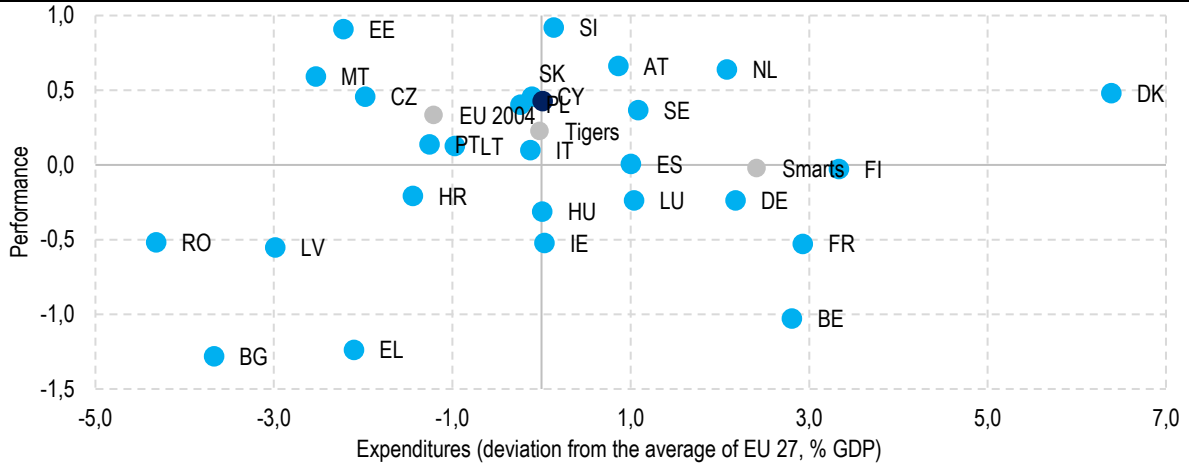
Source: VfMU's calculations

**The Tigers and Slovakia have comparable spending on social protection, but our results are better.** The EU 2004 countries also achieve solid results with a much lower expenditure. The Smart countries stand out the most, but their higher spending has not brought better results.

<sup>14</sup> The poverty risk threshold is expressed as 60% of the median equivalent disposable income.

<sup>15</sup> Households with low work intensity are defined as households in which members of working age worked working hours equal to or less than 20% of their total work potential in the previous year. A household's work intensity is the ratio of the total number of months that all household members of working age worked during the reference year and the total number of months that the same household members could theoretically have worked in the same period.

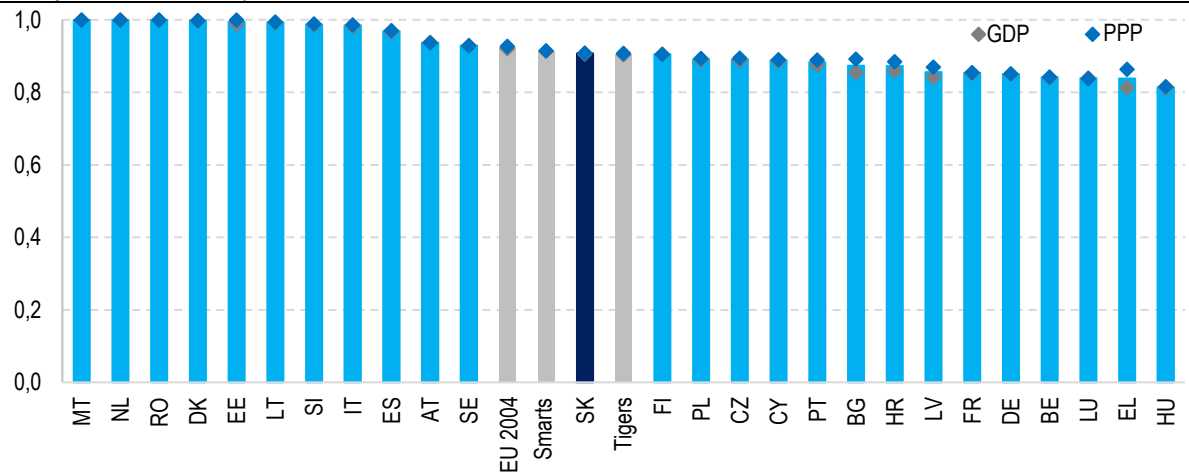
**Graph 24: Comparison of performance and spending for the social protection area (2011-2020)**



Source: Eurostat and EU SILC, processed by VfMU

For social protection, Slovakia is approximately in the middle of the efficiency ranking of the EU countries, together with the Tigers, the Smarts and the EU 2004. The DEA model (Box 5) shows that richer countries with a strong social system are successful, but so are also less developed countries that can achieve good outcomes with relatively low expenditures.

**Graph 25: Efficiency in the social protection area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, EU 2019f, SILC 2018, processed by VfMU

**Box 7: Services vs. benefits in social protection**

The most suitable combination of direct social benefits and a range of social services is difficult to find. The optimal ratio depends on the objectives sought, political preferences and available resources. Social benefits can provide expedited financial assistance and are particularly efficient in countering poverty. However, with a wrong set-up, their recipients may lose motivation to improve their living situation and may become dependent on transfers. High-quality public services improve the quality of life of the population and bring primarily long-term benefits. In the area of support for families with children, for example, the availability of childcare services increases fertility.

**A good practice example: increasing fertility through available services**

The results of empirical studies generally confirm that social policies with a greater effect on increasing fertility include those aimed at:

- a) Reducing the opportunity costs associated with motherhood;

b) Easing the double burden of job work and household work on women's shoulders.

**More effective policies may include access to formal childcare, support for paternal care of young children and generous compensation for the woman's earnings during pregnancy and in the first year after childbirth.** This particularly applies to women with higher education and a higher earning potential in the labour market who on average have fewer children than low-skilled women ([Sobotka et al., 2019](#))

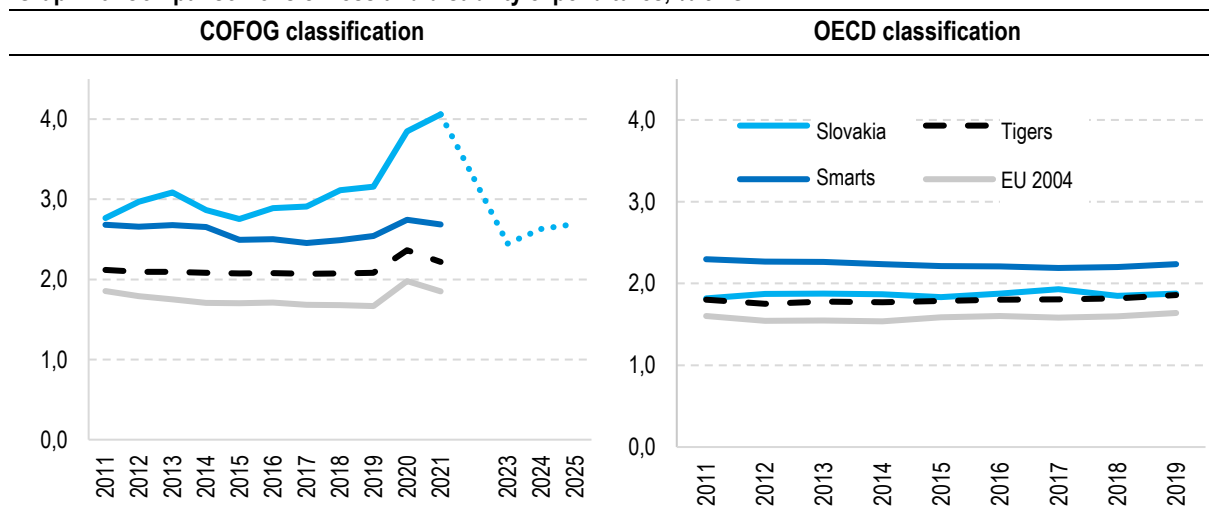
**The impact of across-the-board benefits (such as parental allowance, child allowance or childbirth allowance), in contrast, is generally lower, or even zero (or positive, but temporary).** The same applies to tax reliefs that are more widely used by working fathers and which may reduce women's motivation to return to the labour market, such as non-working spouse tax credits ([Wesolowski and Ferrarini, 2018](#)). Some studies suggest even a negative relation between the length of parental leave and fertility.

## Sickness and disability

**Slovakia spends more on sickness and disability than even the most developed EU countries (SK average: 3.0% of GDP vs. Smarts: 2.6% of GDP).** In 2020, Slovakia spent up to 4% of GDP on sickness benefits, the reason being mainly high claims on account of incapacity for work and care of a family member during the pandemic. The general government budget suggests that these expenditures will reach the level of 2.5% of GDP in the near future, which matches the level of the other countries.

**The higher level of spending of Slovakia compared to the Tigers and the EU 2004 is also confirmed by other data sources.** Looking at the sickness and disability area according to the OECD classification, Slovakia (1.9% of GDP) has higher expenditures than the Tigers (1.8% of GDP) and similar countries (EU 2004: 1.6% of GDP). The OECD database covers expenditures on disability pensions, sickness and family member care benefits, care services provided by social facilities and at-home and rehabilitation services. It does not include maternity benefits, which may explain a part of the decrease in Slovakia's expenditures compared to expenditures according to the COFOG classification. According to the OECD, the Smart countries spend the most, 2% of GDP on average. The expenditures were constant throughout the monitored period and there were no significant fluctuations.

**Graph 26: Comparison of sickness and disability expenditures, % of GDP**



\* For the OECD classification, the EU 2004 group is without Malta and Cyprus.

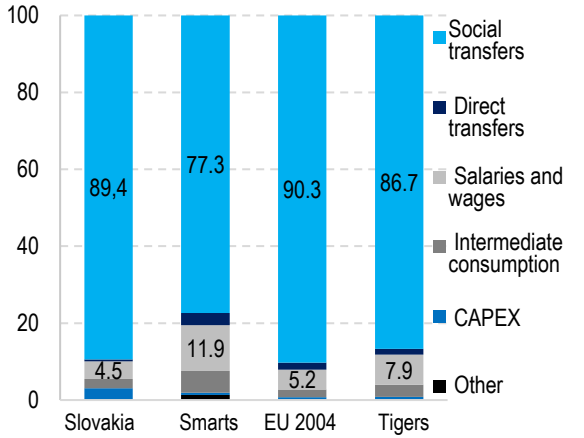
Source: Eurostat a OECD

\*\* The sickness expenditures are adjusted for differences in the proportions of the population aged 65 and over.

**In Slovakia, a large portion of the expenditures (89%) goes to direct benefits such as disability pensions, disability compensation allowances and sickness insurance benefits. The Smart countries' structure of expenditures favours services more (wages and intermediate consumption).** The Smart countries spend almost three times more on social care services, such as nursing provided at home or in special facilities.

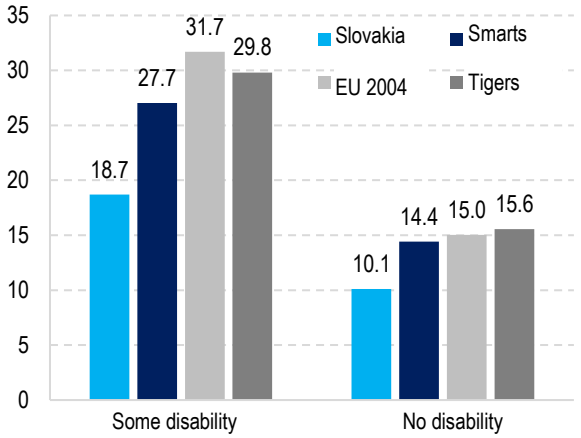
The at-risk-of-poverty rate for disadvantaged people is significantly lower in Slovakia than in the Smart countries and the Tigers. Transfers have a significant effect in reducing the poverty rate. For persons with severe disabilities, a part of the transfers is disability pensions.

**Graph 27: Comparison of the structure of expenditures in the sickness and disability area (average of 2011-2020), % of the total expenditures on this area**



Source: Eurostat

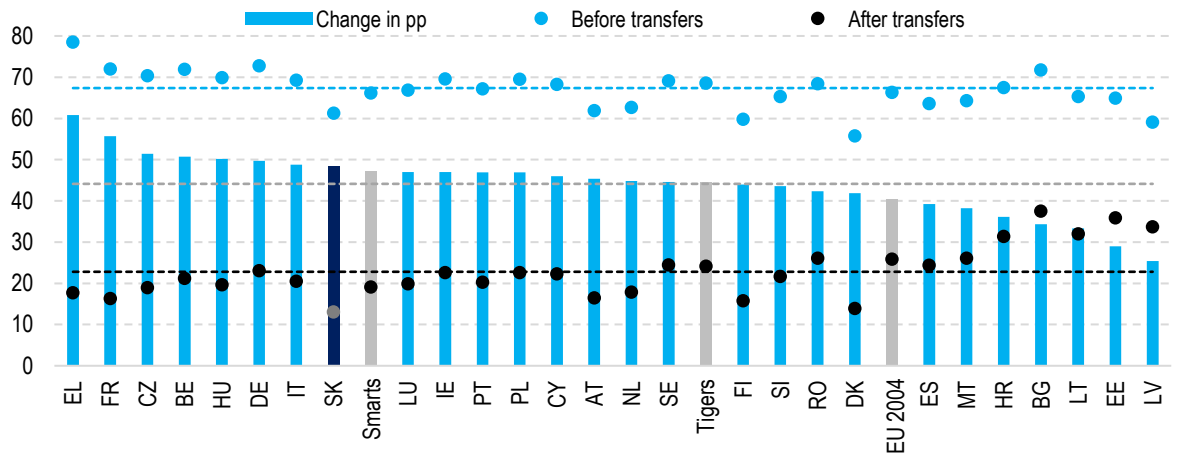
**Graph 28: At-risk-of-poverty rate (2020), in %**



Source: Eurostat, EU, SILC

The social system in Slovakia has been successful in reducing the risk of poverty among people with disabilities for a long time<sup>16</sup>. Social benefits significantly reduce the share of health-impaired persons below the poverty line, from 61.3% to 13%, i.e. by over 48 percentage points. With this high reduction, Slovakia exceeds all of the Smart, Tiger and EU 2004 averages. The average decrease in the EU countries is 44 percentage points (Graph 29).

**Graph 29: At-risk-of-poverty rate for persons with disabilities before and after social transfers (2020), in %**



Source: Eurostat, EU, SILC

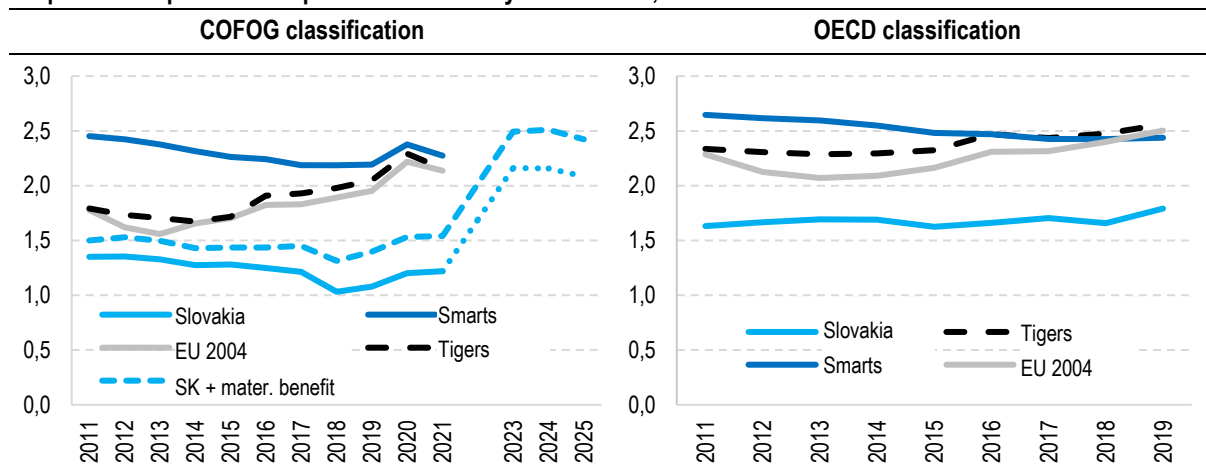
### Family and children

While in the past Slovakia lagged behind all groups of countries in spending on family and children, now, after the changes, it is getting ahead of them. This falling behind was slightly reduced by the adjustment and inclusion of maternity benefits which the Slovak system otherwise categorises in the sickness and disability area (Graph 23). After the adjustments adopted as a part of the Family Package, Slovakia's spending in 2023 is higher than that of the Smart countries.

<sup>16</sup> Disability is defined as a difficulty in performing basic activities.

**The family policy changes adopted in 2022 eliminated the lagging of family support in proportion to GDP, even relative to the Smart countries.** While Slovakia's expenditures on family support according to Eurostat amounted to 1.2% of GDP in 2020, they will rise to 2.2% of GDP in 2022. The Smart average for 2021, controlled for demographics, was 2.3% of GDP.

**Graph 30: Comparison of expenditures on family and children, % of GDP**



\* For the OECD classification, the EU 2004 group is without Malta and Cyprus.

Source: Eurostat and OECD

\*\* The family and children expenditures are adjusted for differences in the proportions of the population aged 0 to 17 compared to Slovakia.

**The largest contributor to the growth of family support expenditures in the period from 2018 to 2022 is the introduction of the Family Package with effect from 2022 and an increase in parental allowance from January 2020 (Table 6).** A significant increase in spending is driven by the child tax credit increase (adopted to compensate for the abolition of free school lunches in 2021) and the maternity benefit increase (in May 2017; claims from men have rapidly grown in recent years). A pregnancy benefit was introduced in 2021; the related spending amounts to EUR 32 million and is supposed to further rise to EUR 56.7 million in 2023. After these changes, Slovakia does not lag behind the Smart countries in supporting families with children.

**Table 6: Development of family support expenditures since 2018 (EUR million)**

EUR million	2018 O	2019 O	2020 O	2021 O	2022 O	2023 E	2024 D	2025 D
<b>Benefits</b>	<b>1,008.0</b>	<b>1,075.2</b>	<b>1,298.6</b>	<b>1,489.2</b>	<b>1,531.9</b>	<b>1,988.6</b>	<b>2,158.9</b>	<b>2,263.5</b>
Child birth allowance	44.1	43.4	43.0	42.6	44.1	44.6	43.8	43.8
Child allowance	313.1	328.0	338.0	419.6	464.9	789.7	827.9	831.5
Parental allowance	368.7	377.4	581.7	649.9	605.7	649.0	719.6	770.6
Maternity benefit	253.6	299.6	308.5	316.4	335.7	410.2	465.9	509.2
Pregnancy allowance	-	-	-	32.0	46.6	56.7	63.1	68.3
Other periodic cash benefits <sup>17</sup>	15.0	14.5	14.3	15.4	16.8	18.5	20.0	21.2
Allowance for a dependent child under assistance in material need (estimate)	7.5	7.1	7.1	7.1	8.8	9.1	9.4	9.4
Maintenance replacements	6.0	5.2	6.1	6.4	9.2	10.8	9.2	9.5
<b>Services</b>	<b>126.5</b>	<b>150.6</b>	<b>167.8</b>	<b>192.8</b>	<b>187.1</b>	<b>206.3</b>	<b>205.2</b>	<b>209.1</b>
Institutional care in state children's homes	72.2	85.8	100.6	99.6	108.4	121.2	114.5	114.5
Institutional care in non-state institutions	11.9	18.9	21.8	44.4	25.4	26.3	27.3	27.4
Daily childcare <sup>15</sup>	40.0	43.0	42.6	45.7	50.0	55.1	59.4	63.0
Household assistance <sup>15</sup>	2.4	2.9	2.9	3.1	3.4	3.7	4.0	4.2
<b>Tax reliefs</b>	<b>269.1</b>	<b>332.6</b>	<b>364.3</b>	<b>409.7</b>	<b>624.5</b>	<b>1,221.9</b>	<b>1,238.4</b>	<b>894.6</b>
Child tax credit <sup>18</sup>	269.1	332.6	364.3	409.7	624.5	1,221.9	1,095.1	894.6
<b>Total</b>	<b>1,403.6</b>	<b>1,558.4</b>	<b>1,830.7</b>	<b>2,091.7</b>	<b>2,343.5</b>	<b>3,416.8</b>	<b>3,602.5</b>	<b>3,367.2</b>
<b>% of GDP</b>	<b>1.6 %</b>	<b>1.7 %</b>	<b>2.0 %</b>	<b>2.1 %</b>	<b>2.1 %</b>	<b>2.8 %</b>	<b>2.8 %</b>	<b>2.4 %</b>

Source: MF SR, MLSAF SR, SO SR, VIMU's calculations

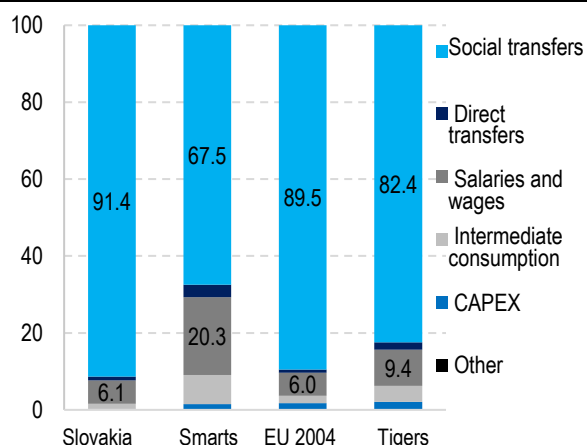
**Slovakia's family support is benefit-centred, while the Smart countries focus on a range of provided services, such as an accessible network of nurseries and children's groups.** This is probably also a factor in the employee compensation differences: the Smart countries spend 20% of their expenditures on wages, Slovakia only 6%. In recent years, there has been an equalisation with the Smart countries in the total spending on family and children, but the structure is fundamentally different. The Family Package further highlights the disparity between direct transfers and services.

**It is also because of the lack of services for families that Slovakia has the lowest rate of employment of mothers with children under the age of 3. The employment of mothers of school-aged children is comparable (Graph 32).** Prolonged inactivity in the labour market reduces mothers' attainable income and they are thus "penalised" for motherhood. Work experience together with education are among the most important factors determining the amount of income from employment. Empirical studies have confirmed that the so-called motherhood penalty, which is the wage gap between mothers and childless women, is significantly higher in the CEE region than the other regions, which is mainly due to relatively long maternity and parental leave ([Cukrowska-Torzewska and Matysiak, 2020](#)). In Slovakia, even six years after the first birth, mothers work on average 2.5 months less per year and their wages are 33% lower than if they had not had children ([Čerman and Dujava, 2021](#)). Increasing social benefits at the expense of building services for families with children will preserve the current situation rather than contribute to its correction.

<sup>17</sup> Only data till 2019 were available for the "Other periodic cash benefits", "Daily childcare" and "Household assistance" expenditure items. The estimate for the years 2020 and 2025 is based on the assumption of an unchanged share of GDP.

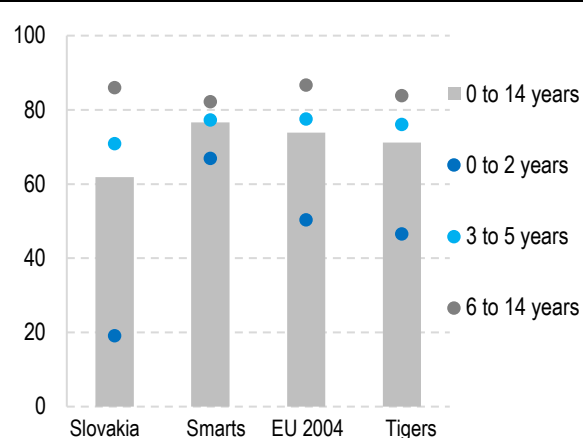
<sup>18</sup> The child tax credit is supposed to be reduced to EUR 100 with effect from 1 January 2025.

**Graph 31: Comparison of the structure of expenditures in the family and children area (average of 2011-2020), % of the total spending on the area**



Source: Eurostat

**Graph 32: Employment of mothers by youngest child's age (2019 or the most recent available), in %**



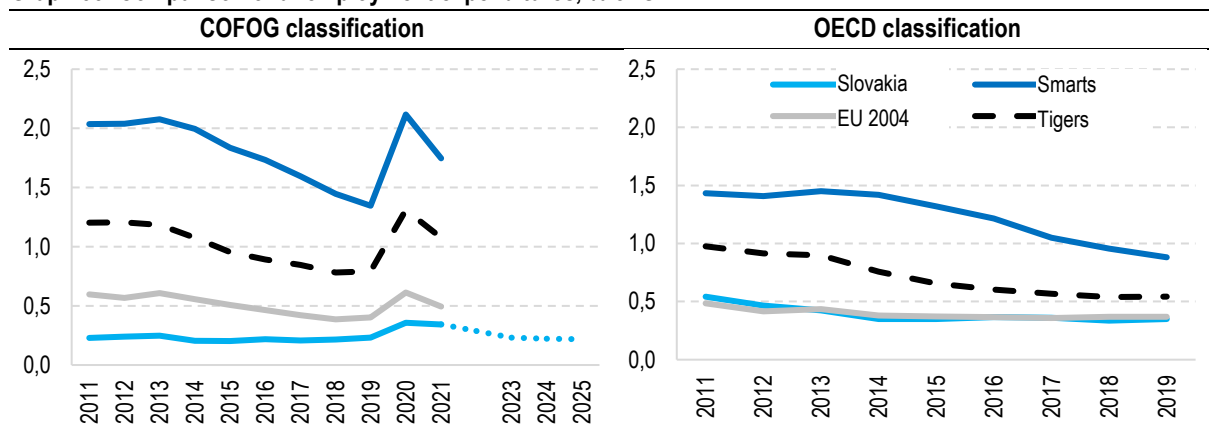
\* EU 2004 without Cyprus and Malta.

Source: OECD

## Unemployment

**Slovakia lags behind in supporting the unemployed. While the Smarts and the Tigers increase assistance to the unemployed in times of crisis and reduce spending in times of economic growth, Slovakia's support remains at the same level for an extended time.** It recorded a slight increase in the pandemic years. The unemployment area includes<sup>19</sup> the operation of the unemployment insurance system and provision of social protection in the form of benefits, advice to the unemployed and social prevention.

**Graph 33: Comparison of unemployment expenditures, % of GDP**



\* For the OECD classification, the EU 2004 group is without Malta and Cyprus.

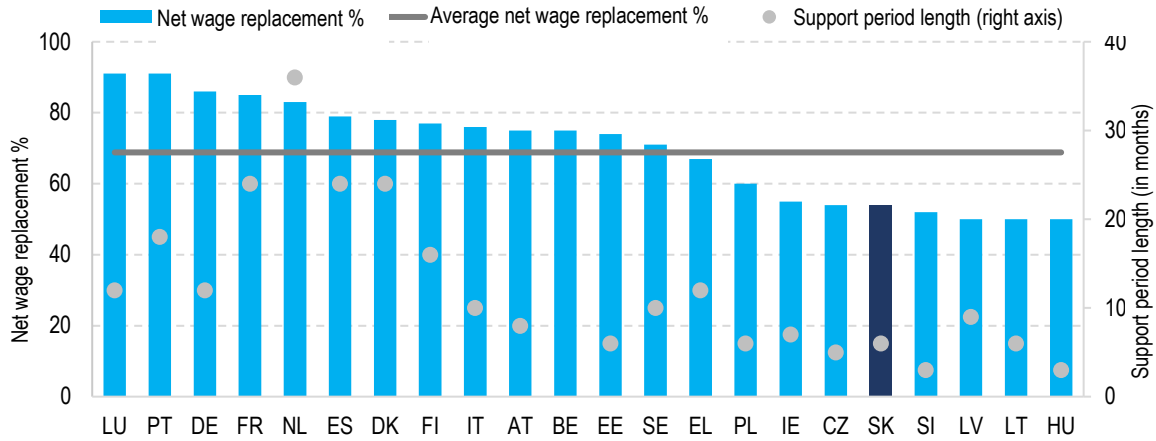
Source: Eurostat a OECD

\*\* The expenditures are adjusted for the proportion of the unemployed (in the age group 20-64) in the total population.

**The unemployment benefit system of the Slovak Republic is one of the strictest among the EU countries, the reason being the effort to motivate the unemployed to find a job as quickly as possible.** To be eligible for unemployment support, a person must be unemployed for at least two years out of the last four years. The support period is six months, which is at the shorter end in comparison to the other EU countries (Graph 34). The benefit amount remains unchanged during the six months.

<sup>19</sup> According to the [Explanatory Notes to the COFOG statistical classification](#), expenditures on general plans and programmes supporting labour mobility and the employment of disadvantaged persons or other population groups (ALMP) are not included in the expenditures on the unemployment area.

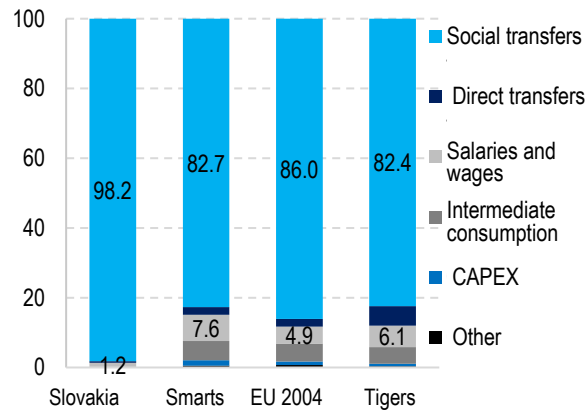
**Graph 34: Net wage replacement rate (%) and duration of unemployment support (in months, 2020)**



\* The percentage of net wage replacement for 12 months applies to a couple with two children with income from employment at the average wage level. The length of the support period in the individual countries applies to two years of unemployment insurance. Source: OECD, MISSOC

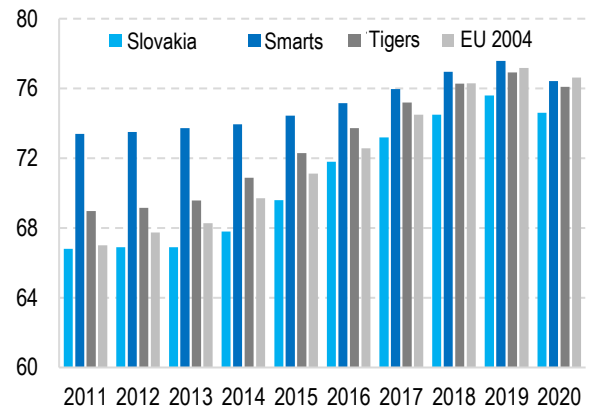
**Unemployment is another area where transfers prevail at the expense of services, mainly when compared to the Smart countries and the Tigers.** Slovakia spends six times less on unemployment services (operation of the unemployment insurance system and support for job creation programmes) than the Smart countries, and this is despite the fact that it has a somewhat lower population employment rate.

**Graph 35: Structure of expenditures in the unemployment area (average of 2011-2020), % of the total spending on the area**



Source: Eurostat

**Graph 36: Employment rate (in %, for the population aged 20 - 64)**



Source: Eurostat

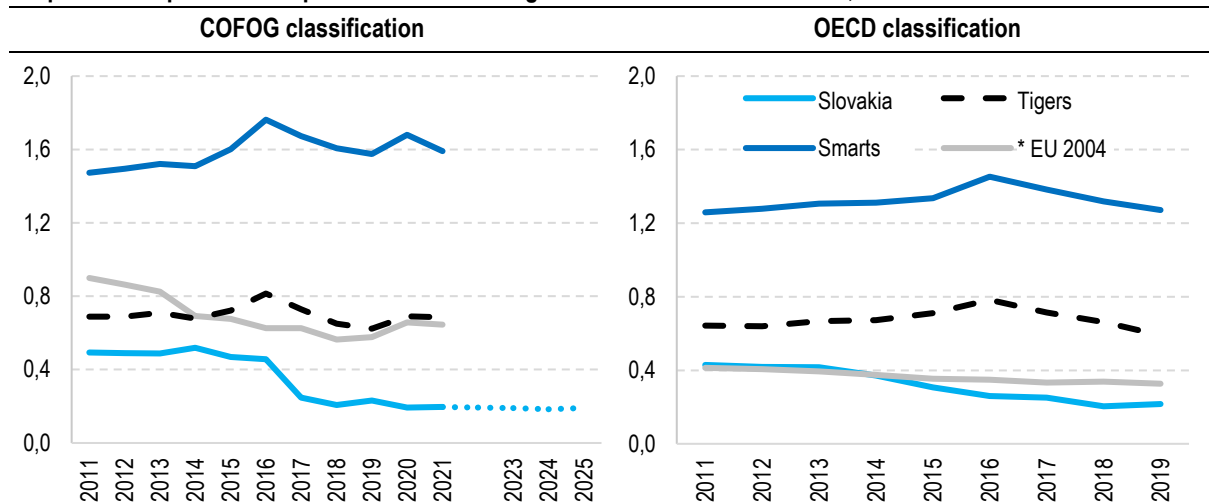
## Housing and material need

The system of assistance in material need is designed to cover households that cannot or do not know how to secure or increase their income through their own work. The assistance is based on the constitutional guarantee<sup>20</sup> ensuring basic living conditions and consists of a benefit in material need, an activation allowance, a protection allowance, a dependent child allowance and a housing allowance. The total assistance amount partially reflects the specific circumstances of an individual household and the activity of its members.

**Slovakia lags behind all groups of countries in the financing of housing assistance and assistance in material need.** Between 2011 and 2014, Slovakia was spending 0.5% of GDP annually and was thus catching up with the Tigers; since 2017, the spending has been cut to about a half.

<sup>20</sup> Act No 417/2013 on assistance in material need, as amended.

**Graph 37: Comparison of expenditures on housing and material need assistance, % of GDP**

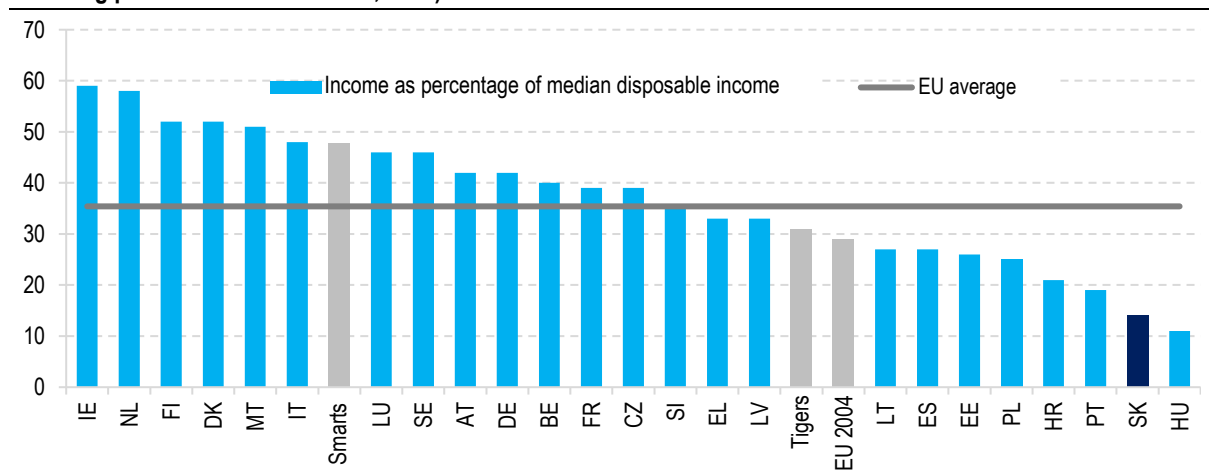


\* For the OECD classification, the EU 2004 group is without Malta and Cyprus.

Source: Eurostat and OECD

**Slovakia is among the least generous countries when it comes to minimum income benefits.** The average amount of the benefit and additional allowance to the benefit<sup>21</sup> is EUR 145. The guaranteed minimum income system protects citizens against the complete loss of income. In our country, it takes the form of assistance in material need. The number of recipients registered in 2021 was 58,808. The countries that joined the EU in 2004 guarantee to their citizens without children an income of 29% of the median income on average (however, the variance is large, from 11% in Hungary to 50% in Malta). The Tigers provide 30% of the median income and Slovakia 14%.

**Graph 38: Net income of a recipient of the minimum income benefit\* as a percentage of median income (non-working persons without children, 2020)**



\* Housing allowance included.

Source: OECD

<sup>21</sup> The average amount of the benefit calculated on the basis of the amount disbursed under a standard claim in 2021.

### 2.3 Healthcare: spending commensurate to the country's wealth

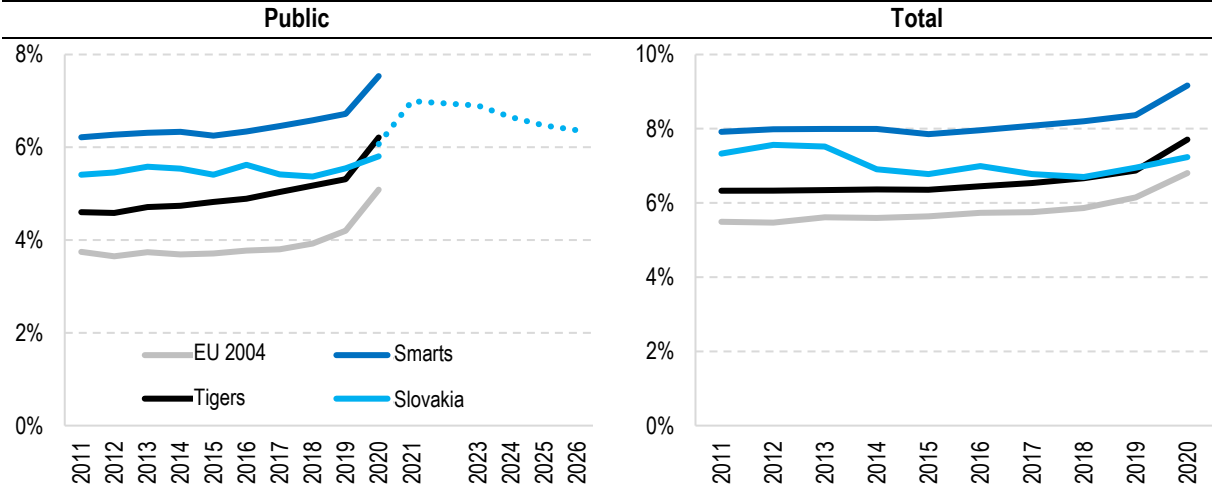
**Slovakia's spending on healthcare corresponds to the economic level of the country. Richer countries usually spend a higher proportion of their GDP on healthcare. Slovakia spends about as much (5.8% of GDP in 2020) as similar countries (5.9% of GDP for the EU 2004 countries), and even slightly more after adjustment for demographics.**

**The performance measured by avoidable mortality, and by the composite index which takes into account the female and male life expectancy and infant mortality, is poor. Slovakia achieves worse outcomes than countries with similar expenditures and, taking into account the demographics, even worse outcomes than countries with significantly lower expenditures. The DEA efficiency is among the lowest of the EU countries. Efficiency improvement must become an inevitable condition before any increase the healthcare spending.**

**Slovakia's public spending on healthcare is proportional to the economic level of the country.** In 2020, the total healthcare expenditures reached 7.2% of GDP; 5.8% of GDP is public funds and the rest is direct payments by households<sup>22</sup>. Slovakia's share of GDP spent on healthcare from public funds is comparable to the average of the EU 2004 countries (5.9%) and lower than the average of the Tigers (7.5%) and the Smart countries (8.9%). In general, the richer a country is, the more it spends on healthcare - not only in nominal terms but also as a share of GDP.

**The healthcare expenditures depend on the age structure of the population.** Older citizens consume more healthcare, but each country has a different age structure of the population. The presented data are, therefore, controlled for demographics, i.e. the expenditures for the other countries are adjusted as if they had the same share of citizens over 65 as Slovakia. When the age structure of the population is taken into account, Slovakia even spends a little more than the EU 2004 countries. The regression model also indicates that when adjusted for the age structure and wealth of a country, Slovakia's expenditures on healthcare are higher than the other countries' spending (Box 3, Annex 10 Results of regression models).

**Graph 39: Healthcare expenditure, SHA methodology (adjusted for demographics), in % of GDP**



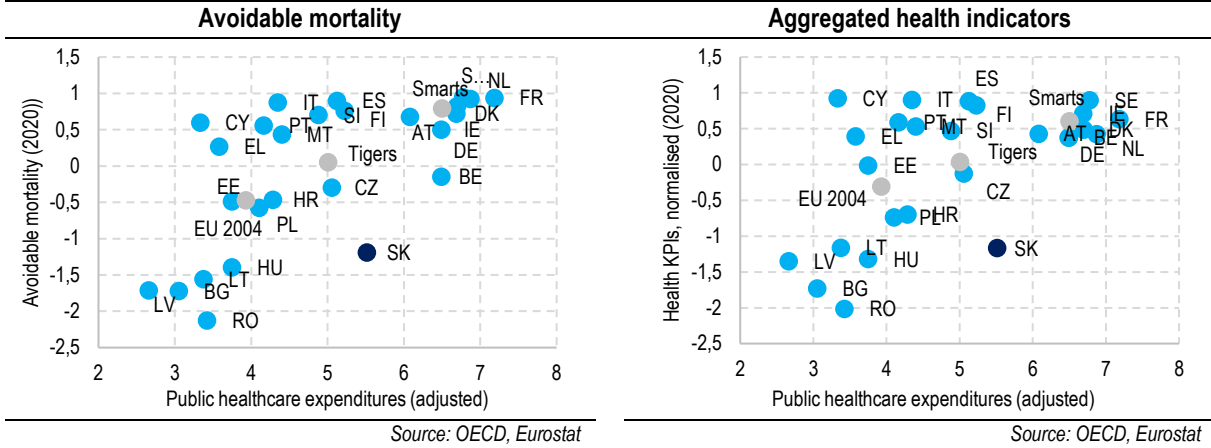
Source: Own elaboration based on OECD data

**Slovakia spends approximately as much on healthcare from public sources as corresponds to the wealth of the country,** and even more if demographics are taken into account. Richer countries spend a larger share of their GDP on healthcare from public sources. Without adjustments for demographics, Slovakia does not stand out

<sup>22</sup> The public healthcare expenditure data are taken from the OECD statistics. The OECD data are based on the SHA (System of Health Accounts) methodology. Another alternative is the interlinked COFOG and ESA 2010 methodologies, under which the public spending on healthcare in 2020 amounted to 6.1% of GDP in 2020. However, public hospital expenditures are counted twice under the COFOG and ESA 2010 approaches.

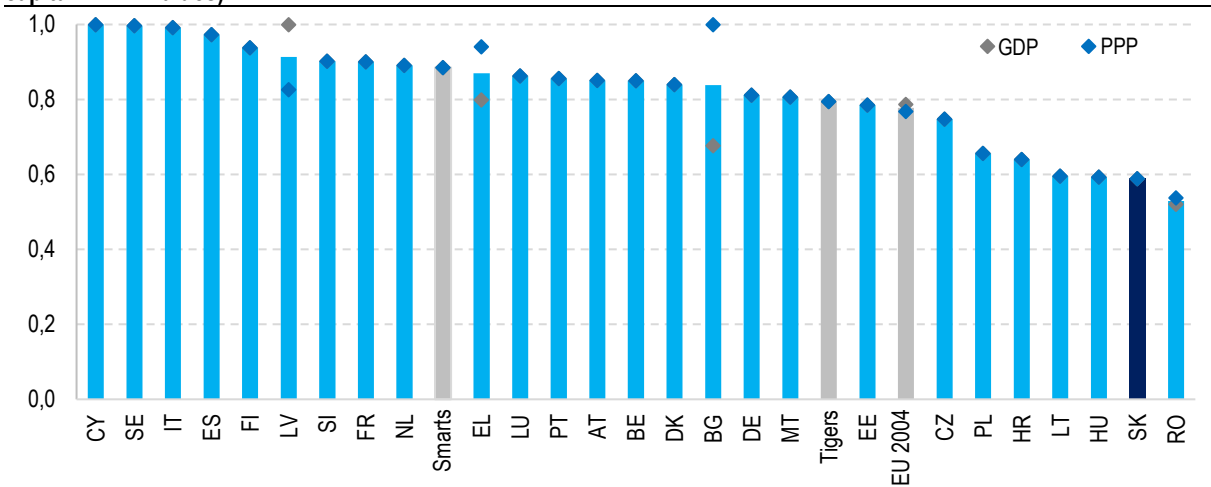


**Graph 41: Relation between a county's wealth and expenditure on healthcare (2020)**



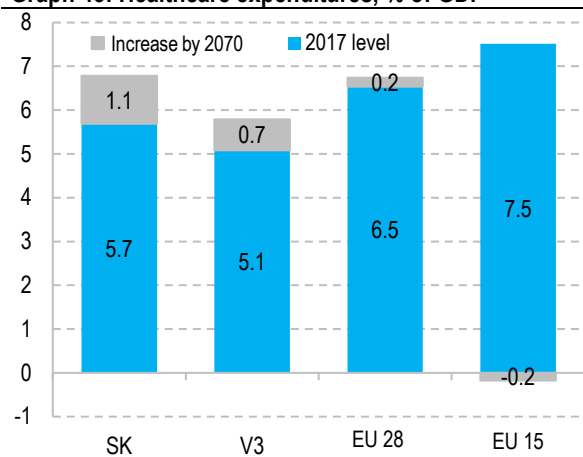
**Preventable mortality is not the only healthcare performance indicator where Slovakia delivers poorly.** An index compounded of several indicators, for example, the life expectancy of men and women, infant mortality and mortality avoidable by healthcare and prevention, also indicates a worse performance than other countries with similar expenditures. On the other hand, countries with similar performance have lower expenditures than Slovakia. As regards the DEA public spending efficiency, Slovakia's healthcare system is the second worst in the EU (Box 5). And it is even the worst one in the alternative DEA model which takes into account not only public but also private expenditures.

**Graph 42: Efficiency in the healthcare area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



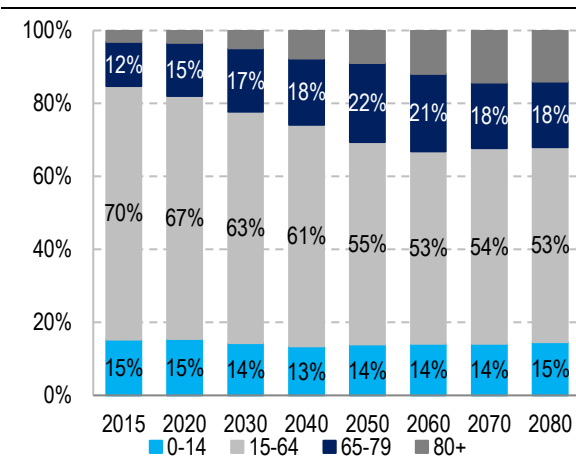
**The pressure on higher healthcare spending will even grow over time and a partial solution to this is the improvement of efficiency.** The European Commission (EC) forecasts that with the ageing of the population, Slovakia's healthcare expenditures will grow as the third fastest in the EU and the fastest among the V4 countries (EC, 2021). The reason is the rising average life expectancy and a low birth rate. According to the EC's forecast by 2070, Slovak public expenditures on healthcare will rise by another 2.5 percentage points to 8.2% of GDP. The main reason is the growing need for healthcare in older age; for example, the annual healthcare costs of an average 75-year-old man are approximately 7 times higher than those of a 25-year-old. Slovakia's healthcare policy should, therefore, first of all, seek to ensure an effective allocation of funds and the proper functioning of the system, which should be followed by a controlled increase in expenditures in line with the ageing forecast and economic development.

**Graph 43: Healthcare expenditures, % of GDP**



Source: EK (2017)

**Graph 44: Age structure development forecast**



Source: Eurostat

## 2.4 Education: poor performance that corresponds to low spending

The spending on education has been low for a long time. Slovakia spends 4.1% of GDP on this area, which is approximately 1.2 percentage points less than the Smart, Tiger, and EU 2004 countries. Despite some growth seen recently, we are still markedly falling behind in spending on pre-primary and primary education. The difference slowly narrows for the secondary level. The expenditures on tertiary education are decreasing in Slovakia at approximately the same rate as in other countries. Slovakia achieves poor results compared to all groups of countries.

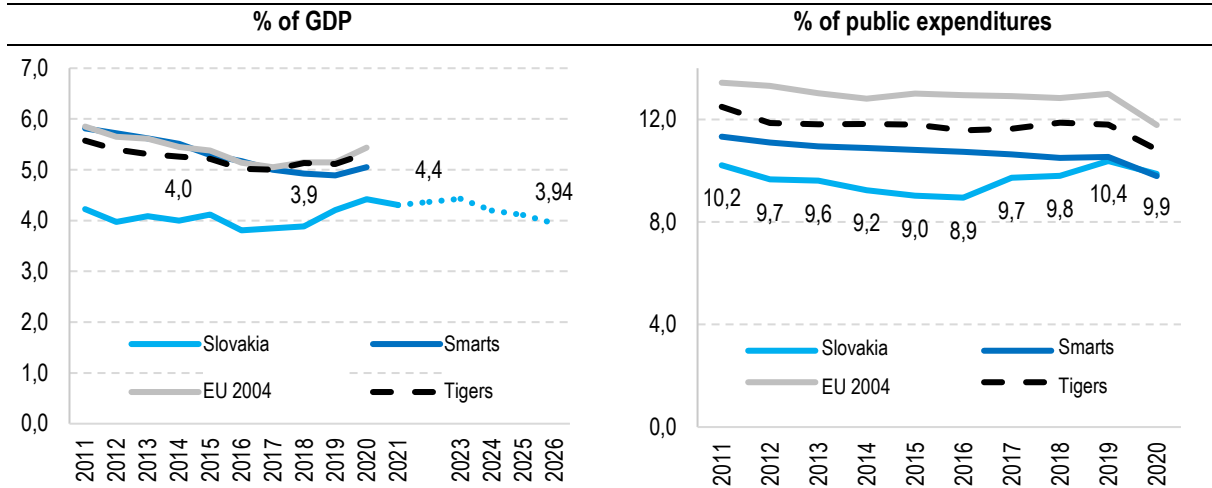
**Education plays a key role in the development of both individuals and society as a whole.** The acquired knowledge and skills are necessary for effective involvement in public life and the economy. Education can improve people's lives in areas such as work, health, civic participation and political interest. Studies show that educated individuals live longer, are more actively involved in politics and the community in which they live, commit less crime, and rely less on social assistance ([World Development Report, 2018](#)).

**Slovakia lags behind in financing education: the average expenditure between 2011 and 2020 is 4.1% of GDP. Countries with the highest quality of life spend 5.3% of GDP on average.** The level of funding for education is 1.1 percentage points below the Tigers and 1.3 percentage points below the EU 2004 countries. The difference in Slovakia's spending persists even when the country's wealth, demography and post-Soviet past are taken into account (Box 3 and Annex 10).

**The expenditures on education<sup>23</sup> are also lower when considered as a proportion of the total public spending, although there has been some rising trend in recent years.** If education was a priority to governments, it should be manifested through increasing the expenditure on this area as a share of the total public spending. The average share of education expenditures in Slovakia's total annual public spending is 9.6%. The lag is greatest compared to the EU 2004 countries, which spend on education an average of 12.9% of the total public spending.

<sup>23</sup> This study uses the Eurostat's education expenditure data, which are categorised according to the ISCED 11 classification. The pre-primary and primary levels (ISCED 0 and 1) correspond to kindergartens and the lower grades of primary schools. The secondary level (ISCED 2 and 3) corresponds to the upper grades of primary schools and all types of secondary schools (secondary grammar schools (*gymnázium*), vocational schools, conservatories, etc.). Tertiary education (ISCED 5,6,7,8) includes all levels of education at colleges and universities.

**Graph 45: Education expenditures, COFOG methodology**



\* Adjusted for differences in the age structure of the population and controlled for demographics for the population aged 3 to 25 years.

Source: Eurostat

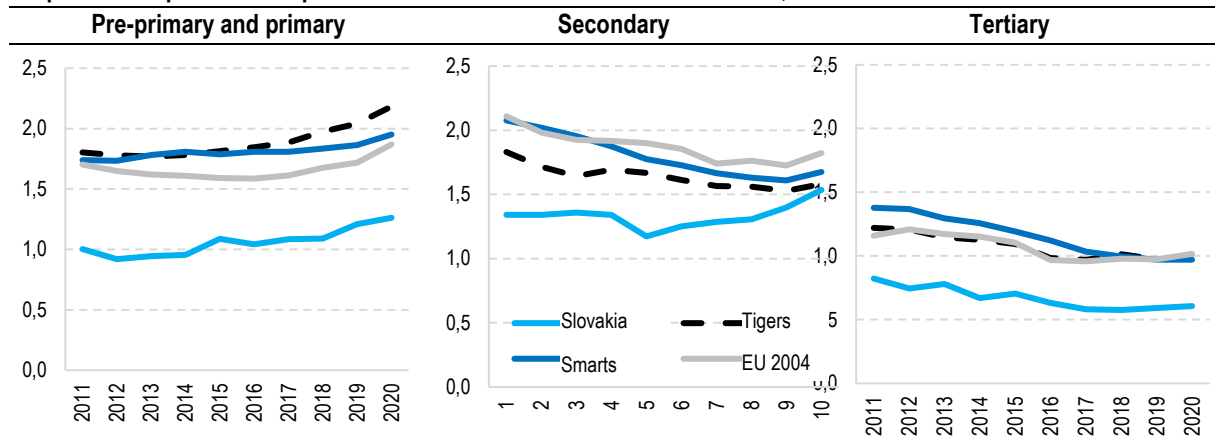
**Pre-primary education brings benefits that last even in adult life.** Children who complete pre-primary education are better prepared for the next grades, achieve better academic results, repeat grades less often and have better scores in cognitive ability tests ([Esping-Andersen et al., 2012](#)). Participation in education is also associated with a higher income, better health and lower crime rates in adulthood. Access to educational institutions taking care of children also helps parents to return to the labour market earlier. The benefits are demonstrably the greatest for children from a poorer socioeconomic environment ([Slaby et al., 2005](#)).

**The funding of the pre-primary and primary levels of education is where Slovakia lags behind the most.** The spending on primary education as a % of GDP has grown slightly since 2011, but so have the expenditures of other countries. Slovakia has thus for long been unable to reduce the difference compared to the reference groups. The Tigers spend the most and in recent years they have even surpassed the Smart countries. The spending plan for 2023-2025 is at the EU 2004 level, mainly thanks to investments from the Recovery and Resilience Plan (RRP).

**The expenditures on secondary education are catching up with those of other countries.** In recent years, Slovakia has increased its spending, while the spending of the other countries has gradually decreased. Slovakia's catch-up happened mainly through a gradual rise in employee compensations. This is one of the factors that have enabled the closing of the gap in financing secondary education compared to the Smart countries: the difference from 2011 decreased to 0.2 pp by 2020.

**The expenditures on the third level of education have been decreasing over years and a similar trend can be observed in other countries, too.** Nevertheless, Slovakia is still lagging behind the Tiger and Smart countries and the gap was 0.4 pp in 2020. Between 2011 and 2020, about 0.7% of GDP on average went to tertiary education, in contrast to 1.1% of the other countries.

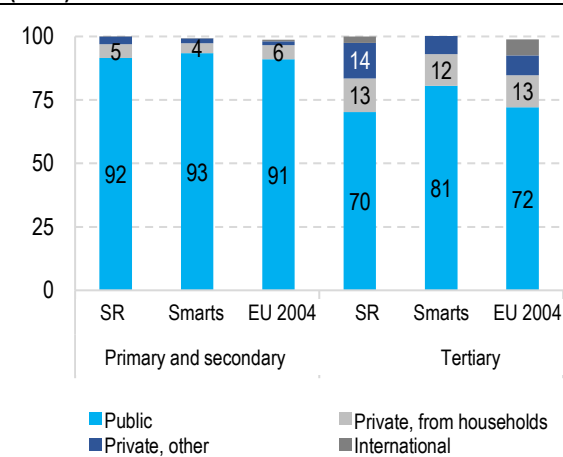
**Graph 46: Comparison of expenditures on the different levels of education, % of GDP**



\* The expenditures in each area are adjusted according to the relevant age groups of population (3-10 years for pre-primary and primary education, 11-19 years for secondary education and 20-25 years for tertiary education). Source: Eurostat

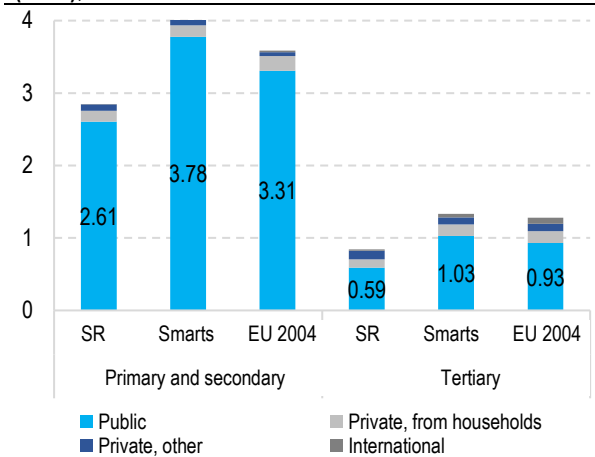
**Slovakia’s ratio of public to private funding of primary and secondary education does not much differ from those of the Smart and EU 2004 countries.** Public resources make up approximately 92% of education expenditures (2.6% of GDP). For tertiary education, the ratio of public resources is approximately the same as in the EU 2004 (70% vs. 72%).

**Graph 47: Public to private education funding ratio (2019)**



Source: Education at Glance (2022), OECD

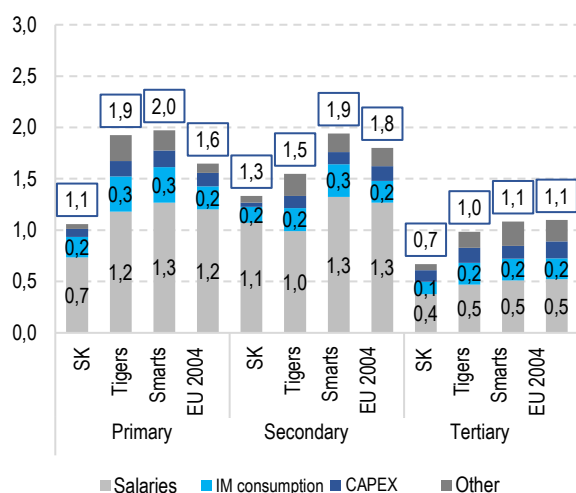
**Graph 48: Public to private education funding ratio (2019), % of GDP**



Source: Education at Glance (2022), OECD

**A major portion of the education expenditures is salaries of teaching and non-teaching staff (70%) and a much smaller portion is intermediate consumption, capital expenditure, and other categories.** The structure is approximately the same as in the EU 2004 countries, but the Tiger and Smart countries spend a smaller part on compensations. The Tigers’ expenditures on compensations in secondary education account for 64%, while in Slovakia they amount to as much as 80%. This may be due to differences in the organisational structure and relations between education providers and the public sector.

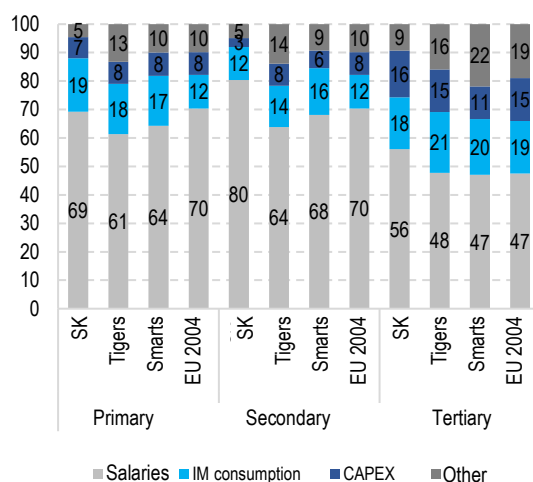
**Graph 49: Breakdown of education expenditures into ESA categories (average of 2011 -2020), % of GDP**



\* The "Other" category consists of social benefits, subsidies, income from assets and other ordinary transfers.

Source: Eurostat

**Graph 50: Structure of expenditures in the education area (average of 2011-2020), percentage of the total spending on the area**



\* "IM consumption" means Intermediate consumption  
Source: Eurostat

## Education performance

**Slovakia lags behind the other groups of countries not only in terms of the amount of spending but also in that its performance is below average<sup>24</sup>.** The results of the international PISA testing 15-year-old students are sub-standard, although a trend of improvement has been seen in recent years. Fourth graders fall behind the reference groups in testing, too. However, the share of pupils with poor results in reading literacy is the highest among the compared countries. On the contrary, the percentage of pupils who finish secondary education prematurely is lower in Slovakia. The proportion of the population with a university degree is still relatively lower than in the Smart countries, but the gap is narrowing.

**Table 9: Comparison of indicators between the groups of selected countries (2020 or the latest available)**

Area	Indicator	Slovakia	Tigers	Smarts	EU 2004
Pre-primary and primary	Proportion of children in pre-primary education (from 3 years to the beginning of compulsory primary education, in %)	78.1	92.6	95.3	91.0
Pre-primary and primary	TIMSS and PIRLS (average scores of 4th graders in TIMSS19 and PIRLS21 testing)	520.0	529.3	527.0	531.0
Secondary	Proportion of pupils below baseline level in PISA reading literacy, in %	31.4	18.5	18.9	24.0
Secondary	Early leavers (% of population aged 18 - 24)	7.6	9.6	7.9	8.3
Secondary	Employment of secondary school leavers (ISCED 3-4) (in %)	79.1	79.4	80.6	79.8
Secondary	PISA (average score)	458	498.3	499.8	483.1
Tertiary	Tertiary degree attainment (% of population aged 30 - 34)	39.7	41.5	48.7	45.8
Uncategorised	Horizontal mismatch between secondary and tertiary schools (ISCED 3-8) (in %)	35.0	27.4	27.3	27.3
Uncategorised	Adult learning (% of population aged 25 - 64)	2.8	11.2	16.2	7.6

Source: Eurostat, OECD, TIMSS and PIRLS

**Slovakia is lagging in education performance not only behind the Smart group but also far behind the countries that joined the EU together with us in 2004.** The gap is present in all areas of education. The worst scores (except uncategorised indicators for lifelong learning) are achieved in pre-primary and primary education, despite this being the sub-area of education that can bring the greatest benefits to society.

<sup>24</sup>There are several international performance indicators; the analysis relies on two for the pre-primary and primary levels, four for the secondary level and one for the tertiary level. The overall composite indicator also includes two indicators that cannot be assigned to any of the areas.

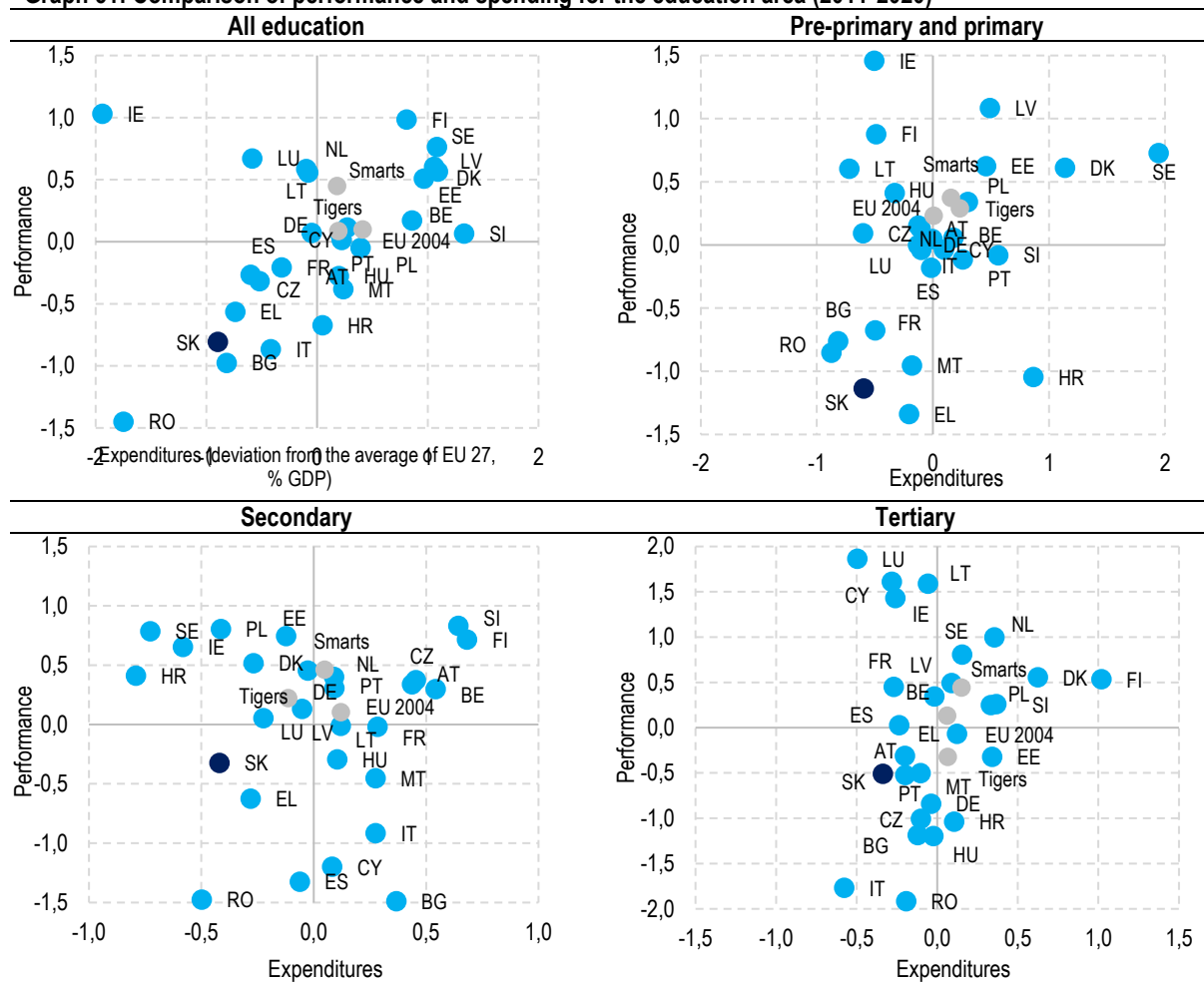
**Table 10: Composite indicators for the education area: normalised deviations from the EU 27 average**

Area	Number of KPIs	Slovakia	Tigers	Smarts	EU 2004
Pre-primary and primary	2	-1.14	0.29	0.37	0.23
Secondary	4	-0.32	0.22	0.46	0.10
Tertiary	1	-0.51	-0.33	0.44	0.13
Uncategorised	2	-1.26	0.16	0.52	-0.08
<b>Education</b>	<b>9</b>	<b>-0.81</b>	<b>0.08</b>	<b>0.45</b>	<b>0.10</b>

Source: VfMU's elaboration

A comparison of the performance and spending deviations ranks us among countries with low expenditures and poor results (fourth worst country for all education, second worst country for pre-primary and primary education). The countries with high spending and a better performance are in the upper right quadrant of Graph 51 (they include almost all Smart countries and the Baltic states from the EU 2004 group). Conversely, countries in the lower left quadrant are characterised by low spending and worse performance. Even in a breakdown into the sub-areas the position of Slovakia changes only very slightly and it still remains in the lower left quadrant.

**Graph 51: Comparison of performance and spending for the education area (2011-2020)**

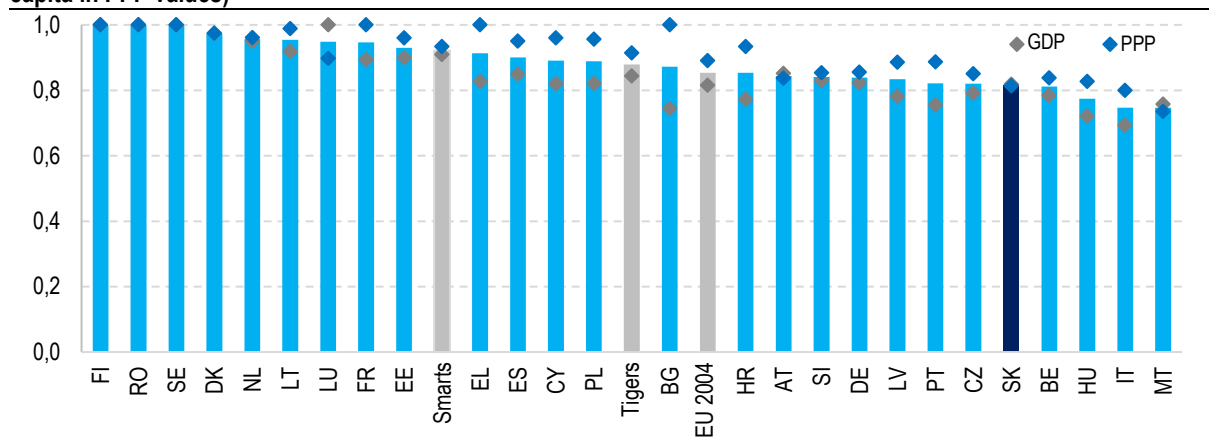


Source: Eurostat, OECD, TIMSS and PIRLS, processed by VfMU

**Slovakia's efficiency in education according to DEA (Box 5) is among the poorest in the EU overall, but differences between the countries are low and most of them are relatively efficient.** In order to improve results, it is, therefore, necessary not only to increase expenditures, but also to improve the efficiency of their use, especially in tertiary education. The most efficient countries are those achieving excellent outcomes (Sweden, Finland), as well as Romania whose performance is only slightly worse than that of Bulgaria or Slovakia despite an extremely

low level of spending. The DEA models calculated specifically for regional education and tertiary education indicate that Slovakia has the biggest efficiency problem in tertiary education (Annex 11).

**Graph 52: Efficiency in the education area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, OECD, TIMSS, PIRLS, processed by VFMU

## 2.5 Research and development: spending is low in both the public sector and the private sector

In recent years, Slovakia's public spending on research and development has been significantly lower than the Smart or Tiger countries and comparable to the EU 2004 countries. Private investments are also lagging behind, and with the overall spending amounting to half of that of the EU 26 and only a third of the Smart countries' expenditures, Slovakia is at the bottom end of all EU countries.

Slovakia's research and development performance is among the poorest in the EU and the rate of improvement is also below average. If the pace of progress does not increase, the gap in innovation performance will continue to widen. It is, at the same time, obvious that countries spending more public funds on research and development also achieve better results.

Since 2016, Slovakia's allocations of public funds to research and development, measured by COFOG, have been less than 0.6% of GDP. The average of the EU countries is almost 1.1%, and the average of the Smart countries is 1.5%.<sup>25</sup> Except for 2015 when allocations of EU funds from the previous programming period were drawn down, support for research and development has constantly been at a level below the average of the other reference groups. Since 2016, however, it has fallen even below the average of the EU 2004 countries, and it has rather stagnated or grown very slowly in recent years.

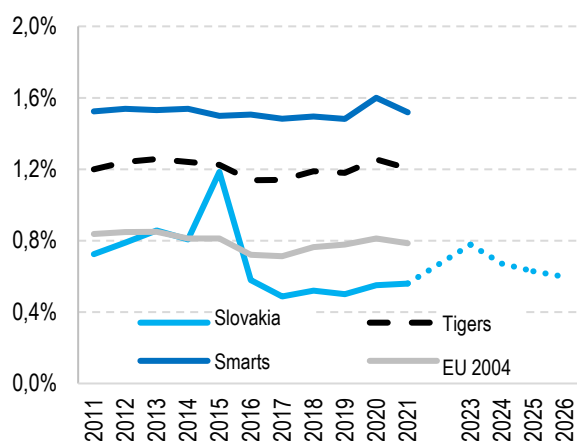
The GBARD<sup>26</sup> and GERD<sup>27</sup> data provide a more accurate classification of expenditures compared to the COFOG methodology. They reflect expenditures according to the Frascati Manual compiled by the OECD which clearly defines which activities constitute research and development. GERD statistics are sourced from the reports of entities implementing research, GBARD represents budgeted resources reported by state institutions. In addition to research and development expenditures, GBARD also includes institutional support for R&D, such as payments for membership in international scientific organisations, financing of access to scientific databases, etc., beyond the scope of GERD. Under the COFOG methodology, in contrast, the inclusion of expenditures is more liberal and it is also reflected in the size of expenditures relative to GDP.

<sup>25</sup> The EU average is the average of all EU countries without Slovakia.

<sup>26</sup> Government Budget Allocations for R&D

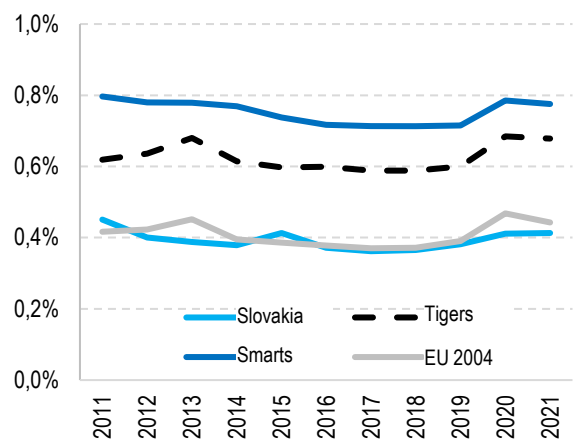
<sup>27</sup> Gross Domestic Expenditure on R&D

**Graph 53: Public expenditure on research and development (COFOG), % of GDP**



Source: Eurostat

**Graph 54: Public expenditure on research and development (GBARD), % of GDP**

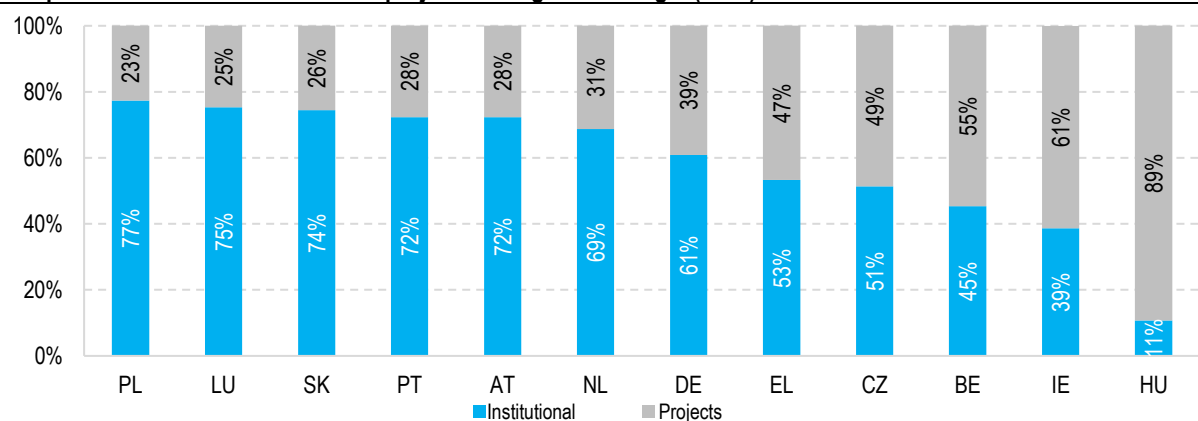


Source: Eurostat

The budgeted expenditure on research and development (GBARD) has been stagnant for 10 years around the value of 0.4% of GDP, similar to the EU 2004 countries. Since 2020, however, they also have moved slightly farther from Slovakia. In contrast, the average of the EU countries is between 0.5% and 0.6% of GDP, and the average of the Smart countries is between 0.7 and 0.8% of GDP.

Institutional (non-competitive) funding represents on average almost two-thirds of the total research and development funding in the EU, but almost three-quarters in Slovakia. The stability and predictability of research funding are important for research organisations to be able to focus on scientific research activities that often do not yield immediate returns. Institutional financing has, therefore, many advantages. However, the disadvantage is the need for additional mechanisms to control the relevance and quality of the outputs of the funded institutions.

**Graph 55: Share of institutional and project funding in the budget (2020)**

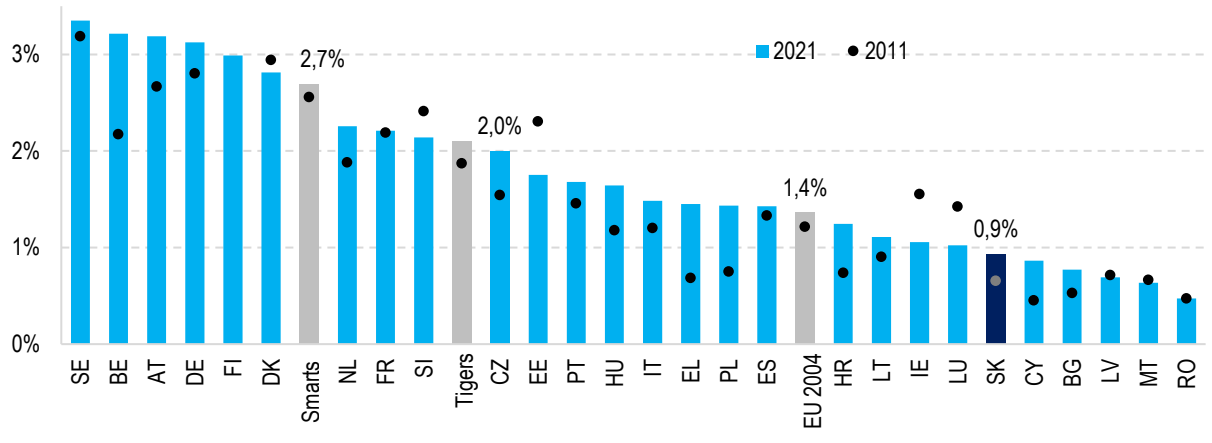


Source: Eurostat [GBA\_FUNDMOD], BIS

Research and development is financed not only from public funds: many companies also invest their resources and they make a significant portion of all funding in some countries. However, the total research and development expenditures, including private expenditures, are significantly below average in Slovakia when compared to the other EU countries. Organisations' expenditures from public and private sources (according to GERD) were worth EUR 918 million (0.9% of GDP) in 2021, which puts Slovakia at the bottom of the European ranking, the average of the EU countries and the Smart countries being 1.8% and up to 2.7% of GDP, respectively. The leading EU countries with the highest shares of R&D expenditures are almost at the level of the USA and Switzerland, which are the world's leaders with shares of 3.4% and 3.2%, respectively. Since 2011, the share of the total R&D spending in Slovakia has increased, but compared to countries with a similarly low share in

2011 (Greece, Croatia, Poland), this growth was lower. Since the adoption of the Lisbon Strategy of 2000, the level of 3% of GDP with two-thirds coming from private sources has been considered as the target value for the EU<sup>28</sup>. Slovakia is approaching those targets very slowly.

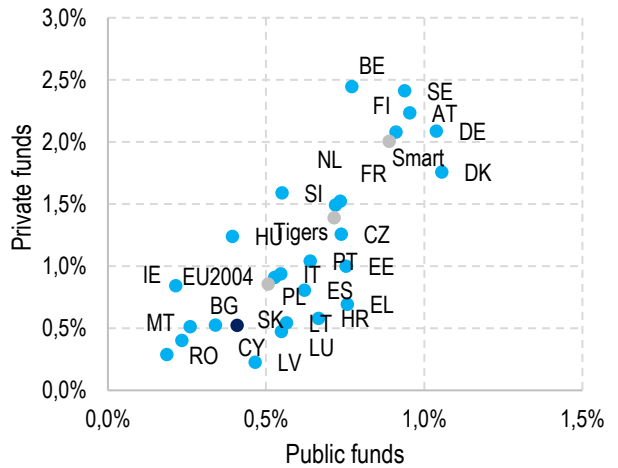
**Graph 56: Total research and development expenditures, % of GDP**



Source: Eurostat, [RD\_E\_GERDTOT]

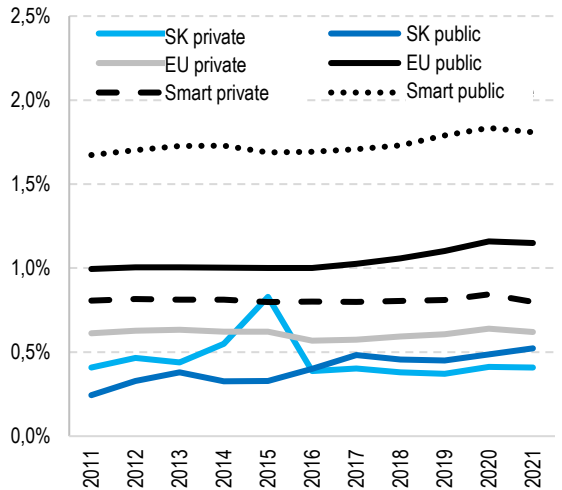
**Slovakia’s R&D expenditures as a share of GDP in the public sector have not grown but have doubled in the private sector over the past decade.** The expenditures of the private sector and the public sector are complementary: R&D spending in the public sector (government sector and universities) usually grows hand in hand with the private sector’s spending (Becker, 2014). In Slovakia, however, the public sector’s R&D spending as a share of GDP has stagnated, with the exception of 2015 when allocations of EU funds remaining from the previous programming period were drawn down. Business expenditures on R&D in Slovakia have doubled over the last decade from 0.24% of GDP to 0.52% of GDP.

**Graph 57: R&D expenditures in the public sector and the private sector (2020 ), % of GDP**



Source: Eurostat, [RD\_E\_GERDTOT]

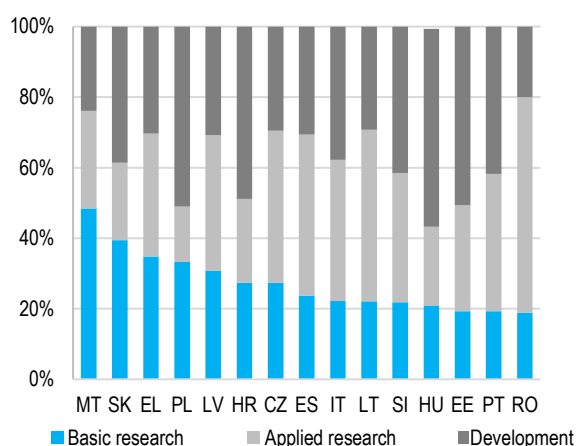
**Graph 58: R&D expenditures in the public sector and the private sector, % of GDP**



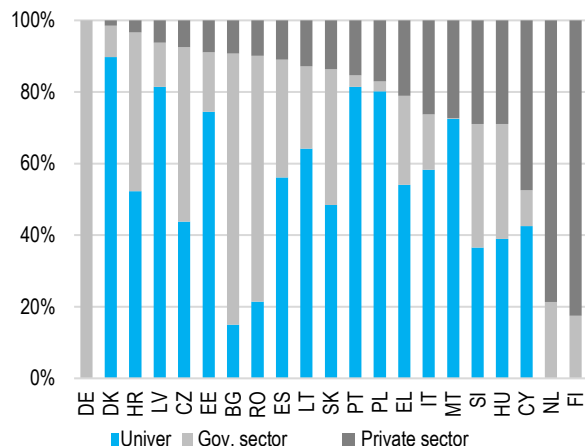
Source: Eurostat, [RD\_E\_GERDTOT]

<sup>28</sup> Pact of research and innovation in Europe, Council Recommendation.

**Graph 59: R&D expenditures by type of research (2020)**



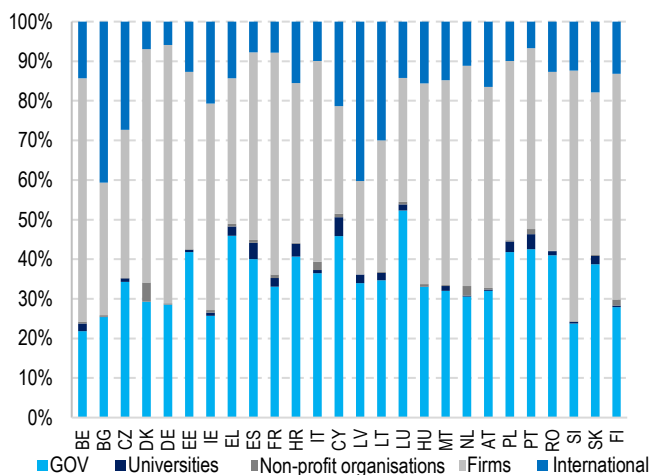
**Graph 60: Basic research by sector (2020)**



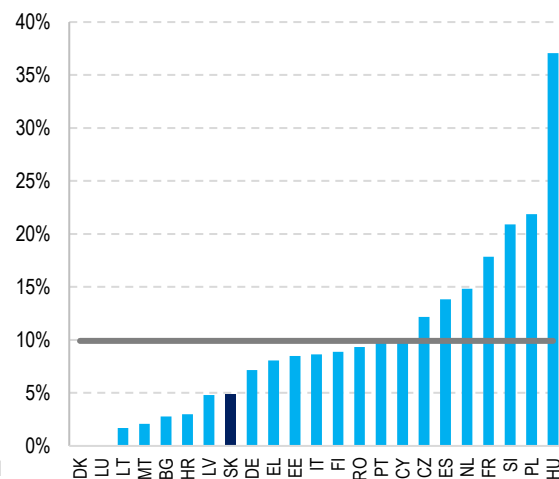
Note: Some countries do not make a distinction between basic and applied research and do not report basic research. Source: [RD\_E\_GERDACT]

The share of R&D expenditures financed from the state budget is above average in Slovakia, but the portion directed to the business sector is very low. In 2020, the Government's (i.e. state budget) funding for R&D accounted for 40% of the total R&D expenditures, while the EU 27 average was 30%. The state R&D funding provided to the business sector in Slovakia amounts to only 5%; in contrast, the average of the EU countries with available data is over 10%. The remaining public R&D funding goes to the university sector (EU average: 57%; Slovakia: 54%) and the government sector (EU average: 31%; Slovakia: 41%). The proportion provided to the private non-profit sector is on average less than 1%.

**Graph 61: Structure of research and development expenditures by source of financing (average of 2012 - 2020)**



**Graph 62: Proportions of state budgeted expenditures provided to the business sector's R&D (2020), in %**



Source: Eurostat, [RD\_E\_GERDFUND], [RD\_E\_FUNDGERD], [RD\_E\_GERDTOT]

### Research and development performance

The goal of research and development is innovations that elevate the competitiveness of companies, long-term economic growth and quality of life. Investments in research differ from other private investments in that they are subject to various market failures: high risk arising from an unclear outcome; unavailability of financing for high-risk projects; time lag between investment and results; and, in particular, inability to appropriate all benefits of research as the results are available to the whole society. These factors reduce the motivation of the private sector to spend the necessary amount that corresponds to the social benefit. This is why public support for research and development needs to be a part of public policies.

**Table 11: Overview of performance indicators for the R&D area (2020)**

Indicator	Slovakia	Tigers	Smarts	EU 2004
European innovation ranking score	65.2	92.4	124.4	78.3

Source: GGB 2023 - 2025

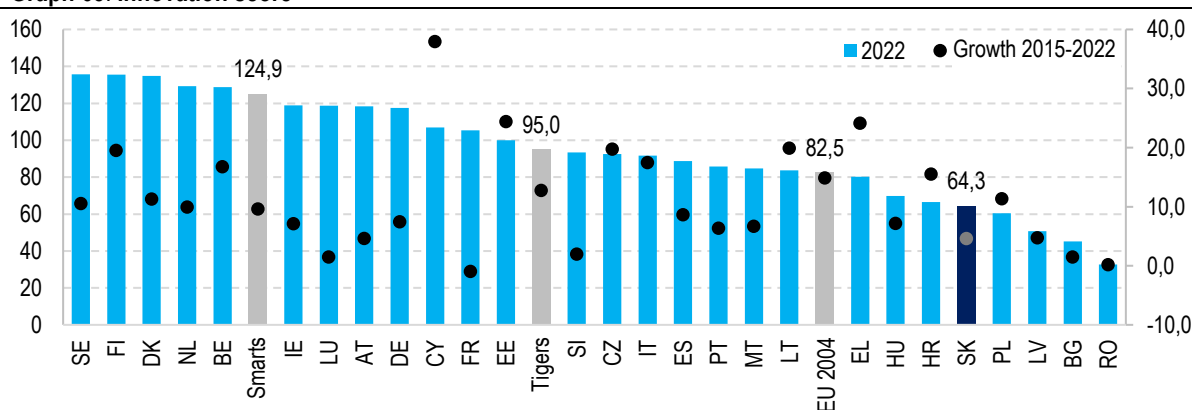
**The European Innovation Ranking (EIS) is a composite indicator used to measure research and development performance.** While economic growth and quality of life are the main goals of innovation, as such they are very general. In addition to the attainment of the general goals, research and development should primarily aim to support the overall innovation performance of the country. The latter can be monitored using the EIS indicator, which encompasses 32 sub-indicators covering 12 categories, such as human resources, the attractiveness of the research system or intellectual property. This study uses the EIS as the only performance indicator for research and development. Other potential indicators are already included in the EIS, and it makes no sense to monitor them separately.

**Table 12: Composite indicator for research and development**

Indicator	Number of KPIs	SK	Tigers	Smarts	EU 2004
European innovation ranking score	1	-0.93	0.01	1.11	-0.48

Source: Eurostat, processed by VIMU

**Graph 63: Innovation score**

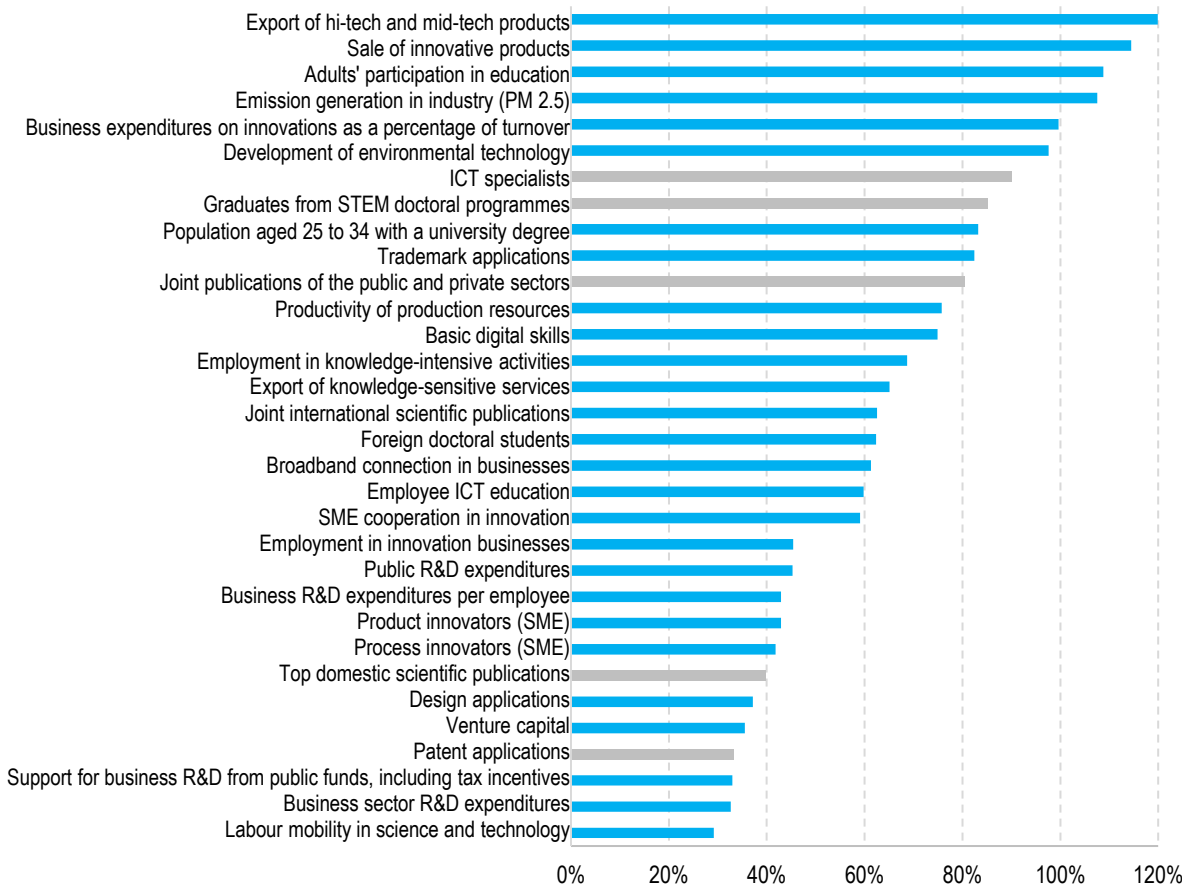


Source: EIS 2022

**According to the EIS, Slovakia is considered an emerging innovator.** It ranks among the least-performing countries and the rate of improvement of the composite indicator is below the average rate of the EU 27 countries. This means that if the pace of improvement does not increase, the gap in innovation performance will further widen. It is also true that the EU as a whole is not a world leader and, according to a global comparison in the EIS, it is overtaken by South Korea, Canada, the USA and Australia, and from the non-EU European countries by Switzerland, Norway, Great Britain and Iceland.

**To advance its innovation performance, Slovakia must improve in a number of indicators included in the EIS.** The cornerstone is basic research, including internationalisation as an element that is particularly or small countries like Slovakia with a small capacity to fully cover all scientific disciplines. However, Slovakia's score in joint international publications is only 70% of the EU average. The share of domestic scientific publications in the 10% of the most cited scientific publications worldwide reaches only 40% of the EU 27 average, despite the fact that the share of researchers working in the public sector, where the majority of basic research takes place, is one of the highest. At the same time, basic research is at the centre of Slovakia's research efforts: spending on it amounts to almost 40% of all expenditures, in contrast to the average of European countries of 25%.

**Graph 64: Slovakia's ranking in the individual indicators\* (2023), EU = 100%**



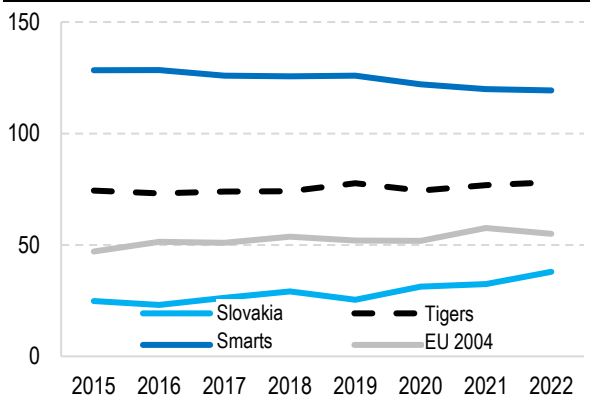
\* The indicators marked in grey have high correlation with the overall EIS (value of at least 0.8)

Source: EIS 2022

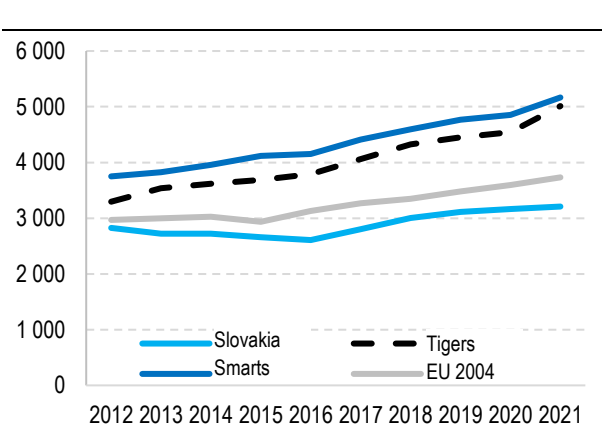
**The private and public sectors must cooperate in order for the subsequent transfer of knowledge from the academic to the business environment to be possible. In Slovakia, this process fails in several key points.**

According to the EIS, Slovakia lags most significantly in the state support for research and development in the business sector. Expert studies consistently confirm a positive impact of state support on the level of spending on research and development in the private sector<sup>29</sup>. The low support from public funds is probably also a factor in the significant gap in the business sector's R&D spending. When viewed in terms of the number of patents as a measure of the transfer of knowledge into practice, Slovakia is below 40% of the EU 27 average.

**Graph 65: Most cited publications, percentage of the EU average**



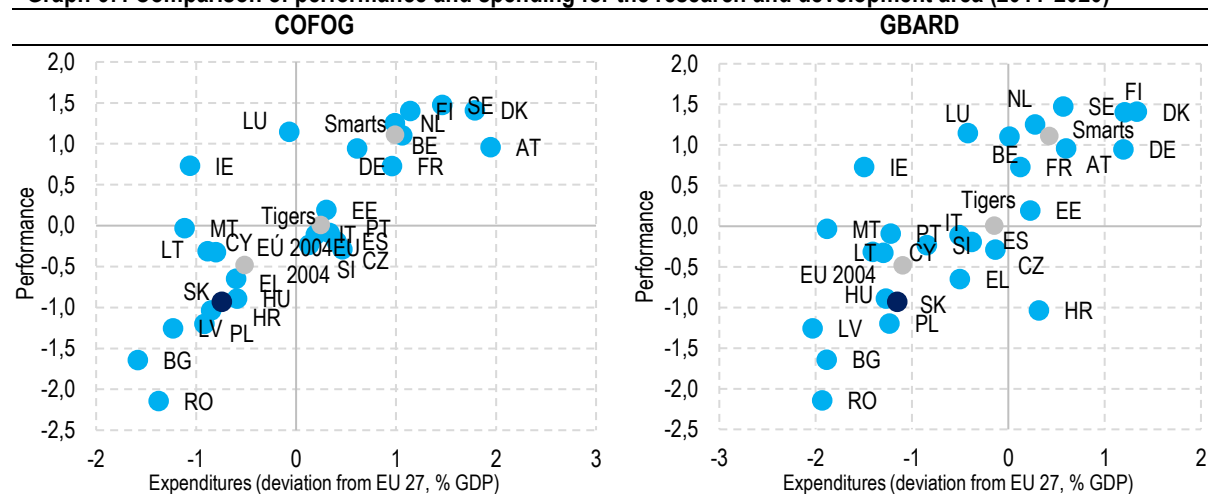
**Graph 66: Researchers per million of population**



29 For a quick insight, we recommend, for example, [Conte, Schweizer, Dierx and Ilzkovitz \(2009\)](#), prepared for the EC.

**Countries that spend more public resources on research and development achieve better results and vice versa.** Research and development products are associated with positive externalities. Investors are not able to obtain all social income from R&D, which reduces their motivation to engage in this field. Public funding plays a key role in the generation of these assets as it internalises a certain part of the gap between the benefit for the society and the benefit for the investor. While Graph 67 is not able to directly capture the causality, when supported by the results of empirical and theoretical studies, it suggests a reasonable assumption that more public spending on R&D actually helps countries achieve better results in this area.

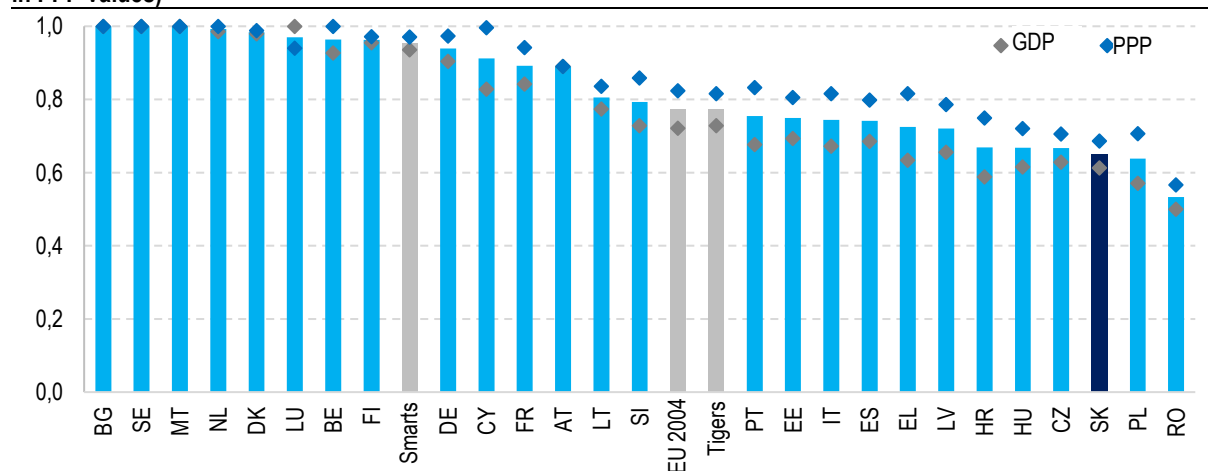
**Graph 67: Comparison of performance and spending for the research and development area (2011-2020)**



Source: Eurostat, EIS, processed by VfMU

**The spending efficiency according to DEA (Graph 68) is among the lowest in the EU.** The most efficient countries in research and development are the Smart countries, as well as Malta and Bulgaria, mainly because of their low expenditure in this area. Public spending on research and development in Slovakia is low and, at the same time, it may not be used in the best possible way, which may be due, for example, to a high level of institutional funding that does not necessarily support the highest quality of outputs, and this both in the public and the private sectors. Similarly, Slovakia also achieves low efficiency in DEA models that are based on GBARD or GERD instead of the COFOG methodology (Annex 11).

**Graph 68: Efficiency in the R&D area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



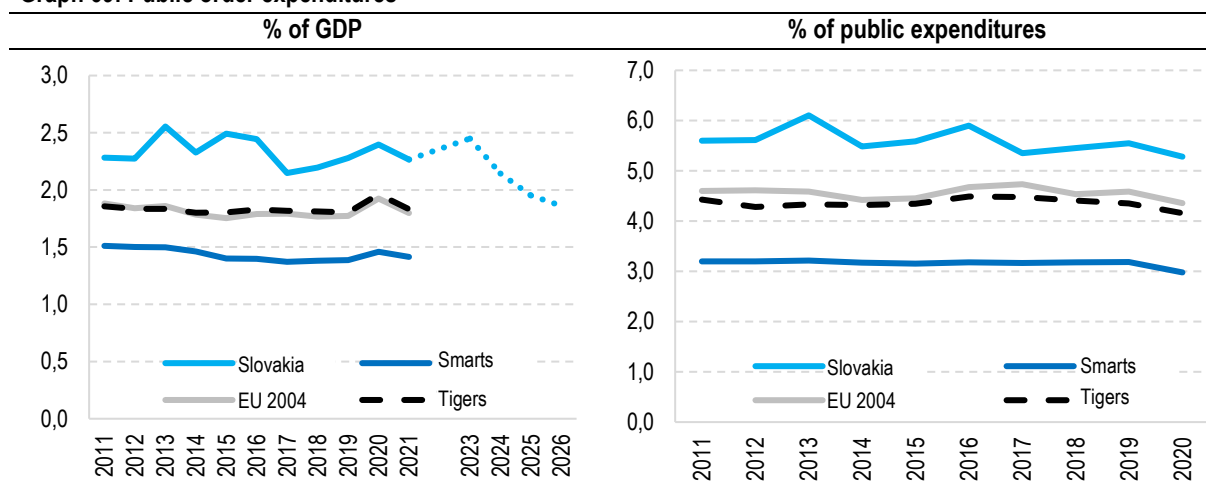
Source: Eurostat, EIS, processed by VfMU

## 2.6 Public order: more than rich countries, especially on the police

**Slovakia's spending on public order is similar to the neighbouring countries but above the reference groups. The biggest difference is with the police. We are among the worst performers in the EU with regard to the monitored performance indicators, but the causal link between spending and performance in the public order area is not strong and there are other factors, such as the standard of living, that play a significant role. As wealth increases, crime naturally declines, and spending on public order (expressed as a % of GDP) should also gradually decrease.**

Within the V4, our spending on public order is comparable, but compared to the main reference groups, it is consistently higher both as a % of GDP and as a % of all public spending (Graph 69). The most significant difference is in the Smart countries, compared to which we spend 1.5 to 2 times more. Public order includes the sub-areas of police, fire protection, judiciary, prisons, and the sub-area of order activities not elsewhere classified. According to a regression model that takes into account the country's wealth, crime rate, long-term unemployment rate, and demographics, we spend 0.3% of GDP more on the public sector than the EU countries (Box 3, Annex 10).

**Graph 69: Public order expenditures**



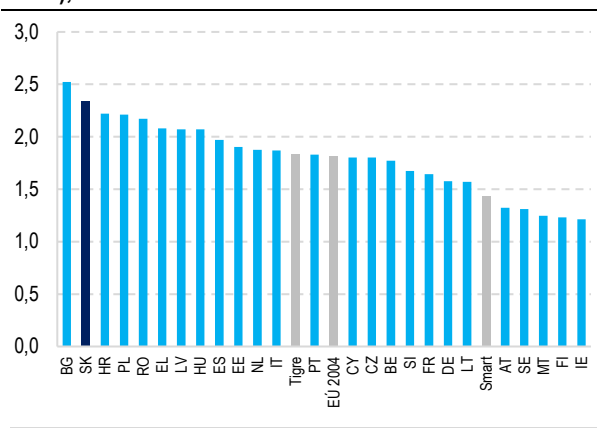
Source: Eurostat

**In the EU, the Balkan countries in particular have a similarly high spending on public order.** Compared to Slovakia (2.3% of GDP), only Bulgaria (2.5% of GDP) has higher expenditures in this area. Croatia, Romania, and Poland spend 2.2% of GDP and all reference groups are below 2% of GDP.

**The level of public capital in the public order area in Slovakia is high when compared to the average of the reference groups, and this is mainly because of long-term high investments (Graph 71).** Capital expenditures in the years 2011 - 2020 included mainly the purchase of information systems (EUR 686 million<sup>30</sup>), the purchase and renewal of fire-fighting equipment (EUR 180 million), government aircraft (EUR 98 million), police vehicles (EUR 94 million), but also the renovation of fire stations (EUR 47 million).

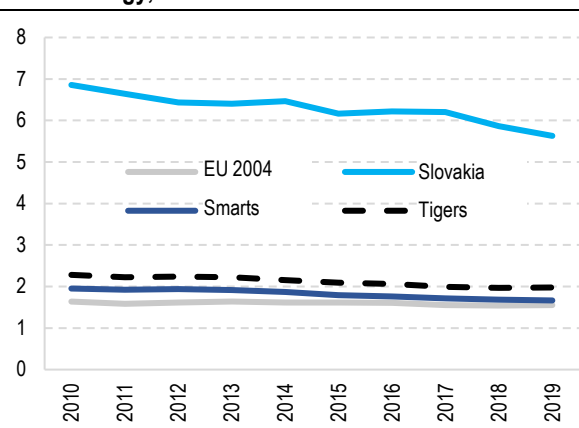
<sup>30</sup> Project examples may include the Police information systems (EUR 53 million), Implementation of the Electronic Identification Card (EUR 37 million), Electronic Services of the Ministry of the Interior of the Slovak Republic in the Public Order, Security and Property Areas (EUR 37 million), Vehicle Registration IS Upgrade (EUR 29 million), Electronic Police Services of the Information Systems of the Ministry of the Interior (EUR 28 million), Integrated Information System (EUR 27 million), Development of Electronic Judicial Services (EUR 27 million), Accused and Convict Electronic Monitoring Services (ESMO) (EUR 26 million), etc.

**Graph 70: Public order expenditures (average of 2011-2020), % of GDP**



Source: Eurostat

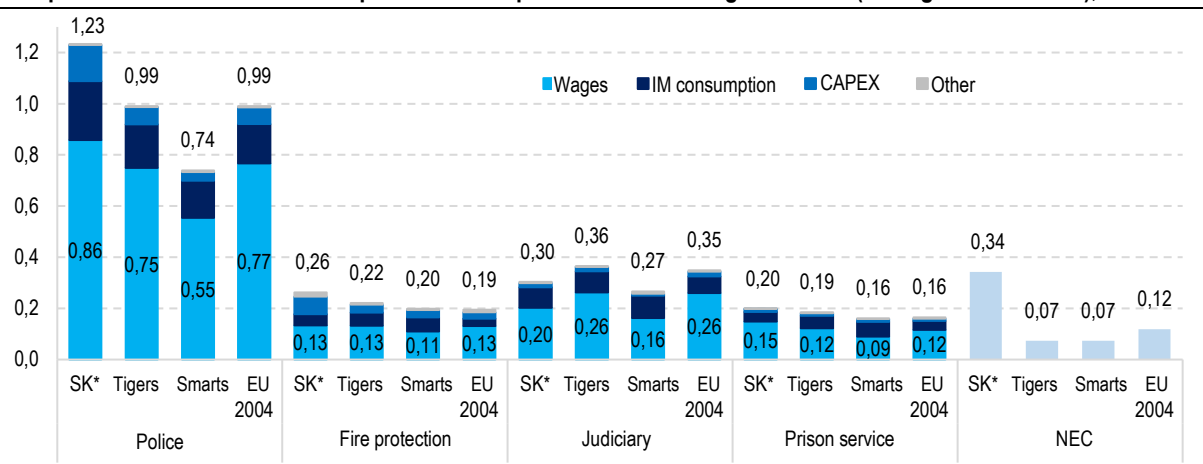
**Graph 71: Public capital in public order, IMF methodology, % of GDP<sup>31</sup>**



Source: IMF

Compared to the reference groups, we spend more on police services and, to a lesser extent, on fire protection (Graph 72). The level of funding in the judiciary and prison system area is similar. Police services include, in addition to state police departments (83% of the expenditures), customs offices (9%) and municipal police departments (8%). NEC expenditures, which include, for example, the prosecution service or intelligence service, are significantly higher in Slovakia, which is likely to be due to a different approach to the reporting of some multi-purpose expenditures. The Ministry of the Interior of the Slovak Republic often includes in this category funds that are budgeted centrally, but pertain to a range of areas, such as a police car that is transferred to a District Authority after a few years.

**Graph 72: Structure of Slovakia's public order expenditures according to COFOG (average of 2011-2020), % of GDP**



\* Estimate based on the Budgetary Information System (BIS).  
 Note: NEC expenditures adjusted using BIS cannot reliably be classified according to ESA.

Source: Eurostat, RIS, VMU's estimate

The structure of the Slovak budget most differs from those of the other countries with regard to investments in the police and fire protection areas, where expenditures are two to three times higher than in the Smart countries. Among all combinations of the COFOG groups and the ESA categories, Slovakia spends relatively less in comparison to the Smart countries only on intermediate consumption (goods, services and ordinary transfers) in the sub-areas of fire protection, judiciary and prisons. For all reference groups, the largest expenditure item in all sub-areas of public order is employee compensations.

<sup>31</sup> Public capital calculated according to the IMF methodology expresses the value of physical assets (for example, cars, government aircraft, the value of information systems, etc.) as the accumulated discounted value of public investments (fixed capital formation).

## Public order performance

The informative capacity of the performance indicators for the public order area is lower than the other areas. Several indicators are affected by economic, social or cultural factors that do not fall under the public order sector. Examples may include the impact of infrastructure quality on the number of road traffic fatalities, the impact of the population's standard of living on the number of intentional homicides, or the impact of the legal environment on the number of prisoners. Moreover, four of the seven indicators are of a subjective nature.

A comparison of the individual indicators indicates a low level of the Slovak population's trust in the police and the judiciary, and a high number of prisoners in the Slovak prisons (Table 13). For the number of road traffic fatalities and number of intentional homicides as other indicators of police service, Slovakia is at par with the EU average. Quantifiable indicators for fire protection are not available.

**Table 13: Overview of performance indicators for the R&D area (2020)**

Area	Indicator	Slovakia	Tigers	Smarts	EU 2004
Police	Road traffic fatalities per 100,000 of population	4.6	4.2	3.7	5.0
Police	Number of intentional homicides per 100 thousand of population (five-year moving average)	1.3	1.1	1.0	1.8
Police	Trust in police (% of population)	45	75	83	67
Police	Feelings of safety when walking alone at night (% of population)	65	72	78	69
Judiciary	Perception of independence of judiciary by businesses (% of positive responses)	15	47	75	42
Judiciary	Perception of independence of judiciary by population (% of positive responses)	26	57	76	49
Prison service	Number of prisoners per 100,000 of population	193	138	76	162

Source: Eurostat, OECD

Slovakia is among the worst performers in the EU when it comes to the monitored performance indicators. Especially the countries of the former Eastern bloc, with the exception of Slovenia, perform below average. The position of the East European countries is worsened mainly by the low level of trust in the police and judicial authorities, which are similar to the South European countries. The Baltic countries stand out negatively when it comes to the number of murders and, together with the V4, also the number of prisoners.

**Table 14: Composite indicators for the public order area: normalised deviations from the EU 27 average**

Area	Number of KPIs	Slovakia	Tigers	Smarts	EU 2004
Police	3	-0.66	0.20	0.59	-0.38
Judiciary	2	-1.73	-0.11	1.10	-0.43
Prison service	1	-1.73	-0.53	0.86	-1.06
<b>Public order</b>	<b>6</b>	<b>-1.37</b>	<b>-0.15</b>	<b>0.85</b>	<b>-0.61</b>

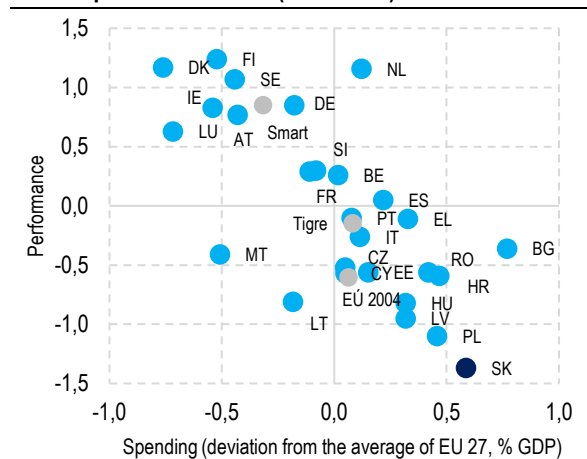
Source: Eurostat, processed by VřFMU

The causal link between spending and performance in the public order area is not strong and there are other factors, such as the standard of living, that play a significant role here, too. Countries with higher spending levels perform worse and vice versa (Graph 73). However, given the lower informative capacity of the results in this area and the strong effect of non-sectoral factors, this does not mean that the financing of public order is in vain.

As wealth grows, crime naturally declines, and spending on public order expressed as a % of GDP should gradually decrease, too, but in Slovakia this % remains constant. Countries with a higher GDP per capita spend a lower percentage of GDP on public order than poorer countries but achieve better results (Graph 74 ). Higher wealth is normally associated with lower levels of crime and a change in public policy priorities in favour of the education, health, research and development, or social areas, which thus receive a higher share of the budget. Despite the fact that Slovakia's real GDP per capita has increased by 22% and crime has decreased by 40% over

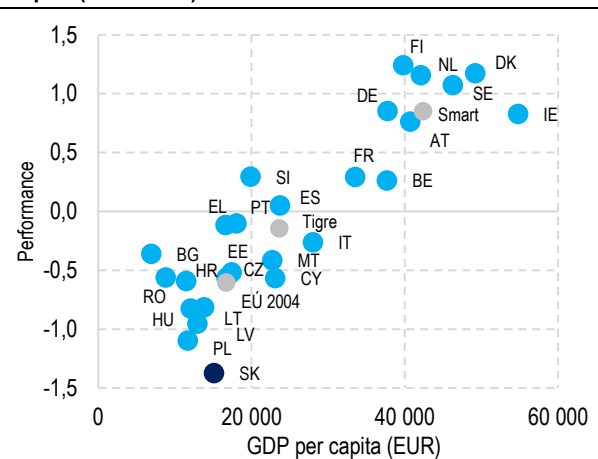
the last 10 years, spending on public order has grown at a similar rate as the total general government spending. This topic is covered in more detail in the Update of the Spending Review of the Ministry of Interior of the Slovak Republic ([VfMD, 2023](#)).

**Graph 73: Comparison of performance and spending for the public order area (2011-2020)**



Source: Eurostat, OECD, processed by VfMU

**Graph 74: Public policy performance related to GDP per capita (2011-2020)**



Source: Eurostat, OECD, processed by VfMU

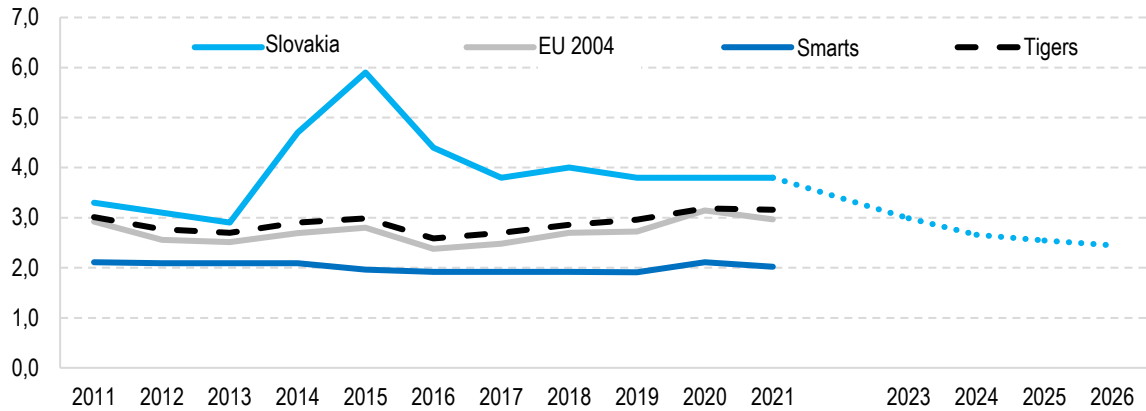
## 2.7 Transport: more than the most developed countries, not only because of the lack of infrastructure

Slovakia has long been spending more on transport than the Smart or Tiger countries, which can partly be explained by a high investment gap in infrastructure. However, there are also big differences in the operation and maintenance of the infrastructure (roads, railways) and in the salaries of employees of state transport companies (high personnel costs are mainly due to high numbers of employees, for example, in the state railway companies, ŽSR and ZSSK).

The amount of public capital in transport increased more significantly after 2016, mainly because of the drawing down of remaining allocations from the EU's Structural Funds. As regards physical infrastructure (for example, the density of motorways), Slovakia's performance is about at par with similar countries but has not markedly approached the Smart countries, or improved more than the Tigers. The root cause may be the low efficiency of the individual investment projects.

Between 2011 and 2020, Slovakia was spending on transport approximately EUR 3.3 billion (4% of GDP) per year, which is about 1.3% of GDP more than the EU 2004 average and almost double the average of developed countries. The increase in expenditures in 2015 was mainly due to the drawing down of the allocations of EU funds remaining from the ending programming period. The specific allocations to the individual areas, such as transport, for the years 2024-2026 are not known yet.

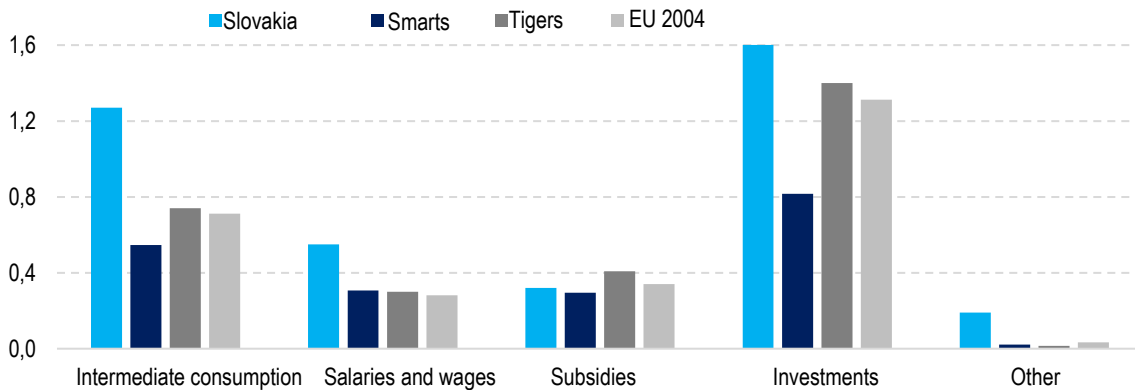
**Graph 75: Public expenditures on transport, % of GDP**



Source: Eurostat

The higher expenditures are attributable not only to investments: we also spend more on salaries and operations. We spend almost twice as much on salaries as each of the reference groups. It is probably not due to high salaries but rather to a high number of employees in the sector, or low labour productivity compared to the other countries (Box 8). While the intermediate consumption expenditures were stable in the monitored period<sup>32</sup>, employee compensations were constantly increasing. Subsidies (to transport companies, for example) are approximately at the level of the reference groups of countries. The increase in investment expenditures was mainly due to the construction of motorways.

**Graph 76: Transport expenditures according to the COFOG groups and the ESA classification (average of 2011-2020), % of GDP**



Source: Eurostat

**Box 8: There is a potential for operational savings in the railway companies**

In 2019 and 2021, performance audits of ŽSR and ZSSK were carried out, which recommended several measures aiming to reduce the costs and increase the productivity of the companies.

**ŽSR (Železnice slovenskej republiky, the Slovak National Railway Company)**

The audit identified saving measures amounting to EUR 77 million per year. According to the findings of the audit, labour productivity lags behind other countries and personnel costs make up 61% of total costs, and their proportion is constantly rising.

<sup>32</sup> It is not possible to clearly identify from the available budget data what causes the high intermediate consumption expenditures. Approximately EUR 120 - 200 million per year were payments for PPP projects, which may be a factor contributing to the increased expenditures. A part of the increased expenditures may also be due to a relatively higher share of outsourced maintenance or lower efficiency of in-house maintenance. Another "book" expenditure item increasing the spending can be the purchase of electricity by ŽSR for resale to railway carriers (EUR 100 million per year).

**For a part of maintenance personnel, more than 30% of their working time is spent on non-productive activities such as preparation, moving and waiting.** The productivity of employees and machines can be increased by modifying the length of shifts and planning shut-downs. This could help to improve the productivity of personnel by up to 20% (EUR 15.3 million) and of machines by up to 100%.

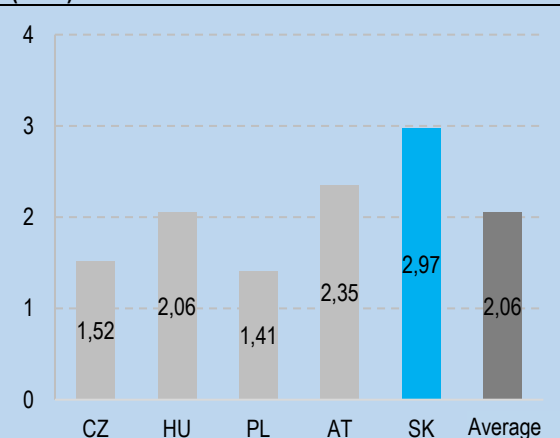
**ŽSR has a number of employees that is disproportionately high given the length of the tracks (Graph 77). It is necessary to continue the automation efforts in the medium term and take action to improve labour productivity in the context of retirement.** In particular, measures in traffic management (automation) have the potential to reduce the number of jobs in the near future. On the contrary, a shortage of employees can be expected in the areas of maintenance and administration.

**By reducing the management levels and centralising operations, it is possible to reduce the number of senior employees by approximately 38% (234 employees).** It is also possible to streamline administrative processes and reduce the office staff by 62. A shift to a vertical management pattern similar to those implemented at the electricity (SEPS) and gas (SPP-D) state companies is proposed. Also, the optimisation of logistics could lead to a cost reduction of more than EUR 3 million.

### ZSSK (*Železničná spoločnosť Slovensko*, the Slovak National Rail Transport Company)

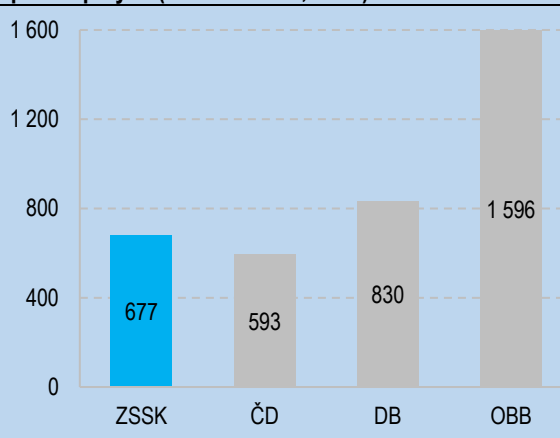
**The audit of ZSSK identified efficiency improvement measures with a long-term potential of EUR 109-130 million.** Out of that, measures for higher cost efficiency amount to EUR 94 million and measures for higher revenues from transport to EUR 15-36 million. Compared to the Czech railway company (ČD), ZSSK achieves slightly higher productivity per passenger-kilometre (pkm), but 30% lower productivity per train kilometre (tkm). The labour productivity of train conductors is a third lower than that of the Czech railway company. It is possible to save 101 employees in administration and management. Automation and digitisation of ticket sales would lead to the stabilisation of personnel expenses (savings of EUR 13 million). This is conditional on a high-return investment in new sales systems.

**Graph 77: Employees/track kilometres, state budget (2019)**



Source: Audit of ŽSR (2019)

**Graph 78: Average number of passenger-kilometres per employee (in thousands, 2020)**

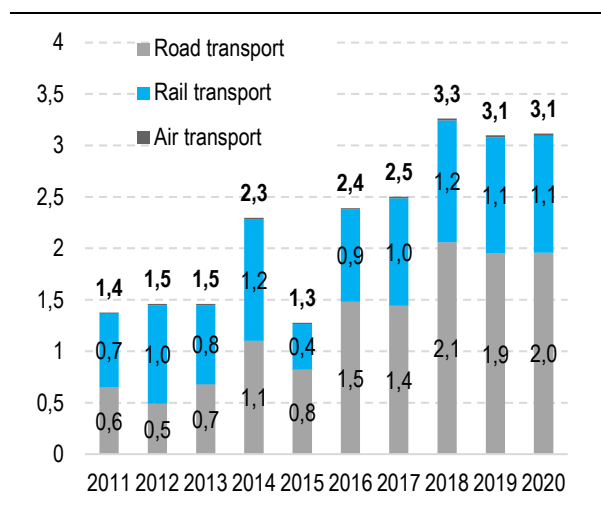


Source: Audit of ZSSK (2020)

**For a long time, a major part of Slovak transport expenditures has been directed to road and rail transport.** For road transport, the funding was mainly destined for the construction of motorways (*Národná diaľničná spoločnosť*, the national motorway management company (NDS)), the construction and maintenance of class I roads (*Slovenská správa ciest*, the national road management company (SSC)), or payments for public-private partnerships (PPP). For railway transport, the majority of the spending was on services, transfers and wages. Due

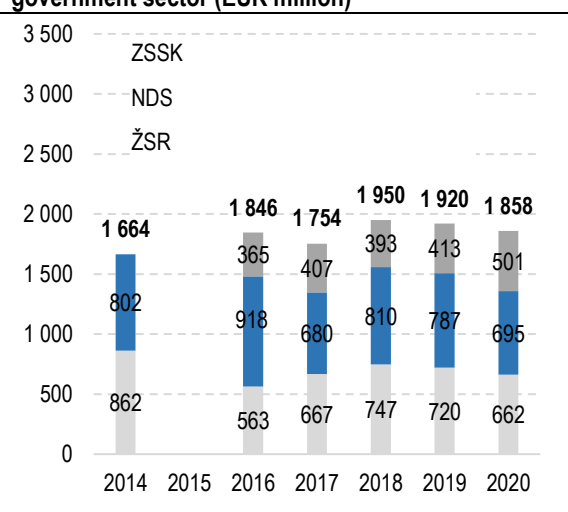
to the unavailability of a more detailed breakdown of transport expenditures for the European countries, a relevant comparison is not yet possible<sup>33</sup>.

**Graph 79: Public expenditures on transport by mode (EUR billion)**



Source: BIS

**Graph 80: Expenditures of selected organisations of the Ministry of Transport and Construction of the Slovak Republic after their inclusion in the general government sector (EUR million)**



Source: BIS

## Transport performance

**Despite significantly higher expenditures, Slovakia achieves only slightly above-average performance in transport. The results for the individual sub-areas, such as rail and road transport, are mixed.** While, for example, Slovakia achieves relatively good results in the proportion of public transport and emissions, we are slightly behind in terms of the number of train transport passengers, the density of motorways, or the share of electrified tracks. Data on the amount of expenditures are available only for the transport as a whole, and it is impossible to break them down by road, rail or other modes of transport.

**Table 15: Comparison of indicators between the groups of selected countries (2020)**

Area	Indicator	Slovakia	Tigers	Smarts	EU 2004
Rail	Passengers in train transport (passenger-kilometres/inhabitant/year)*	726	913	1,137	411
Multiple modes of transport	Share of public passenger transport in the total number of transported persons in national and international transport (%)*	26.2	20.6	18.0	18.7
Multiple modes of transport	Pollutant emissions from transport (% of 2000 value, NOx)*	66.9	77.3	59.2	98.3
Rail	Electrified tracks (%)	44	48	57	31
Road	Motorway density (km per thousand of km <sup>2</sup> )	16.7	16.9	24.6	13.7

\* Data for 2019, as the COVID pandemic has had a dramatic impact on mobility

Source: Eurostat

**Table 16: Composite indicators for transport**

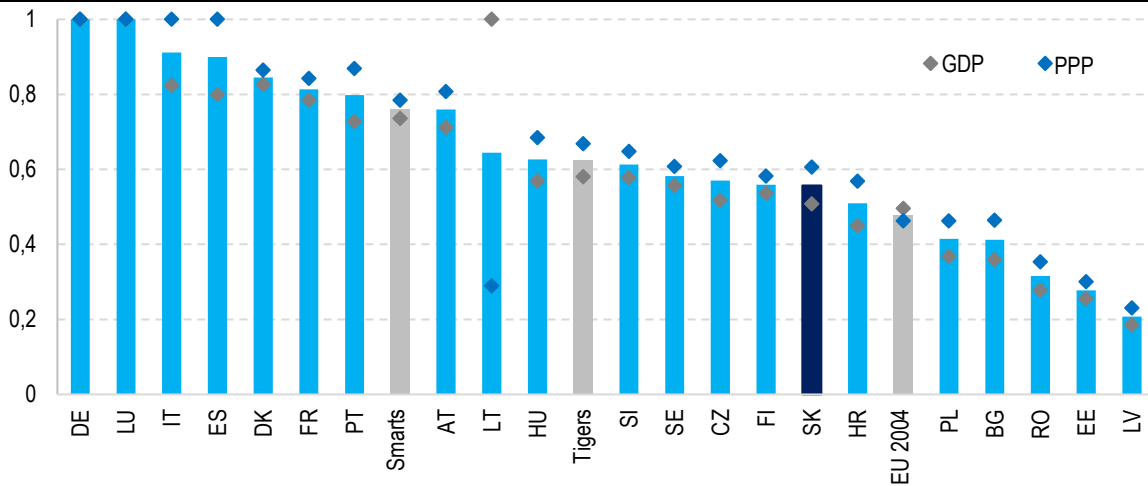
Area	Number of KPIs	Slovakia	Tigers	Smarts	EU 2004
Rail transport	2	-0.08	0.23	0.69	-0.62
Road transport	1	-0.21	-0.20	0.25	-0.47
Multiple modes of transport	2	0.99	0.20	0.40	-0.35
<b>Transport</b>	<b>5</b>	<b>0.23</b>	<b>0.08</b>	<b>0.46</b>	<b>-0.45</b>

Source: Eurostat, processed by VfMU

<sup>33</sup>At the same time, several state transport companies (NDS, ZSSK) were not a part of the general government sector before 2014 or 2016 and, therefore, not all of their expenditures were included in the general government budget. In addition, it is often not possible to fully reflect the differences in the categorisation of similar companies in the public transport sector by countries (there is no motorway company in the general government sector in Austria).



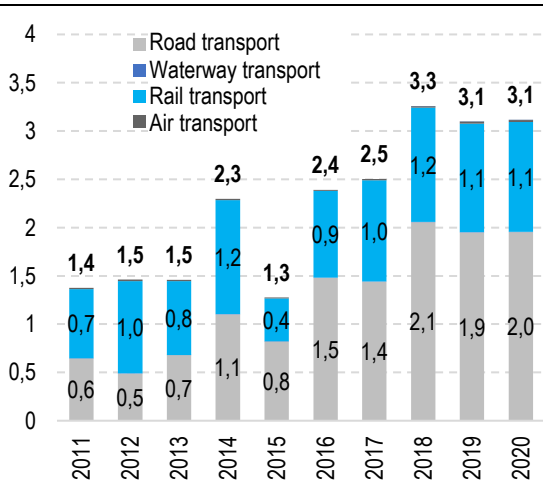
**Graph 82: Efficiency in the transport area according to DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, IMF, processed by VřMU

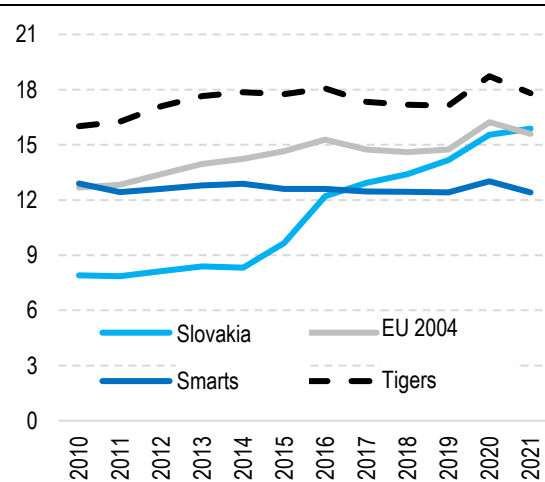
**The increased expenditure on investments in transport is only slowly reflected in the equipment and scope of the infrastructure. The low efficiency is also confirmed by the low economic return on the investment projects.** For a majority of the transport investment projects evaluated by the Ministry of Finance of the Slovak Republic, the economic value barely exceeded their costs, the ratio of benefits and costs reached only 1.38 on average. The reason for the high costs and low benefits are often oversized structures that are designed to accommodate a much higher traffic density than can reasonably be expected. It is necessary to improve the efficiency of investment projects in transport by building infrastructure of an adequate size and where it has the greatest benefit. An example can be city bypasses which cost less than half the price of full-profile motorways and, at the same time, can often bring similar time-saving benefits. High benefits can also be derived from relatively less costly upgrades of the existing sections of class I roads.

**Graph 83: Investments in transport by type, EUR billion**



Source: BIS

**Graph 84: Public capital - transport, % of GDP<sup>34</sup>**



Source: IMF, Eurostat, VřMU's calculations

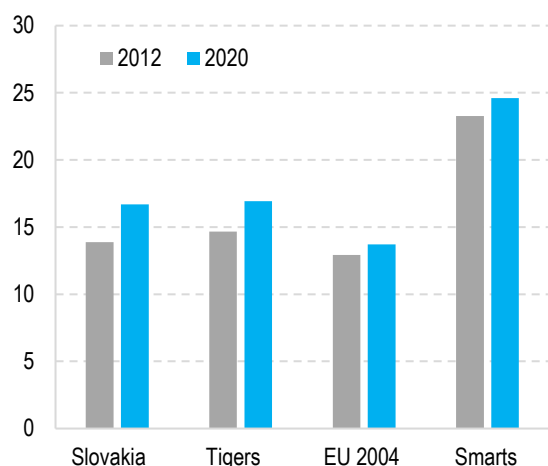
**Despite the comparable amount of public capital in transport (in % of GDP), Slovakia still gets less physical infrastructure compared to the Smart countries.** The public capital in transport<sup>35</sup> reaches approximately the

<sup>34</sup> Public capital calculated according to the IMF methodology expresses the value of physical assets/structure (for example motorways, bridges, etc.) as the accumulated discounted value of public investments (fixed capital formation).

<sup>35</sup> The transport public capital data were calculated using the IMF methodology from the public capital figures for the "economic area" (IMF) and the Eurostat's transport expenditure data. The underlying assumption is that approximately 70% of the expenditures on the "economic area" go to transport (based on Slovakia's historical data).

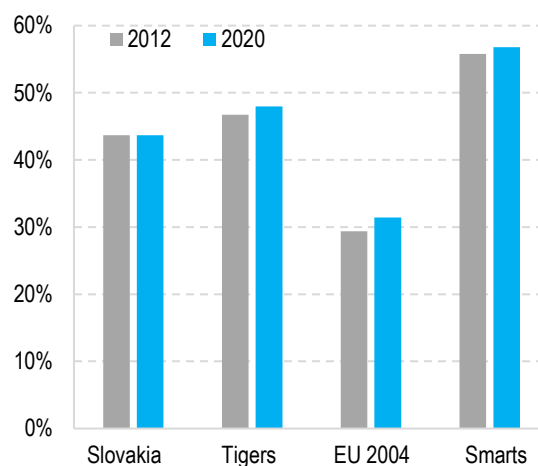
level of the EU 2004 countries and this was achieved mainly thanks to the absorption of large investments in transport projects from the ending programming period of the European funds in 2016. Approximately half of the investment spending in transport was on the construction of motorways (NDS). In rail transport, the expenditures were directed mainly to the modernisation of railway tracks (ŽSR). In the period reviewed, Slovakia managed to make progress mainly in the density of motorways, although it still does not reach the level of the Smart countries. The proportion of electrified railway tracks has not changed.

**Graph 85: Motorway density, km per thousand of km<sup>2</sup>**



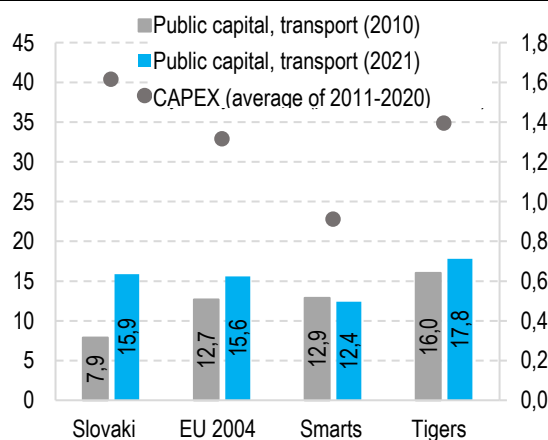
Source: Eurostat

**Graph 86: Electrified tracks, in %**



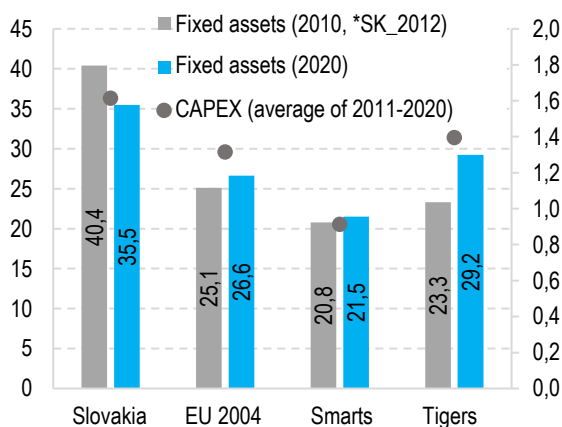
Source: Eurostat

**Graph 87: Public capital in transport and transport expenditures (average of 2010-2021), % of GDP**



Source: IMF

**Graph 88: Public capital in transport and transport expenditures - right axis (average of 2010-2021), % of GDP**



Source: Eurostat

\* The "other structures" category mainly includes structures other than buildings and other infrastructure, such as roads, sewers, dams, streets, etc.

## 2.8 General government salaries and wages: expenditures and numbers are comparable, the challenge is their structure

Slovakia spends on average 9.3% of GDP per year on general government salaries. The total number of general government employees is currently approximately 435,000. One third<sup>36</sup> of that are school employees, the second largest group are municipal employees and 11% are people working in the health sector. The average spending on wages as a percentage of GDP is higher in the EU 2004 group (10.8%),

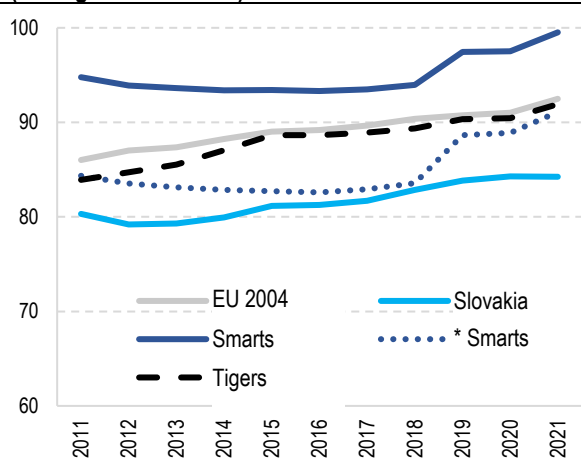
<sup>36</sup> This includes not only the central government but also local governments, enterprises run by them and social security and public health insurance funds.

the Smart group (11.4%) as well as the Tiger group (10.3%). However, these groups of countries also have a higher number of public employees. In terms of professions, Slovakia pays less than the Smart countries to social workers (social protection and old age), regional school and university teachers (education) and doctors and nurses (healthcare). Higher expenditure on salaries compared to the Smart countries is in the public order, transport, defence and state governance areas.

In Slovakia, an average of 81.4 employees per 1,000 inhabitants work in the public sector, and an average of 9.3% of GDP per year goes to their salaries. A country's number of public employees can be partially explained by the range of services that the country provides to its citizens. The slightly lower employment in the public sector in Slovakia is probably also related to the above-average level of supply of public goods (for example, in healthcare, transport or construction). The largest number of general government employees are in the Scandinavian countries, which belong to the Smart group. Italy, Germany and the Netherlands, in contrast, have the lowest numbers of civil servants. These differences within the Smart group affect its average (94.5 employees per 1,000 inhabitants). When the outliers are disregarded, Slovakia's number of general government employees is approximately the same as that of the adjusted Smart group<sup>37</sup> (\*Smarts: 84.3 vs. SK: 81.4 employees per 1,000 of the population).

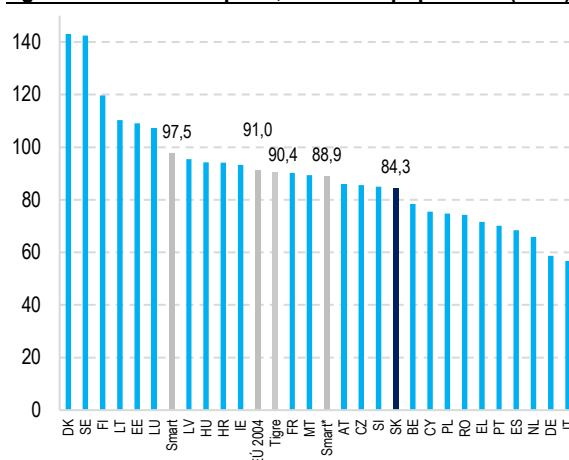
The number of employees in the Slovak public sector has changed only slightly over time: since 2011, this number has increased from 80.3 to 84.3 employees per 1,000 inhabitants, which means approximately 27,000 employees. They, however, do not necessarily to be new hires, but the increase may result from the re-categorisation<sup>38</sup> of some subjects into the general government sector. The other countries (Smarts, Tigers and EU 2004) have also slightly increased their numbers of public employees since 2018.

**Graph 89: Development of the number of general government employees per 1,000 of population (average of 2011-2020)**



\*Smart countries without Sweden, Denmark and Germany  
Source: Eurostat

**Graph 90: Number of employees in the general government sector per 1,000 of the population (2020)**



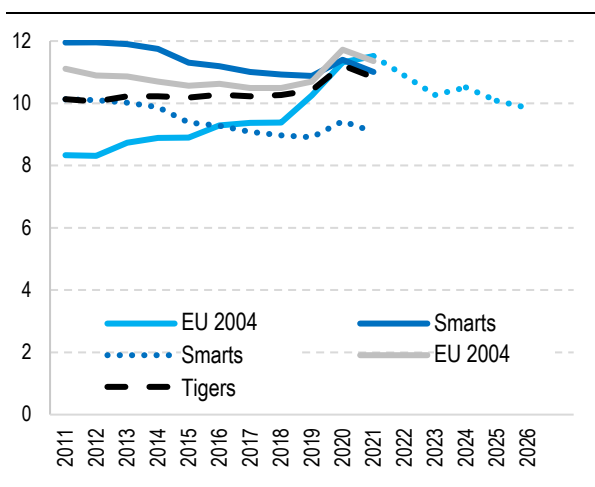
\*Smart countries without Sweden, Denmark and Germany  
Source: Eurostat

Despite the lower number of employees compared to the Smart countries, Slovakia's spending on salaries in recent years is about the same (SK: 11.3% vs. Smarts: 11.4% of GDP in 2020). In ten years, Slovakia has caught up with the Smart countries and the average of the Tigers in terms of expenditures on salaries. It has even surpassed the Smart countries' spending as a proportion of total expenditures. This is influenced by other public expenditures, the priority areas of the government and the overall distribution of public expenditures.

<sup>37</sup> The numbers of public employees in the Smart countries vary. The group includes the countries with the highest numbers of employees per 1,000 inhabitants in Europe (Denmark 143.1 or Sweden 142.4) but also with the lowest (Germany 58.7). The \*Smart group of countries is considered in this Chapter without Sweden, Denmark and Germany.

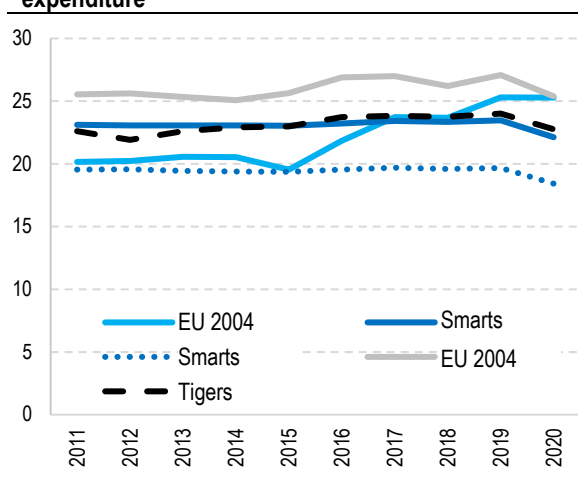
<sup>38</sup> A significant increase in the number of general government employees resulted from the inclusion of ŽSR and ZSSK into the sector in 2014 and 2016, respectively.

**Graph 91: Development of employee compensations in the GG sector (average of 2011-2020), % of GDP**



Source: Eurostat, Government finance statistics

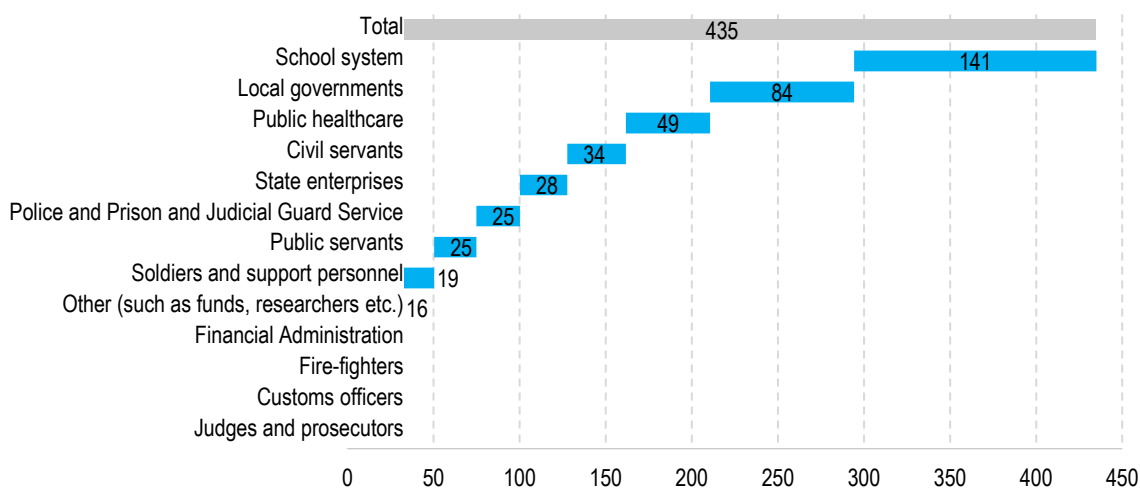
**Graph 92: Development of employee compensations in the GG sector (average of 2011-2020), % of public expenditure**



Source: Eurostat, national accounts, demographic statistics

The largest professional group in general government are teaching and non-teaching employees of the education system who make up a third of all employees (141 thousand). Employees of healthcare facilities represent 11% (49 thousand), and 19% are other employees of local governments (excluding education and healthcare employees) (84 thousand).

**Graph 93: Number of general government employees (2022), in thousand of employees**

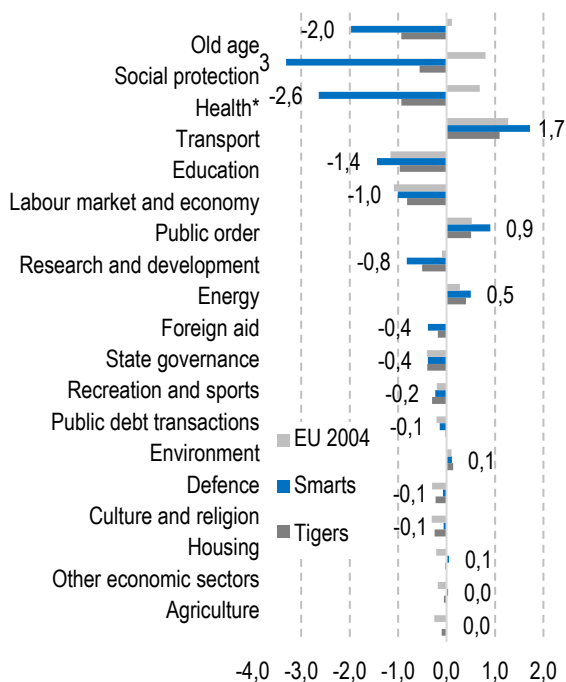


Note: Number of employees in the public service, excluding support staff for the army and cultural workers

Source: BIS; MF SR; processed by VIMU

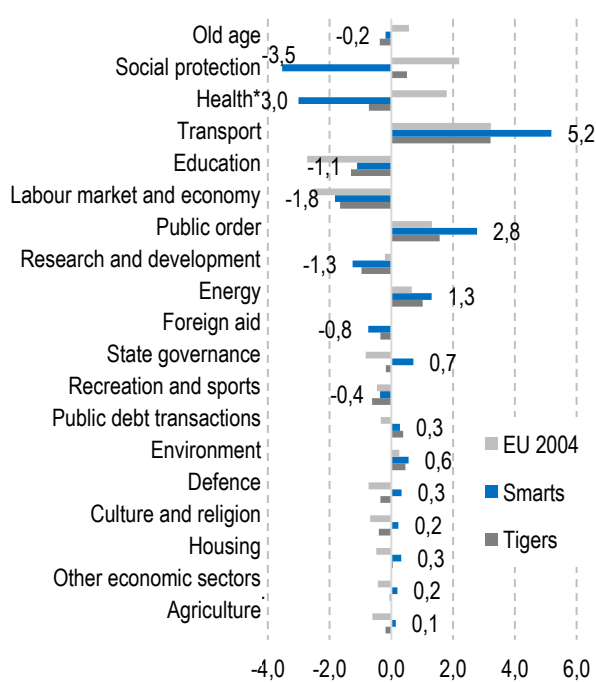
Slovakia spends more than the Smart countries on employee compensations in the public order, transport and state governance areas. At the same time, these three areas are the only ones in which the positive deviation is more significant. On the contrary, lower expenditures on employee compensations are in the healthcare, social security and education areas. For the education area, Slovakia lags behind not only the Smart countries but also the EU 2004 countries.

**Graph 94: Deviations of Slovakia's spending from the reference groups - employee compensations (2011-2020), % of GDP**



\* Adjusted for differences in the age structure of the population.  
 \*\* Basic research and R&D expenditures of each area.

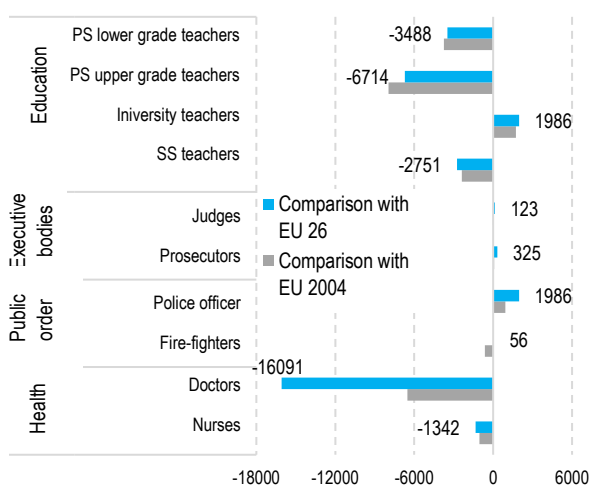
**Graph 95: Deviations of Slovakia's spending from the reference groups - employee compensations (2011-2020), % of wage**



Source: VIMU's elaboration based on Eurostat data

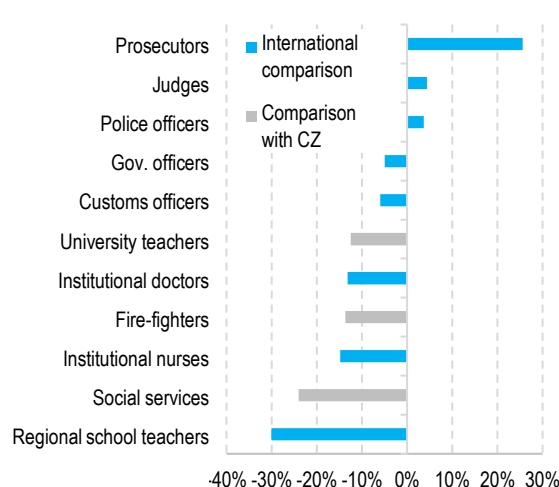
**Compared to the EU average, Slovakia has fewer nurses, primary school teachers and doctors relative to its population. On the contrary, the numbers of university teachers and police officers are higher.** Slovakia also has a slightly higher number of fire-fighters, but the EU countries have more part-time fire-fighters and volunteer fire-fighters, which were not included in the comparison<sup>39</sup>. The comparison does not include social service workers, civil servants and soldiers, who together count approximately 80,000 employees. For social services, there is no reliable international comparison, but the ageing of the population will create pressure towards increased employment in this area.

**Graph 96: Framework comparison of employment by profession with the EU 26 countries and the EU 2004 countries (2019, 2020)**



Source: Eurostat, OECD and CEPEJ

**Graph 97: Indicative international comparison of wages (2014-2016), difference percentages**



Source: Public Wage Bill, 2020

<sup>39</sup> The comparison with other EU countries is indicative as it includes data from different systems and different data sources, but it captures the main trends. The numbers of fire-fighters are taken from [CTIF \(Center for Fire Statistics\) 2022](https://www.ctif.org/).

**The international comparison of average salaries shows that prosecutors earn significantly more<sup>40</sup>, judges and police officers slightly more. Teachers' salaries, in contrast, are lower.** There is also a significant gap in the salaries of social service workers compared to the Czech Republic. Out of the numerous groups of public employees, the comparison does not include soldiers and heterogeneous groups (for example, non-pedagogical employees in the education system or local government employees).

## 2.9 Capital investments: low and targeting mainly transport

**The level of investments in the Slovak economy is generally lower than in the reference countries, which is mainly due to lower corporate investments but also lower investments by the general government. The public sector invests more in transport and public order when compared to other countries. Less investment goes into research and development and education.**

**Slovakia is one of the less efficient countries in translating the amount of capital expenditure into an adequate scope and quality of infrastructure. The economic value of new investment projects also confirms low efficiency, where the average benefit-cost ratio is only 1.5. For example, a ratio greater than 2 is considered the minimum standard in the UK. In addition to increasing investment, it is necessary to enhance the efficiency of investments by implementing well-prepared and highly profitable projects and improving the investment preparation process (long-term planning).**

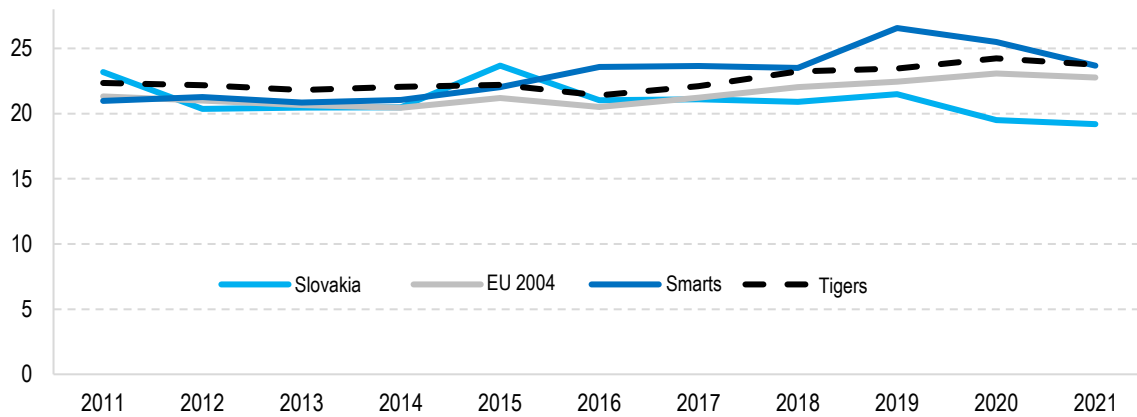
**The level of investment in tangible assets (fixed capital formation) plays an important role in supporting future economic growth by creating the basis for an increase in productivity and production.** Investments (for example, in infrastructure, machinery, etc.) are among the most significant indicators of a country's prospects for medium-term economic growth, considering the degree of development of the country. In the most developed countries, investments in research and development are gaining in importance. Examples of countries' economic development show that the success of modernisation measures and structural transformation of the economy largely depends on the level of investment in fixed capital (Briukhovetska, 2012). Increased investment in physical assets can lead to higher productivity and efficiency, which in turn contribute to the enhancement of the countries' economic standard (increased production of goods, new jobs, development of new sectors in the economy, increased innovation and competition).

**In recent years, total investments in Slovakia (EUR 19 billion in 2021) have made a smaller share of GDP than the average of countries with the highest quality of life (the gap is approximately 4% of GDP, or EUR 3.9 billion).** The differences began to be particularly visible after 2016 when the share of investments began to increase in developed countries, while Slovakia was maintaining a constant level. After 2019, investments in Slovakia even started to decline, which was mainly due to the COVID-19 pandemic. However, despite the pandemic, other countries managed to maintain, or even slightly increase their private investments as a share of GDP. The jump in 2015 was mainly due to the accelerated absorption of the allocations of European funds remaining from the ending programming period.

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<sup>40</sup> In Slovakia, prosecutors' salaries are at par with those of judges, while in the EU countries prosecutors earn on average 20% less.

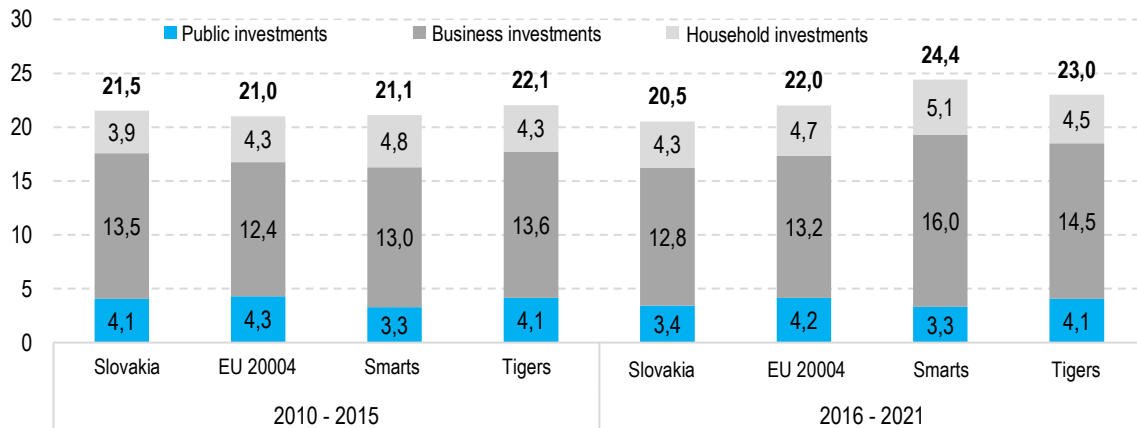
**Graph 98: Total investments in the economy as a share of GDP**



Source: Eurostat

Since 2016, Slovakia has been slightly falling behind, especially as regards the amount of private investments. The Government's and businesses' capital formation can complement each other in supporting long-term economic growth and development. The ratio of private and public investments can vary with the economic cycle; private investments are mostly procyclical in nature. Compared to private investments, public investments are often less sensitive to the economic cycle, or are even used as a counter-cyclical tool to support the economy. However, sometimes their reduction may be the first option when it is necessary to reduce the Government's overall spending.

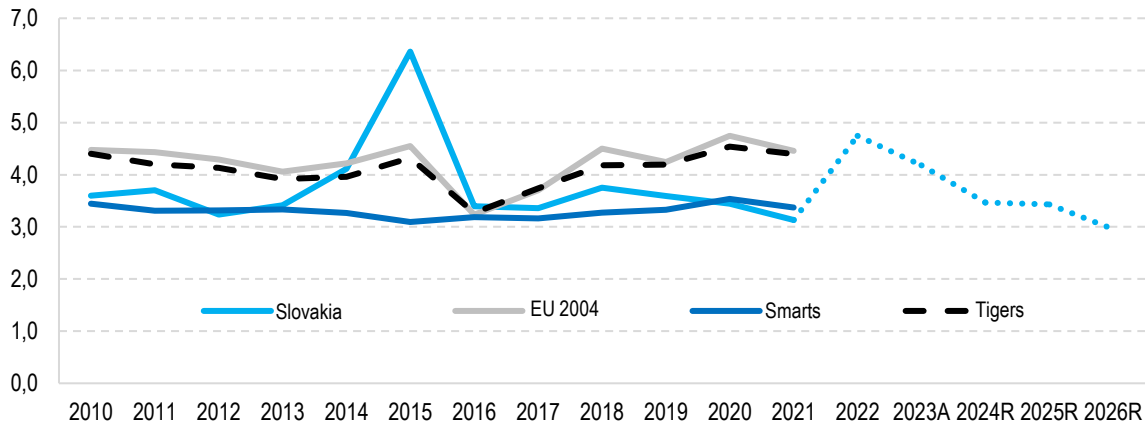
**Graph 99: Average total investments in the economy, % of GDP**



Source: Eurostat

Slovak general government invests 3.8% of GDP annually, which is 0.4% of GDP less than similar countries and the most improving countries. The budget for the years 2023-2025 provides for a substantial increase to EUR 5.8 billion, mainly due to the Recovery and Resilience Plan and EU funds. The biggest gap is that of the developed countries. In recent years, Slovakia's investment amount has increasingly fallen behind the comparable countries and the best improvers. The root cause here may be the general problem with the use of budget allocations seen in recent years.

**Graph 100: General government's gross fixed capital formation (public investments), % of GDP**



Note: Gross fixed capital formation.

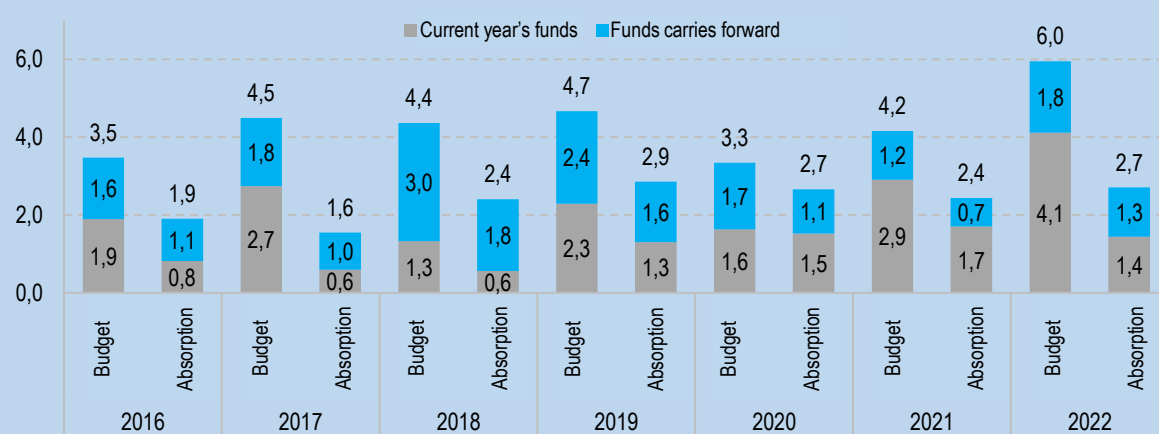
Source: Eurostat, GGB 2023- 2025

**Box 9: Absorption of investment allocations and sources of funding investments**

Between 2018 and 2022, on average, only approximately 56% of the investment allocation budgeted for a year was actually used. In Slovakia, there is a persisting problem with the use of capital expenditure allocations and they are constantly transferred to the subsequent years. Transfers occur especially at the general government level (ministries and central authorities) where nearly EUR 2 billion remain unspent annually<sup>41</sup>.

To improve the absorption, it is necessary to improve both the preparation and the procurement and implementation stages of projects. It must be ensured in the planning and preparation phase that high-quality investment plans are prepared and linked to the budget preparation process and that they include prioritised and profitable projects. Major problems occurring in the procurement and implementation phase include poorly prepared public procurement documentation, or the necessity of changes in the technical design that lead to shifts in deadlines and non-compliance with the work schedule.

**Graph 101: General government's capital expenditure budget and absorption for all sources, EUR billion**



Source: BIS, MF SR (processed by VřIMU)

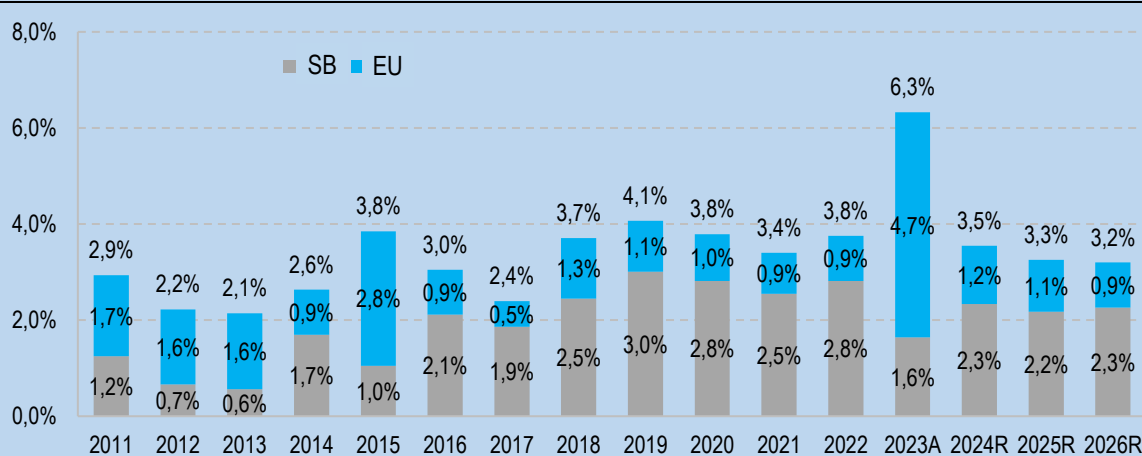
As of 2022, all Ministries with annual investments exceeding EUR 20 million have a published prioritisation methodology, and almost all of them also have an investment plan for at least the next five years. The goal is longer-term planning of future investments to streamline the investment process and improve absorption. Nevertheless, in some cases, investment plans still do not correspond to the actual use of the budget during a year.

<sup>41</sup> The high difference between the budgeted and used allocations in 2022 was specific mainly in that there was a jump in the costs of materials in the market which led to the cancellation or renegotiation of investment project contracts.

In the upcoming years, thanks to the Recovery and Resilience Plan, the Slovak public sector will not face a significant reduction in funds available for investments from the EU sources (both as an absolute amount and as a share of GDP). However, investments will increasingly be redirected to other areas than before, namely from transport (for example, motorway construction) and computerisation to energy, the green economy (decarbonisation), healthcare, etc. Debates are currently underway at the level of the Union about the further setting of the European funds, so it is not yet clear what rules and allocations will apply in the next programming periods (from 2028 on).

However, these funds are not intended to replace public investments from national sources and they should instead enable additional investments aimed at reducing the country's gaps in the most problematic areas. The long-term development in public investments indicates a trend of replacing domestic sources with EU funds, which impairs their contribution to economic convergence ([Labaj, 2023](#)).

**Graph 102: Budget and use of general government investment expenditures by source, % of GDP**



\*SB = state budget; EU = EU funds + co-financing and Recovery and Resilience Plan + VAT

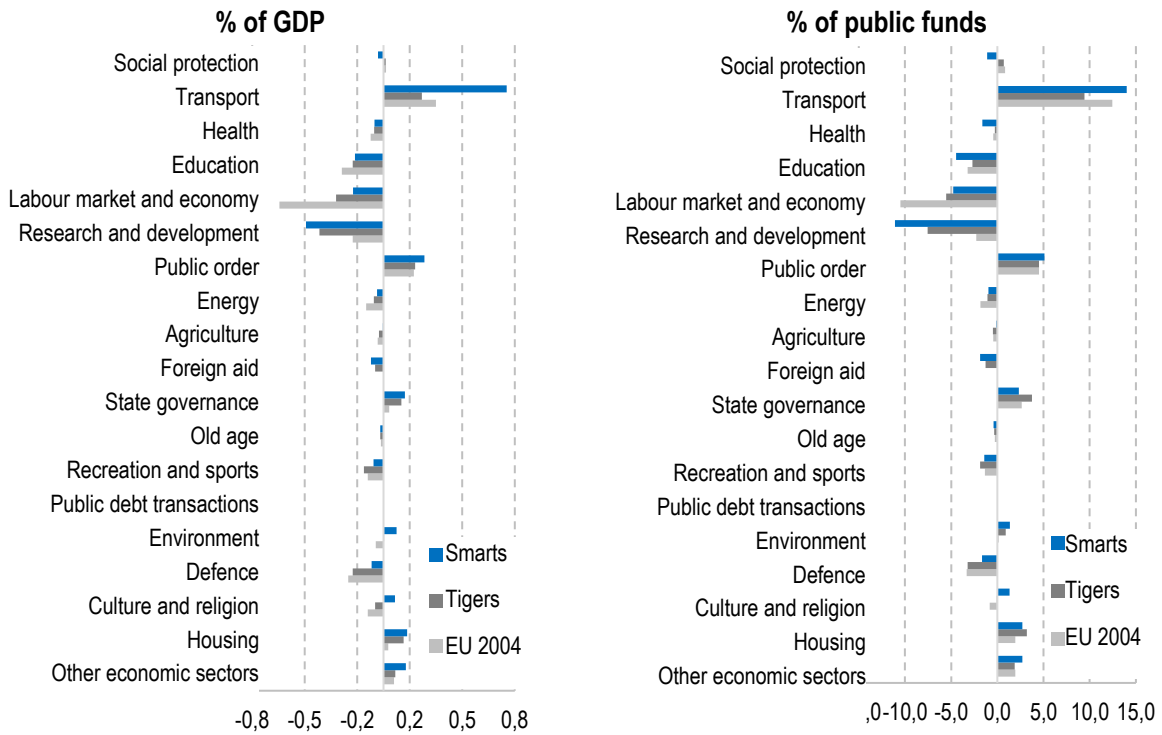
Source: BIS, MF SR (processed by VřIMU)

**Compared to other countries, the Slovak public sector is investing<sup>42</sup>more in transport and public order. Fewer investments are directed to research and development, education and, to some extent, the labour market and the economy. As regards education, underfunding is most marked in the pre-primary, primary and secondary education sub-areas.**

**Capital expenditures on transport go mainly to road transport** (EUR 0.8 billion per year), of which EUR 0.5 billion is invested by NDS (motorways) and EUR 0.1 billion by SSC (roads). Approximately EUR 0.2 billion goes annually to investments in railway transport through ŽSR. Investment expenditures in the public order area mainly consisted of the purchase of government aircraft, information systems, police and fire-fighting vehicles and technology. Investments in the category of executive and legislative institutions mainly include expenditures of the Slovak Ministry of Finance and the Financial Administration of the Slovak Republic (information systems, purchase of technology and renovation of buildings).

<sup>42</sup> Comparisons of expenditures consider not only the direct investment expenditures of general government but also capital transfers. However, their contribution to the deviations is not significant. The main factors are capital transfers in the area of the labour market and the economy, which are low in Slovakia compared to other countries.

**Graph 103: Deviations of Slovakia's capital expenditures (average of 2011–2020)**

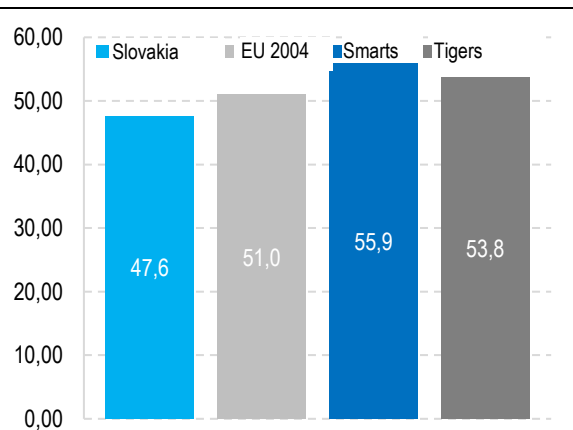


Source: VIMU's elaboration based on Eurostat data

### Public capital

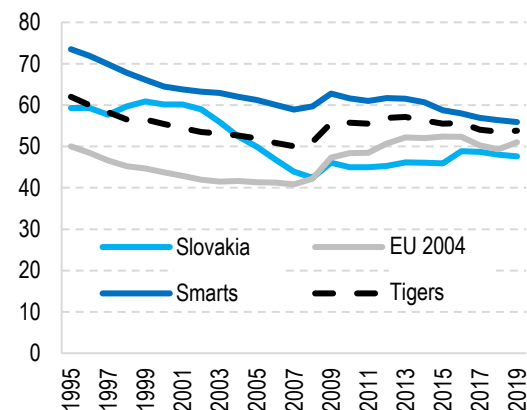
When comparing the countries' investment expenditures, it is necessary to take into account the difference in the condition of infrastructure and public capital<sup>43</sup> in each country. It can be assumed that in contrast to less economically developed countries, the developed ones have already built a sufficient network of such infrastructure and thus do not need to spend so much public funds on it any more. Therefore, when evaluating the amount and distribution of the investment budget, it is also necessary to look at the amount of public capital in the individual countries.

**Graph 104: Public capital value (2019), % of GDP**



Source: IMF, Investment and Capital Stock Dataset

**Graph 105: Development of the public capital value, % of GDP**



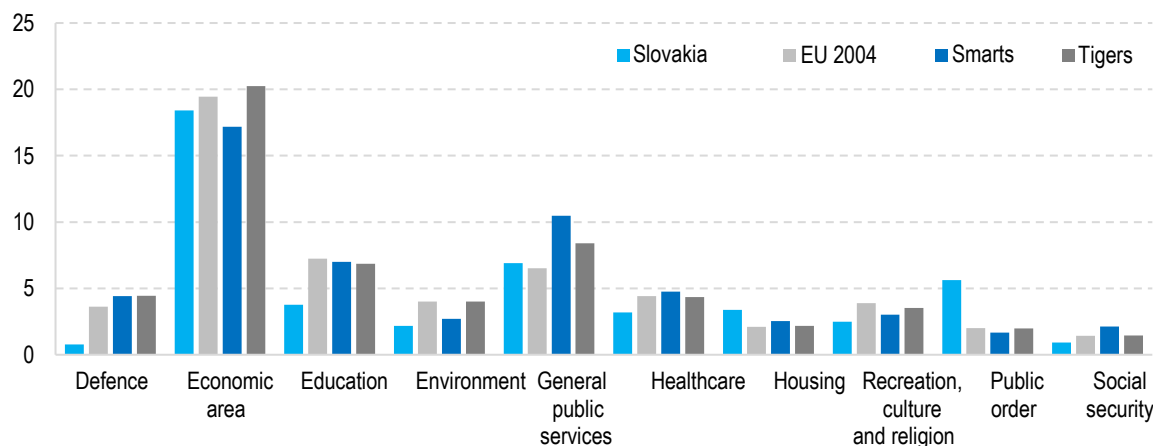
\* Data for SVK are available only from 1995 on.

Source: IMF, Investment and Capital Stock Dataset

<sup>43</sup> Public capital is made up of the value of physical assets, including economic infrastructure (roads, airports, power grids, etc.) and social infrastructure (public schools, hospitals, prisons, etc.).

The value of public capital in Slovakia (47.6% of GDP, approximately EUR 45 billion) is lower than in other countries: the EU 2004 average is 51% of GDP, the average of the Smart countries is 55.9% of GDP. The breakdown by area partly reflects the findings from the comparison of the EU countries' investment expenditures. Slovakia achieves lower-than-average values in education, healthcare, defence, and public services. In contrast, higher values of capital (assets) are in public order. The economic area (consisting mainly of the transport infrastructure) has reached a level comparable to the other countries in recent years. The major factor in this was increased investment spending in 2015.

**Graph 106: Amount of public capital by COFOG area (2019), % of GDP**



\* Breakdown by COFOG areas is not available for Malta, Croatia, Cyprus and Bulgaria. The data for Hungary in "Housing" have negative values and are therefore not used in the given category.

Source: IMF, Investment and Capital Stock Dataset

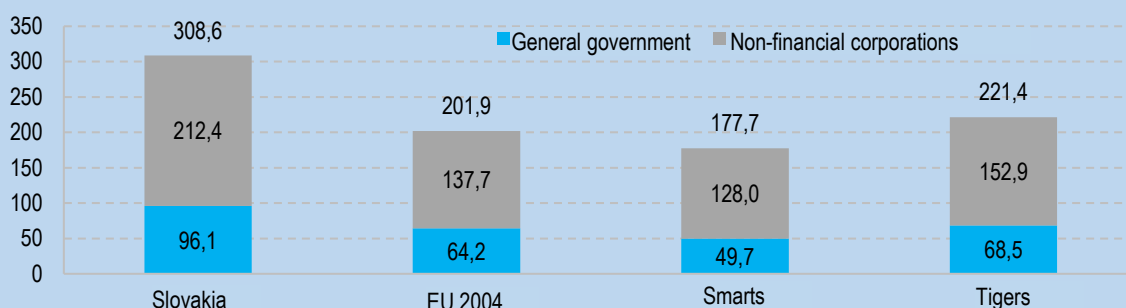
### Box 10: It is not clear how much "property" Slovakia has: varied methodologies, varied results

Data on the value of the state's capital assets vary according to the source or calculation methodology. According to the IMF's methodology, which takes into account only the accumulated discounted expenditures on fixed capital formation, Slovakia has a lower value of public capital compared to the EU average. The countries' Statistical Offices also keep total fixed asset value data. They are derived from fixed capital formation expenditures, similar to the IMF methodology. There are some differences, however, that can be explained by the:

- **Depreciation rate:** the Statistical Office recognises different lifetimes for each category of assets, unlike the IMF whose depreciation rates are differentiated on the basis of a country's level of development.
- **Asset revaluation:** the IMF methodology is based only on aggregated capital expenditures, while the Statistical Office revalues assets in certain cases according to the ESA methodology using restoration costs (costs for building the same capacity at current prices)
- **Asset classification:** in certain cases, the Statistical Office reclassifies assets between the general government and corporations in accordance with the ESA methodology. This concerns mainly companies that are fully or partially owned by the state. The IMF methodology is not able to capture the transition of an entity from one sector to another as such a transaction does not involve any capital expenditure. It is only a reshuffling of the sectoral classification of assets.

Since the calculation of the value of fixed assets is the responsibility of national Statistical Offices, it is not possible to verify the detailed calculation methodologies and their comparability. However, the ESA 2010 methodology and consultations with Eurostat ensure a certain degree of consistency. It is also necessary to take into account differences in the classification of the individual asset items in the general government sector across countries (in Germany, for example, railways and a large part of hospitals are classified outside the general government sector; and there is no motorway company in the general government sector in Austria).

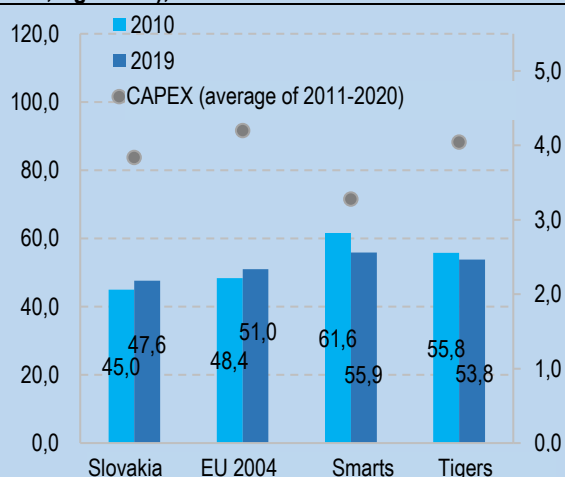
**Graph 107: Value of fixed assets of general government and non-financial corporations (2020), % of GDP**



Source: Eurostat

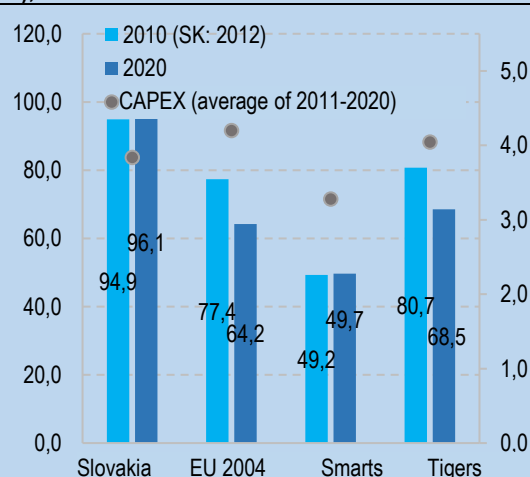
According to Eurostat data, Slovakia has twice as high values of public assets as the Smart countries, while the differences between the other reference groups are only around +15 percentage points. Also, the value of assets of non-financial corporations seems high compared to the other EU countries. It may be more appropriate to use the IMF methodology for an aggregated comparison, to ensure the uniformity of methodologies and the comparability of data.

**Graph 108: Public capital (% of GDP) and investment expenditures of general government (average of 2011-2020, right axis), % of GDP**



Source: IMF, Investment and Capital Stock Dataset

**Graph 109: Fixed assets and investment expenditures of general government (average of 2011 – 2020, right axis), % of GDP**



Source: Eurostat

In this case, however, it is necessary to approach the performance indicators with caution because of several methodological limitations, as mentioned above; examples may include different approaches to measuring the total amount of capital, differences in the classification of the general government sector in Slovakia and the other countries (state transport companies, medical facilities, etc.) and, also, the choice of indicators. The indicators were chosen to cover a relatively wide range of services provided by the state to citizens. At the same time, their scope or quality largely depends on the built infrastructure or investments. Similar indicators are also used by the International Monetary Fund (IMF) (for example, net electricity generation) when analysing the efficiency of public investments.

### Efficiency of public capital

The amount of public capital is supposed to have direct effect on the scope and quality of the provided infrastructure or services for citizens. Public capital is expected to increase welfare and long-term growth prospects. Efficiency of public investments (public capital) means the ability to improve the volume and quality of infrastructure (performance indicators) with a given level of expenditure. For example, if two otherwise similar countries spend the same on roads, the country with more kilometres of paved roads is more efficient. However, such approach

does not measure the infrastructure use efficiency (for example, how many cars drive on a given road), which is the essential factor in evaluating the efficiency of infrastructure investments. The overall efficiency assessment of investments is made at the project proposal stage.

**Table 17: Comparison of indicators between the groups of selected countries (2020)**

Area	Indicator	Slovakia	Tigers	Smarts	EU 2004
Energy sector	Net electricity production per 1,000 of population (GWh/1,000 of population)	4.8	6.5	8.3	4.4
Healthcare	Number of hospital beds per 1,000 of population	5.7	5.4	4.4	5.2
Public services	Proportion of population connected to municipal and other waste water treatment plants (%)	69.3	80.6	89.7	80.7
Transport	Length of motorways in proportion to the country's area	16.7	16.9	24.6	13.7

Source: Eurostat, OECD

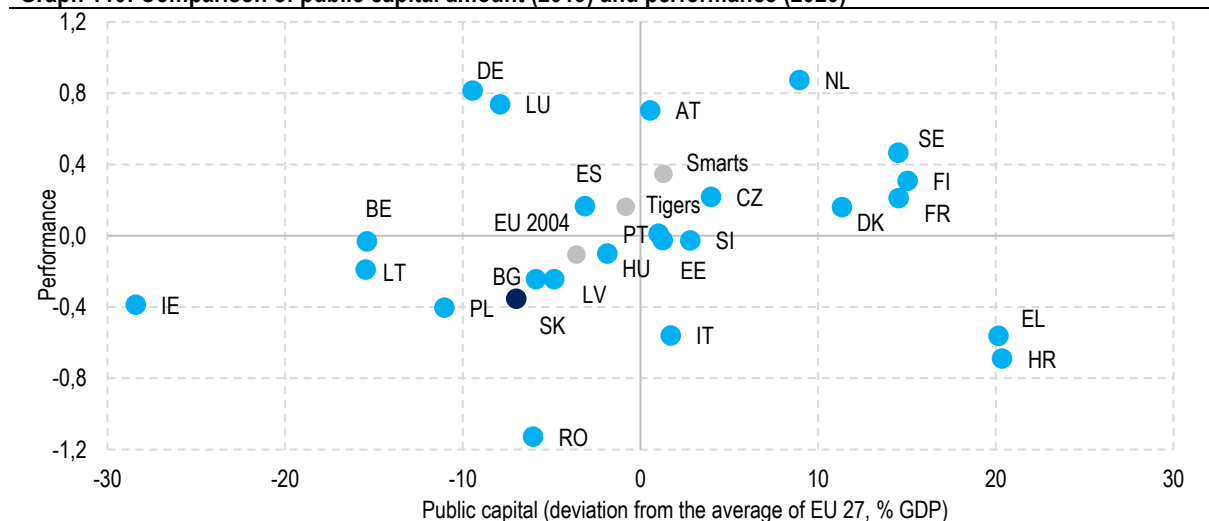
**Table 18: Composite indicators for the public investment area: normalised deviations from the EU average**

Indicator	Slovakia	Tigers	Smarts	EU 2004
Net electricity production per 1,000 of population (GWh/1000 of population)	-0.30	0.29	0.92	-0.44
Number of hospital beds per 1000 of population	0.49	0.24	-0.27	0.23
Proportion of population connected to municipal and other waste water treatment plants (%)	-0.94	0.30	0.48	-0.03
Motorway density (km per thousand of km <sup>2</sup> )	-0.21	-0.20	0.09	-0.47
<b>Public investments</b>	<b>-0.24</b>	<b>0.16</b>	<b>0.30</b>	<b>-0.18</b>

Source: Eurostat, OECD, processed by VIMU

**Slovakia is among the worst-performing countries in the EU with regard to the monitored indicators (Graph 110).** The countries of the former Eastern bloc, except for the Czech Republic, show below-average performance, but so do also some developed countries. Slovakia's position is worsened mainly by low access to wastewater treatment plants but also a low length of motorways. Greece (EL) is a bad model which despite high values of public capital, achieves below-average results in the monitored indicators of the level of public infrastructure.

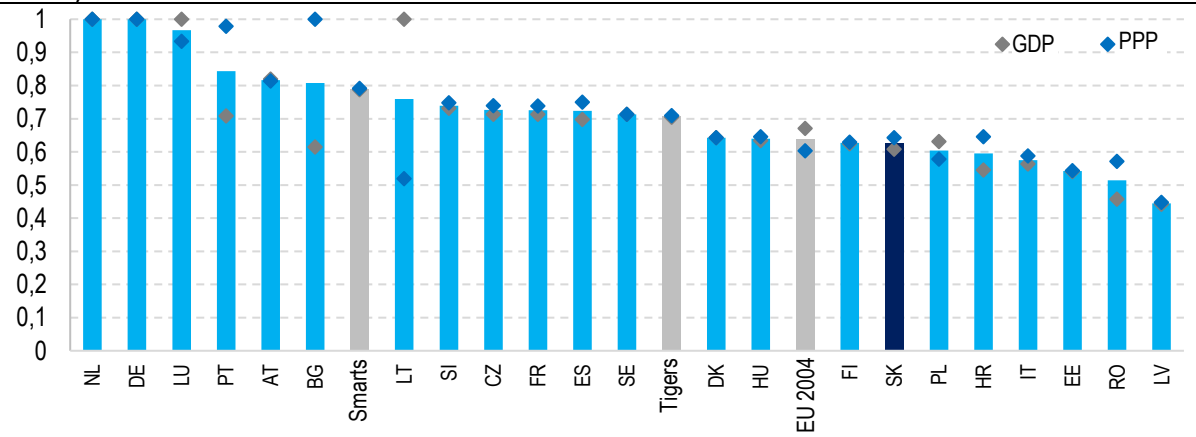
**Graph 110: Comparison of public capital amount (2019) and performance (2020)**



Source: IMF, Investment and Capital Stock Dataset, Eurostat

**Slovakia is one of the less efficient countries in translating the amount of expenditure into an adequate scope and quality of infrastructure.** The effectiveness of public investments or the level of public capital of a country measures the infrastructure quality ratio (output) for any given level of cumulative expenditure or capital (inputs). The amount of public capital per inhabitant or GDP (according to the IMF) is the input and the output is a composite indicator made up of the individual indicators measuring the state of infrastructure mentioned above.

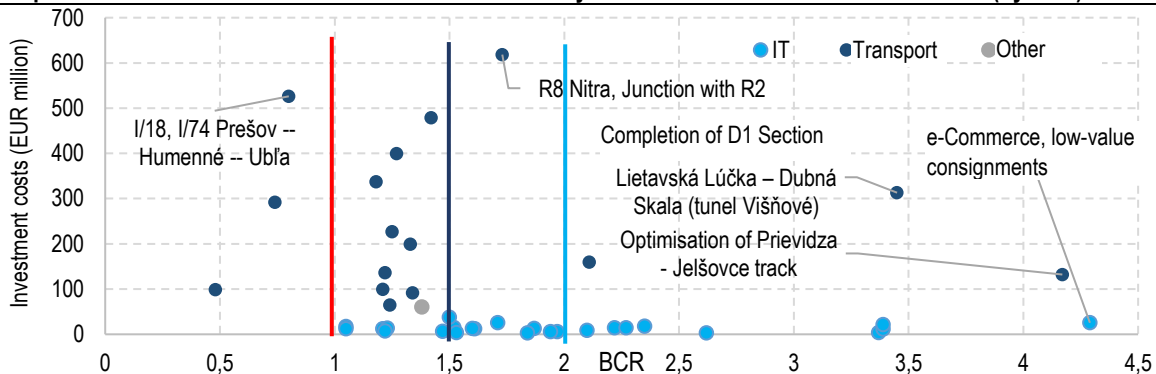
**Graph 111: Public capital efficiency, DEA (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, IMF, processed by VfMU

**The low economic returns on investment projects also confirm the insufficient efficiency of Slovak public capital.** The economic value of most investment projects reviewed by the MF SR only closely exceeded their costs. This is expressed by a project's benefit-cost ratio (BCR), which averages 1.5 in Slovakia (1.38 for transport projects, 2.6 for IT and only 1.1 for other projects). In the UK, a ratio greater than 2 is considered the minimum standard, depending on the type of project. In Slovakia, only about 30% of the investment projects reviewed by the MF SR reached this level.

**Graph 112: Return on the assessed investments for the years 2017-2021 with verifiable benefits (by area)**



\*Projects with verifiable benefits according to the MF SR's assessment.

Source: VfMU based on the assessed feasibility studies

**The long-term underfunding of some areas, combined with inappropriate prioritisation, has led to the accumulation of an investment gap<sup>44</sup> estimated at more than EUR 46 billion.** Slovakia has the highest investment gap in the revitalisation of railway lines (EUR 12.1 billion), completion of motorways with an international commitment that connects to international corridors (EUR 8.1 billion) and renovation of state buildings (EUR 6.8 billion). However, the long-term underfunding of the maintenance of class I roads and bridges can have more acute consequences on the quality of services for citizens. Thirteen areas were selected on the basis of available supporting documents and the expert estimate of the Investment Authority (VfMU) for which a high investment gap is estimated. There are assumably more areas in which an investment gap has accumulated and the estimate of EUR 46 billion may not represent Slovakia's total investment gap. The investment gap estimates are based on preliminary calculations, primarily using unit costs (Annex 12).

<sup>44</sup> There is no exact definition of investment gap and a variety of methodologies exist to determine its amount. The figure simply represents the difference between investment needs and the current state. To quantify the investment gap "from the bottom up", the specific targets and the funding needed to meet them were set; for railways, for example, this includes the costs of the renovation of the busiest track sections and TEN-T core network projects to be implemented within the framework of international commitments until 2030.

**Table 19: Investment gap estimate summary**

<b>Area</b>	<b>Target</b>	<b>Gap estimate in EUR million</b>
<b>Total investment gap</b>		<b>46,326</b>
Transport	Revitalisation of tracks with a service life of up to 10 years and modernisation of TENT-T corridors	12,094
	Completion of motorways with an international commitment	8,063
	Reinstatement of class I roads to a condition meeting the basic traffic standard	3,175
Renovation of state buildings	Renovation of all state buildings in an unsatisfactory condition	6,775
Comprehensive renovation of state hospitals	Comprehensive modernisation of the institutional healthcare network	4,661
Sewer and water supply systems	Completion of the construction of sewers and water supply lines	3,063
Defence	Achieve the annual defence commitment of 2% The amount of EUR 3.2 billion represents only investments.	3,208
Environmental burdens	Remediation of all confirmed environmental burdens	2,186
National cultural monuments	Renovation of all NCMs owned by the state or municipalities whose condition so requires	2,583
Schools and kindergartens	Provision of additional kindergarten and primary school capacities to eliminate the two-shift operation of primary schools and debarrierisation of secondary schools	398
Replacement of vehicle fleets	Replacement of general government vehicles with expired service life	120

*Source: MD SR; calculations made by VfiMD*

### 3 What should be the priorities?

**Based on the findings, this review identifies priority areas for public spending.** These are the sectors with the most lagging performance and expenditures, in which a gradual increase in expenditures can lead to an improvement in the population's quality of life.

**The prioritisation of areas should lead to a change in the structure of expenditures.** When deciding on the allocation of resources, the priority areas should be given precedence, regardless of whether the total public spending is to increase, decrease, or remain the same. If the total envelope were to increase, the spending on the priorities would grow faster. During consolidation, on the contrary, it should be reduced as little as possible. When the level of total expenditures is to remain unchanged, it would be appropriate to look for additional sources in lower-priority areas to fund the high-priority ones. In all three cases, the structure of expenditures would change.

**Even for the high-priority areas, it is not enough to merely increase expenditures. It is necessary to improve efficiency significantly.** Compared to the reference groups of countries, Slovakia is falling behind in the ability to convert public funds into results. Therefore, any increase in spending must be conditional on efficiency improvements. It needs to be achieved particularly by adopting reforms to ensure that the money spent brings better results. It is necessary to increase efficiency, not only in the priority sectors but in all sectors.

**Table 20: Evaluation of the areas in comparison with the reference countries\***

Area	Expenditures	Performance	Value for money	Spending priority
Education	Lower	Poor	Medium	Yes
Research and Development	Lower	Poor	Low	Yes
Healthcare	Comparable	Poor	Very low	Yes
Old age	Higher	Comparable	Medium	No
Social protection	Comparable	Good	Medium	No
Transport	Higher	Comparable	Low	No
Public order	Higher	Poor	NA	No

\*The evaluation of expenditures and performance is based on a comparison with the reference countries. Lower/higher spending or poor/good performance indicate a state against all three groups. Value for money is determined using DEA results.

**Spending priorities should include education and research and development.** Slovak spending on education and research and development has been low for a long time, and performance is among the worst of the compared countries, while both areas are crucial for future economic growth.

- **The spending on education has been low for a long time and the performance corresponds to this. An increase to the level of the Tigers would mean an additional 1% of GDP (EUR 1.2 billion in 2023 prices).** Slovakia has underfunded all three sub-areas of education, except the secondary education, where it has got closer to the Tigers in recent years. An educated population is important not only for economic growth: educated people have higher labour productivity, receive higher salaries, pay higher taxes, need fewer social benefits, and consume less healthcare. Therefore, they save the state's resources. Slovakia is among the less efficient countries, but the lag is lower than in the other areas.
- **Along with increasing the research and development expenditures, the efficiency of their use must improve, too. The review proposes increasing the public spending on research and development from 0.55% to 1% of GDP.** It should help to attract private resources, which are currently scarce. Good research and development performance increases productivity and thus contributes not only to the economic growth but also to the population's well-being. Higher funding efficiency can be achieved, for example, by increasing the share of competitive funding, reducing the administrative burden, rationalising the activities of research organisations or joining specialised scientific research centres such as [CEITEC](#)

or [BIOCEV](#) in the Czech Republic. More specific proposals can be found in the research, development and innovation review ([VfMU and VAIA, 2023](#)).

**Like in other countries, healthcare spending grows faster than the economy, but it is necessary to improve the efficiency of its use significantly.** Slovakia's healthcare expenditures correspond to the wealth of the country. Wealthier countries usually spend more on healthcare not only in absolute figures but also as a share of GDP. When adjusted for demographics, Slovakia's expenditures are higher than those of other similarly rich countries. However, the performance does not correspond to the amounts spent. Countries with similar levels of spending are able to use resources much more effectively. A significant part of the substantive proposals for improvement is included in the healthcare spending review ([VfM Unit, 2022](#)).

**The expenditures related to old age, social protection, transport and public order seem to be sufficient.** Slovakia's expenditures in those areas are relatively high or comparable to the developed countries' spending. The challenge is thus the efficiency and structure of expenditures rather than underfunding.

- **On average, the pension system in its current set-up replaces people's previous income relatively well.** The expected ageing of the population poses a risk to public finances, however, some measures have been taken to improve its sustainability in the long run. Relinking the retirement age to the increase in life expectancy is the factor with the highest impact. It is necessary to re-consider the non-systemic elements of pensions that have undermined the basic concept of sustainability of the pension system based on indexation, which preserves the purchasing power of pensioners. Although there are still pensioners with a very low pension or in difficult life situations, they should be caught by a well-functioning social net. In the future, the old-age social policy should focus more on the offer of services.
- **The structure of expenditures in social protection needs a change.** For a long time, sickness and disability have been funded higher than in the reference groups of countries. As regards family support, with the Family Package Slovakia has leapfrogged to catch up even with the Smart countries. However, in contrast to them, the Family Package has further reinforced direct financial instruments at the expense of services such as nurseries and children's groups that could be more beneficial to families with small children. A higher rate of use of social benefits is visible across all sub-areas of social protection. Therefore, the study recommends considering a change in the structure of expenditures following the model of Smart countries: fewer across-the-board transfers, higher targeting of benefits and more services provided or financed by the state.
- **Due to the need to complete the infrastructure, transport expenditures should not decrease in the upcoming years.** A reduction in Slovakia's otherwise internationally above-standard transport expenditures will only be possible after the completion of the major infrastructure projects and the implementation of productive investments that will reduce operating costs, such as railway automation. However, once we complete the large transport projects, we should redirect investments to other areas.
- **For the public order area, expenditures tend to decrease with the growth of the country's wealth as it usually correlates with a reduction in criminality.** Slovakia has long been spending on public order comparably to the neighbouring countries but more than all reference groups. As wealth grows, public order spending as a share of GDP is supposed to decline in the long run, as it does in developed countries. The performance in this area is among the worst in the EU. Some of the indicators, such as trust in the police or the judiciary, are interlinked with the overall climate in the society, such as the trust in institutions in general. It needs to be built and fostered not only by the sector itself but also by the education system and politicians.

## Annexes

### Annex 1 Structure of public expenditures

**Table 21: Structure of public expenditure in Slovakia (average of 2011-2020 )**

COFOG	% of GDP		% of public expenditures		EUR billion	
	Average	Difference	Average	Difference	Average	Difference
Old age	7.69	0.93	18.40	0.27	6.31	2.37
Social protection	7.11	0.46	17.00	-0.74	5.83	1.92
Health	5.49	0.39	13.14	-0.45	4.50	1.53
Education	4.06	0.19	9.70	-0.61	3.33	1.09
Transport	3.96	0.57	9.48	0.46	3.25	1.24
State governance	3.02	1.08	7.22	1.72	2.47	1.59
Public order	2.34	0.11	5.60	-0.31	1.92	0.60
Public debt transactions	1.67	-0.36	3.99	-1.19	1.37	0.02
Defence	1.03	-0.23	2.47	-0.80	0.85	0.04
Environment	0.97	0.41	2.33	0.69	0.80	0.58
Culture and religion	0.81	0.14	1.93	0.12	0.66	0.30
Energy sector	0.79	0.01	1.90	-0.18	0.65	0.18
Research and development	0.71	-0.13	1.70	-0.47	0.58	0.03
Housing	0.71	0.18	1.69	0.25	0.58	0.30
Labour market and economic affairs	0.55	-0.27	1.32	-0.78	0.45	-0.09
Other economic sectors	0.35	1.19	0.83	2.56	0.29	1.16
Agriculture	0.33	-0.20	0.80	-0.55	0.27	-0.08
Recreation and sports	0.17	0.02	0.40	0.01	0.14	0.06
Foreign aid	0.04	0.00	0.10	0.00	0.03	0.01
<b>ESA 2010</b>						
Social benefits	17.06	0.76	40.80	-2.74	13.99	4.36
Compensation of employees	9.28	2.98	22.19	4.50	7.61	4.59
Intermediate consumption	5.82	-0.29	13.93	-2.24	4.78	1.02
Capex	4.44	-0.17	10.62	-1.57	3.64	0.82
Other current transfers	1.71	1.64	4.10	3.34	1.40	1.82
Property income*	1.58	-0.36	3.78	-1.21	1.30	0.00
Subsidies	1.91	-0.06	4.58	-0.09	1.57	0.33
<b>Total expenditures</b>	<b>41.81</b>	<b>4.50</b>	<b>100</b>	<b>0</b>	<b>34.28</b>	<b>13.01</b>

\* Mainly the interest paid on the debt.

Source: VfMU's elaboration based on Eurostat data

## Annex 2 Description of methodology

### Sampling

**Benchmarking is the main method of the review.** Slovakia has been a member of the EU since 2004 and it is thus benchmarked against the other EU countries. Comparisons with a relatively small group of countries would not be appropriate. With a small sample of countries, the occurrence of an outlier or possible differences in the reporting of some partial data would affect the results more easily (for example, Hungary's spending on sports, culture or religion distorts the V4 averages). With larger groups, such problems are avoided.

**The main benchmark group that defines Slovakia's targets is the Smart countries.** These are the nine highest-ranked EU countries in the [Better Life Index](#), i.e. Belgium, Denmark, Finland, France, the Netherlands, Ireland, Germany, Austria and Sweden. Luxembourg was not included in the sample, as it differs significantly from the rest of the countries in socioeconomic indicators. **Further, the review works with two control groups: the most improving countries in the Better Life Index ranking (Tigers) and the countries that joined the EU together with Slovakia (EU 2004).** The Tigers include the Czech Republic, Estonia, Hungary, Germany, Poland, Spain and Sweden. The EU 2004 consists of Cyprus, Czech Republic, Estonia, Lithuania, Latvia, Hungary, Malta, Poland and Slovenia. The Tigers are the countries considered to have made changes during the observed period that allowed them to improve. In not all areas is it most appropriate to benchmark Slovakia against the countries that had a different starting position than Slovakia at the beginning of the period; one example is investments (it is assumed, for example, that the Smart countries already have a largely developed infrastructure, while Slovakia, in contrast, is still building it). The EU 2004 countries are thus considered to have approximately the same footing as Slovakia in terms of the starting position and the possibilities for benefiting from the integration.

**Neither the Smarts nor the Tigers may be an optimal benchmark for determining the targets in the individual areas.** For example, even the Smart countries are not among the world's leaders in research and development expenditures and performance; and more suitable benchmarks could be found in other areas, too. The choice of the reference groups represents a compromise between a consistent approach across the review and analytical precision. At the same time, too small samples such as V3 (Czech Republic, Hungary, Poland) are not suitable. The sensitivity analysis of the Smarts and the Tigers can be found in Annex 4.

**The examined period is the years 2011 to 2020, i.e. the last ten years for which data are available.** The period should be determined using the same rule as applies to the selection of countries: the smaller the range, the greater the impact of outliers on the average. Five-year averages were initially considered. The sensitivity analysis is presented in Annex 4 Sensitivity of the choice of reference groups. As it turned out, for example, for transport, even a 5-year average may not be sufficient to address outliers. In 2014 and 2016, the share of transport expenditures was higher than in the other years and 2015 can be considered an outlier. The consequence of this is that the first and last averages have the lowest values and they are very close to the average over the whole 10-year period. Therefore, 10-year averages were chosen to obtain a consistent picture of the funding of the specific areas.

### Breakdown of expenditures by spending area

**The source of the expenditure data for the review is Eurostat. This is supposed to guarantee a certain degree of consistency across countries. Nevertheless, the international comparison of expenditures may be complicated by differences in the national approaches.** Despite Eurostat's efforts towards the greatest possible uniformity, not all countries approach the classification of entities into the public sector in the same way. In Austria, for example, the motorway company is not included in the public sector and there may also be differences with regard to hospitals. Countries also differ in how they approach partnerships with the private sector (PPP projects) and this influences the ratio between their own investments and the purchase of goods and services. The public expenditures do not include funds from the European budget that are not channelled to the general government sector and a large portion of this is support for farmers, which is included in expenditures (see below).

The expenditures are divided into groups according to the ESA 2010 classification and into areas according to the COFOG functional classification. Consolidated expenditures of the general government sector are considered public expenditures (S.13). [ESA 2010](#) allows breaking down expenditures into gross capital formation (P.5), capital transfers (D.9), intermediate consumption (P.2), employee compensations (D.1), other current transfers (D.7), property income (D. 4), social benefits (D.6) and acquisitions less disposals of non-produced assets (NP). The breakdown of expenditures into areas according to COFOG is more relevant to the objective of this review.

The COFOG structure includes 10 basic areas/divisions and 69 sub-areas/groups. Eighteen of them are examined in the review. Some expenditures can have a more specific purpose. It is then up to the national authority to determine the classification of such expenditures. Some countries break multi-purpose expenditures into relevant divisions or groups, while others assign a multi-purpose expenditure to the area accounting for the largest proportion of the spending. For details see the [Manual on sources and methods for the compilation of COFOG statistics](#). Assumably, the higher the degree of aggregation of the areas, the smaller the inconsistencies resulting from the slight differences in the national approaches to reporting expenditures. Nevertheless, some divisions that integrate different areas need a further breakdown. The Table below captures the final breakdown of COFOG used in the study.

**Table 22: Description of the COFOG categories used**

Name of the authority		COFOG code	Description
General public services		GF01	This category is further broken down in the study into state governance, debt transactions and foreign aid.
Of which:	State governance	GF0101, GF0103, GF0106 and GF0108	Expenditures on the administration, operation or support of legislative, executive, law-making bodies; administration of financial and budgetary affairs; administration of foreign affairs and services, administration of tasks related to the development of international relations and cooperation; general public services (for example, compilation of statistics, general personnel services other than specific functions); general public services not elsewhere classified ( <i>residual</i> ); transfers of a general nature between different government levels ( <i>nearly zero values</i> ).
	Public debt transactions	GF0107	Interest payments and expenditures associated with receiving and providing loans, excluding administrative expenditures on debt management.
	Foreign aid	GF0102	Expenditures on foreign economic aid; administration of economic cooperation with developing countries; administration of aid through international organisations; contributions in cash or in kind
Defence		GF02	Expenditures on military defence, civil protection and foreign military aid.
Public order		GF03	Expenditures related to the provision of police services, fire protection, courts and prisons.
Economic affairs		GF04	Broken down in the review into the labour market and economic affairs, agriculture, energy, transport and other economic sectors
Of which:	Labour market and economy	GF0401	Expenditures on the administration of general economic and commercial affairs and services such as exports and imports as a whole, commodity and stock markets, patent institutions and copyrights, registration institutions, etc.; expenditures on the administration of general labour matters and services, including the support of programmes (projects) to facilitate labour mobility and reduce discrimination and unemployment in the least developed districts (LDDs), employment support, etc.
	Agriculture	GF0402	Expenditures related to the management of agricultural affairs and services (agriculture, forestry, fishing and hunting); construction and operation of flood protection systems; irrigation and drainage systems; support for agricultural activities.
	Energy	GF0403	Expenditures related to coal and other mineral energy resources, oil and natural gas, nuclear fuel, other fuels, electricity and energy other than electricity. For subsidies, those supporting the energy generation, distribution and use and the like.
	Transport	GF0405	Expenditures related to the provision of road, waterway, rail, air, pipeline and other transport.
	Other economic sectors	GF0404, GF0406, GF0407 and GF0409	This summary group includes expenditures on mining, production and construction, communication, distribution networks and storage, accommodation and food, tourism, multi-purpose development projects.
Environment		GF05	Expenditures related to the administration and provision of waste and waste water treatment services, pollution reduction, nature and landscape protection.

Name of the authority		COFOG code	Description
Housing		GF06	Expenditures on the administration and provision of services in the area of housing development, community development, water supply, public lighting.
Health		GF07	Expenditures on healthcare provided to individuals (patients) and expenditures on healthcare provided on a collective basis. Instead of the COFOG health expenditure structure, the study uses the SHA structure. The justification is given below. This approach also addresses problems with classification differences.
Recreation, culture and religion		GF08	Broken down in the review into the recreation and sports area and the culture and religion area
Of which:	Recreation and sports	GF0801	Expenditures on the administration, control, operation or support of facilities for active sporting or sports events, facilities for recreational and sports activities, support for sports teams or individuals.
	Culture and religion	GF0802- GF0804 and GF0806	Expenditures on the administration or support of cultural services, broadcasting and publishing services, religious and other social services. <a href="#">The Culture Spending Review uses a similar approach.</a>
Education		GF09	Expenditures on the provision of services to individual pupils and students, provision of services on a collective basis, including all types of schools and school facilities (state, municipal, church, private). Broken down into pre-primary and primary, secondary, post-secondary non-tertiary and tertiary education, education not defined by level, subsidiary services to education.
Social protection		GF10	Broken down in the review into old age and social protection
Of which:	Old age	GF1002	Expenditures on services and transfers provided to individuals and households and on old age related services.
	Social protection	GF10 without GF1002 a GF1008	Expenditures on services and transfers provided to individuals and households and on services provided on a collective basis. The expenditures are broken down by purpose into sickness, disability and severe disability, survivors, family and children, unemployment, housing, social assistance in material and social need.
Special category	Research and development	GF0104, GF0105, GF0204, GF0305, GF0408, GF0505, GF0605, GF0705, GF0805, GF0907, GF1008	A category formed to cover the basic research expenditures and R&D expenditures of all areas.

### The expenditures are adjusted to be as comparable as possible

**For some areas, the expenditures are adjusted by factors that fundamentally influence their amount and can be reflected relatively easily.** Expenditures not only depend on political decisions but are often influenced by immutable factors as well. One example is the share of the population at retirement age and its impact on the amount of old-age pensions. Some areas do not include relevant resources for the reason that Eurostat does not treat them as direct public expenditures; examples are tax expenditures or European funds disbursed outside the general government sector. Therefore, the expenditures of some areas are adjusted accordingly (Table 23).

**Table 23: Expenditure adjustments**

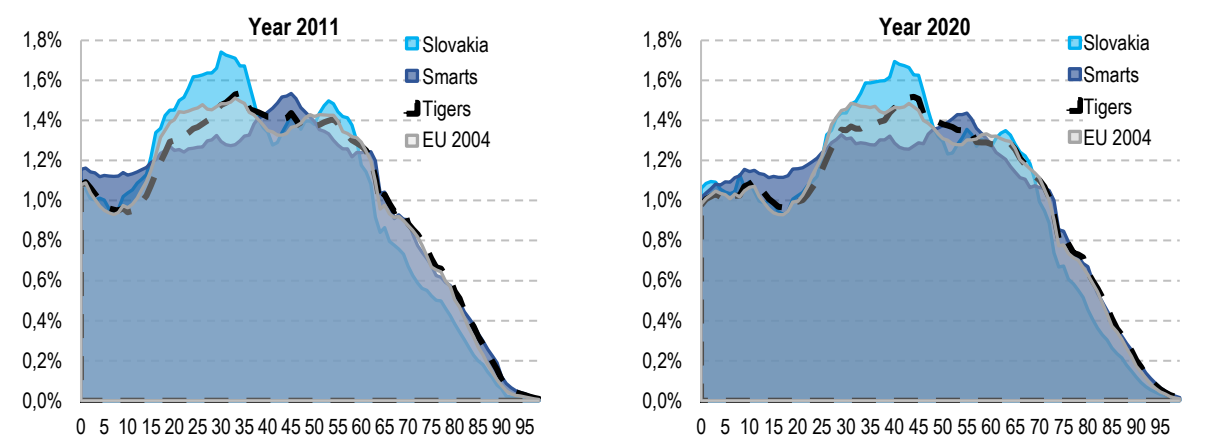
Area	Adjustment	Area of adjustment
Research and development	Inclusion of tax expenditures supporting science and research	All sub-areas of applied research and basic research (GF0104)
Agriculture	Inclusion of European funds from agricultural support mechanisms	Agriculture (GF0402)
Health	Replacement of COFOG data with SHA data	All Health (GF07).
	Adjustment for the share of the population aged 65+	All Health under SHA

Area	Adjustment	Area of adjustment
Education	Adjustment For the share of the population aged 3-25.	All Education (GF09)
Social protection	Adjustment for the share of the population aged 65+ and 0-17	Sickness and disability (GF1001) and family and children (GF1004).
Old age	Adjustment For the share of the population aged 65+	Old age (GF1002)

## Demographics have the most fundamental impact on spending

**Slovakia has a different demographic structure than the countries in the compared groups, which affects the amount of expenditure in some areas.** Compared to the Smart countries, the proportions of the youngest and oldest age groups in the total population are lower, while the proportion of the working-age population is relatively higher. Due to the different demographics, it is necessary to adjust the expenditures on education or family and children to reflect the size of the group of young people and the expenditures on old age, sickness and disability or healthcare for the share of older age categories. The expenditures of other countries are recalculated as if they had the same age structure as Slovakia.

**Graph 113: Proportions of the individual age groups in the total population**



Source: Eurostat

## Expenditures can also be adjusted by other factors

**Expenditures were also controlled for other factors in addition to demographics using a simple regression model.** Demographics may not be the only important factor determining the amount of spending. For example, the health sector will also be influenced by the wealth of the country and the health status or the lifestyle of the population. The regression analysis provides an estimate of Slovakia's expected spending in the areas after considering the most important factors. Estimates are then compared with the actual expenditures (Filko, Mach and Zajíček, 2012).

The outcome of this exercise is that, for example, while we spend less on the social sector than the EU, when demographics are taken into account, the spending is about the same, and if differences in wealth, different types of unemployment and economic activity are also included, our spending is even a little higher. The results suggest that adjusting expenditures makes sense and that a look at unadjusted expenditures can be misleading. At the same time, it turns out that, especially where a significant influence of demographics is expected, a simple adjustment is relatively sufficient and, accordingly, the review further works with expenditures adjusted using the simple approach.

**Table 24: Differences in expenditures between Slovakia and the EU 27 with the application of the different adjustment approaches**

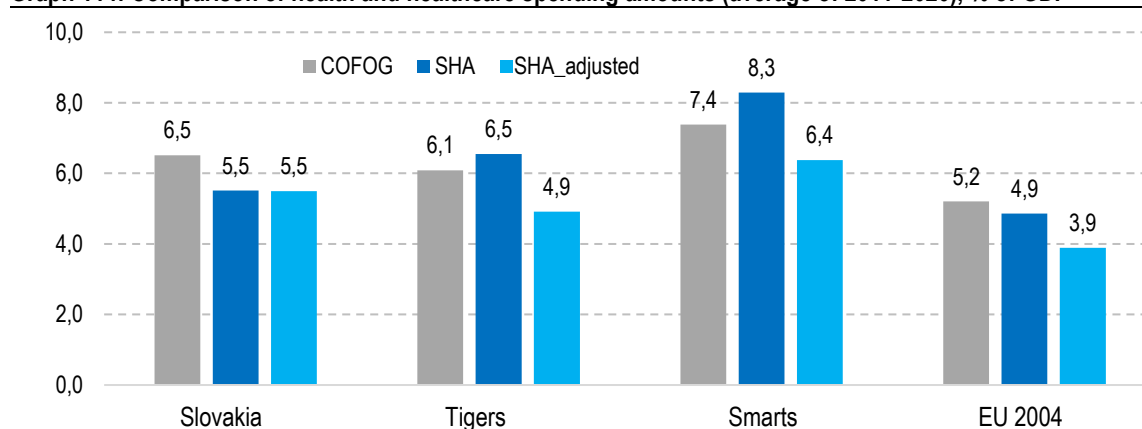
Area	Non-adjusted expenditures	Simple adjustment	Regression adjustment
Old age	-1.54	0.46	1.90
Social protection	-0.52	-0.02	0.25
Transport	1.38	1.38	NA
Healthcare	-0.59	0.36	0.84
Education	-0.90	-0.99	-1.07
Public order	0.59	0.59	0.30
Research and development	-0.35	-0.39	NA

### Expenditures on health and healthcare, COFOG versus SHA

**Health expenditures are replaced by expenditures according to the OECD System of Health Accounts (SHA).** COFOG health expenditures were artificially increased through the duplicate inclusion of certain healthcare expenditures. Eurostat fixed the error in 2020 and revised the data, but only to 2017 and older data thus remaining overvalued. However, SHA does not allow the division of spending according to the ESA categories. The recalculation of SHA expenditures into ESA categories was made using the COFOG health structure and the amount resulting from the difference between COFOG and SHA was deducted from social benefits, as they were previously affected by the duplicate inclusion.

**There are differences between COFOG and SHA that allow better comparisons between countries.** COFOG health expenditures can be divided into two groups. The first one is healthcare targeting individuals. The second one is collective healthcare. SHA follows a "three-axis" pattern in which everything that is consumed has been provided and paid for. Although it also breaks down expenditures by function, the categories are not fully comparable to COFOG. The SHA also differentiates the methods of providing care, namely outpatient, institutional, daily and home care. SHA aims to cover all expenditures related to healthcare. COFOG classifies general government transactions. For this purpose, SHA tracks all economic units, while COFOG only public institutions. This allows SHA to mitigate the problems associated with the different approaches of countries to the classification of hospitals as general government entities. COFOG is strictly limited to government administrative sources, while SHA uses information from both public and private sources. However, the review mainly employs data from the public sector.

**Graph 114: Comparison of health and healthcare spending amounts (average of 2011-2020), % of GDP**

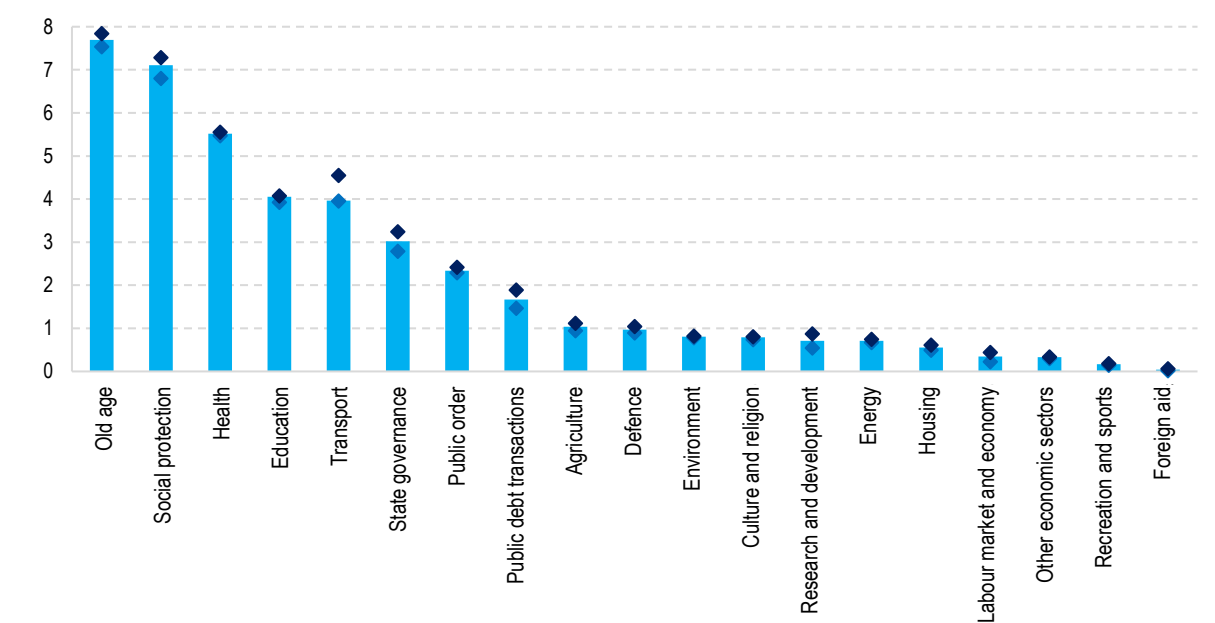


Source: VMU's elaboration based on Eurostat data

## Annex 3 Selection of a suitable period

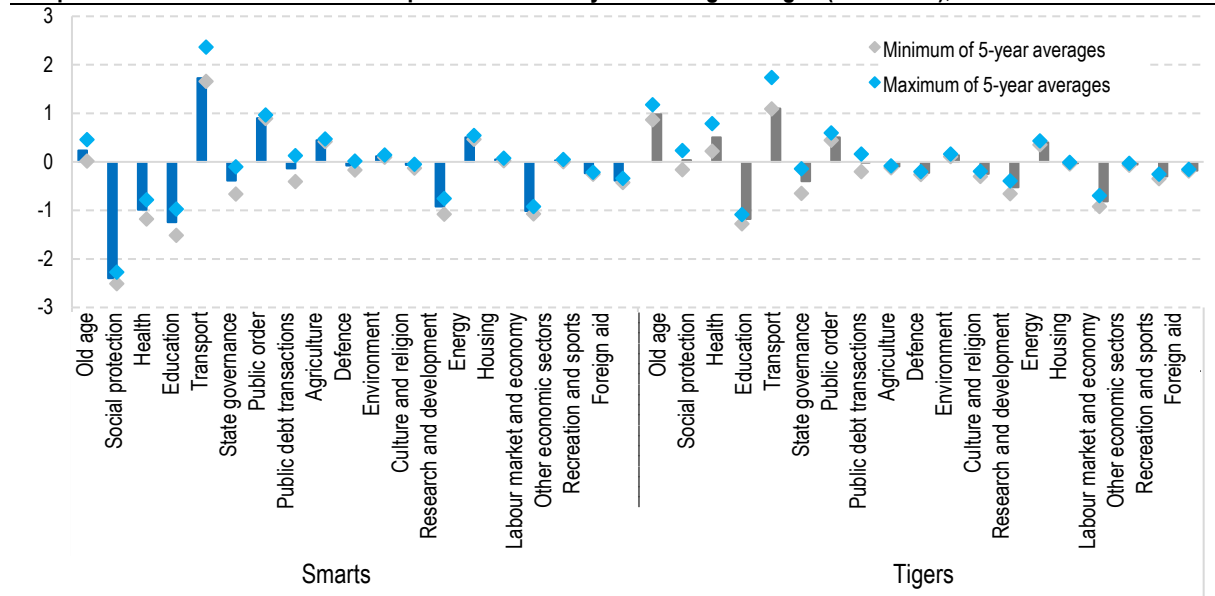
Multi-year averages of expenditures are used mainly because of the volatility of spending in some areas, for example in transport or in research and development. The volatility was mainly caused by the one-off high draw-down of European funds at the end of the programming period. In the following graphs, the moving averages for 5-year intervals between 2011 and 2020 are compared with the average for the whole monitored 10-year period.

**Graph 115: Slovakia's average expenditures (2011-2020) and five-year moving average outliers+, % of GDP**



Source: Eurostat

**Graph 116: Deviation of Slovakia's expenditures and 5-year moving averages (2011-2020), % of GDP**

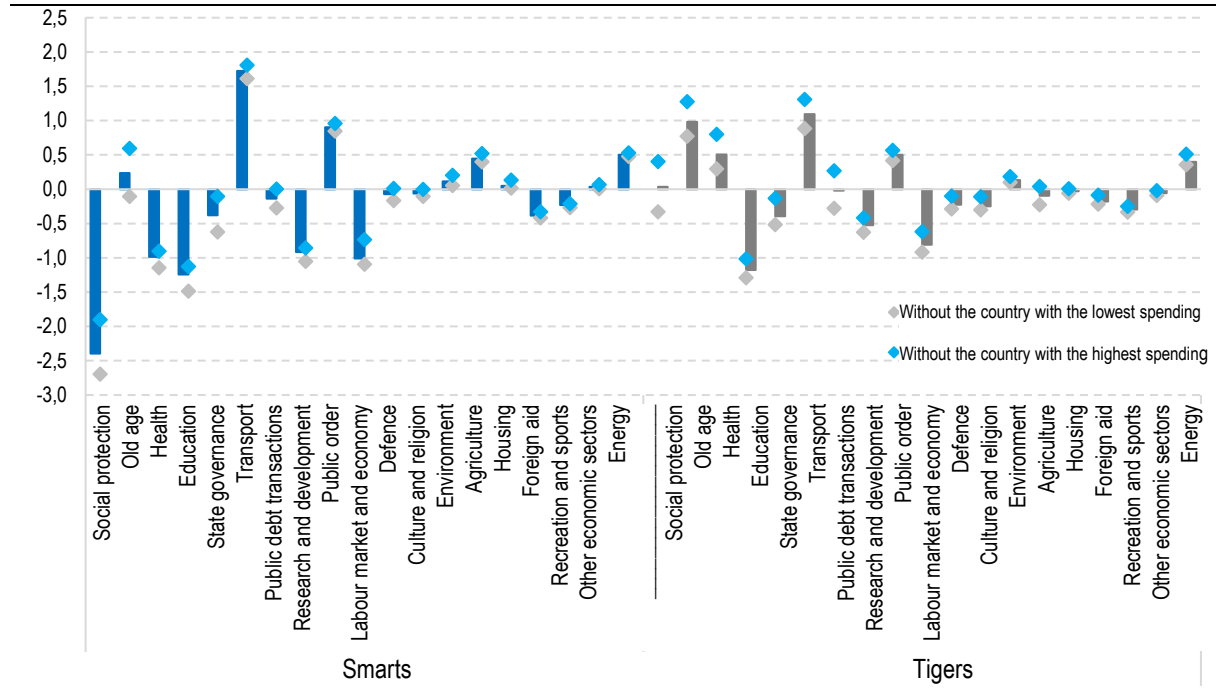


Source: Eurostat

## Annex 4 Sensitivity of the choice of reference groups

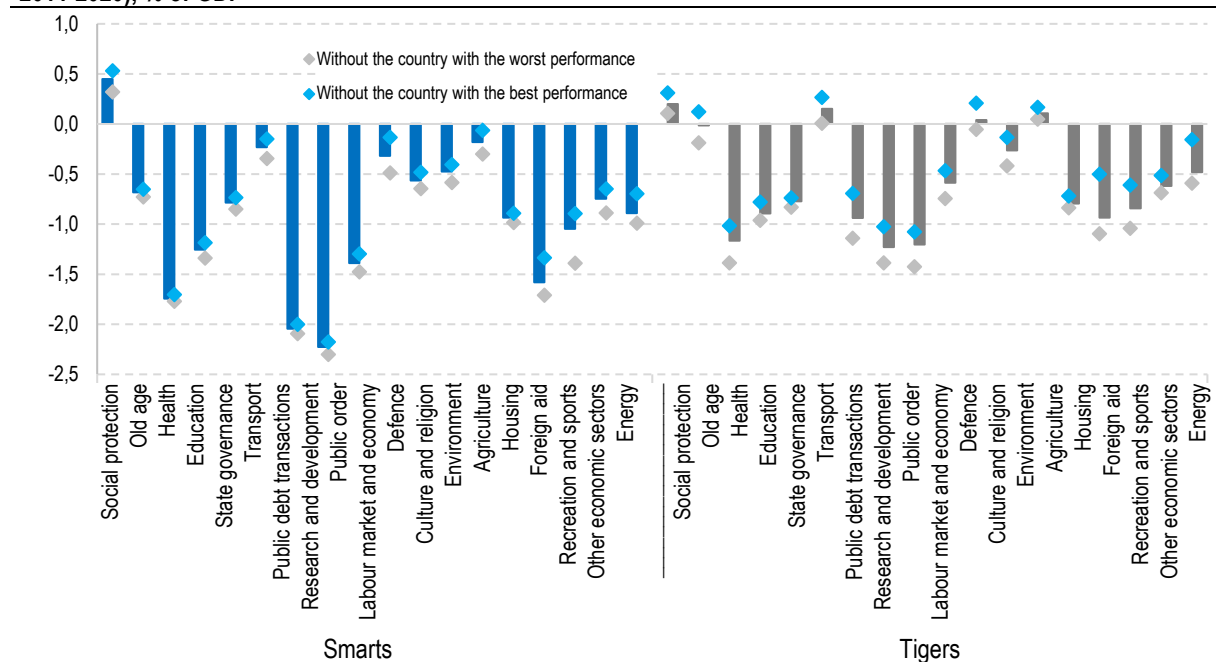
Given the chosen methodology, the selection of a suitable reference group is crucial for the review. Graph 117 and Graph 118 show how the differences in spending and performance between Slovakia change when the countries with the lowest and highest spending levels/worst and best performance are disregarded.

**Graph 117: Sensitivity of the deviation of Slovakia's expenditures from the reference groups (average of 2011-2020), % of GDP**



Source: Eurostat

**Graph 118: Sensitivity of the deviation of Slovakia's performance from the reference groups by area (average of 2011-2020), % of GDP**



Source: Eurostat, IMF, OECD, EU SILC, TIMSS, PIRLS, EIS, processed by VIMU

## Annex 5 DEA methodology

Data Envelopment Analysis (DEA) is an analytical method used to evaluate the efficiency and productivity of organisational units (for example, companies, states). The DEA methodology encompasses a number of steps:

1. **Selection of inputs and outputs** To calculate the efficiency, it is necessary to determine what factors (inputs) affect the performance of the units and what outputs are generated by them. Inputs may include funds, human resources, material, etc., while outputs may be products, services, or other measurable results.

The review uses two types of inputs for each area to increase the robustness of the method. In the first model, the inputs are adjusted public expenditure converted to % of GDP of a specific country and averaged over the years 2011-2020. The second model uses as inputs adjusted public expenditure per capita converted to purchasing power parity (PPP) values and averaged over the years 2011-2020. The first model thus seeks to maintain consistency with the rest of the study, while the second can more accurately express the real amount of resources that the country has invested in a given area. The resulting efficiency of the country is the average of the efficiencies from the two models. For investments, public expenditure inputs are replaced by public capital values of 2019.

The outputs are the composite indicators of an area averaged over a shorter period (2016-2020) during which the impact of the policies of previous years was already visible. The values of each performance indicator were normalised to the percentage of the average of the indicator values across all EU countries, similarly to the literature ([Sarkis, 2007](#)). This can be mathematically expressed as  $I_{ij} = \frac{x_{ij}}{\bar{x}_j}$ , where  $I_{ij}$  is a country's normalised indicator  $i$  for performance indicator  $j$ , and  $x_{ij}$  is its non-normalised value. If the indicator is negative (the higher the number, the worse the result), the numerator and denominator are interchanged in the formula.

The normalisation is, therefore, not fully accurate (for some areas, negative indicators have a slightly higher importance than positive ones), but the accuracy obtained is sufficient for the purposes of the review. In the old age and social protection areas, the values of the “material and social deprivation” and “share of people living in households with very low work intensity” indicators are used with the inverted value, i.e.  $(100 - x)\%$  because of the normalisation approach.

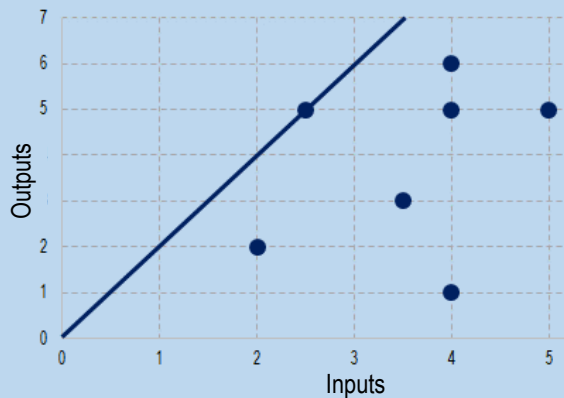
The so-called min-max normalisation ([Antonelli, 2018](#)) is often referred to in literature, which, however, is not suitable for some of the areas covered by this study because of a lower number of indicators. Less productive countries would have extremely low efficiency figures in some sectors, which would not correspond to the traditional understanding of efficiency. The min-max normalisation is, therefore, only used in the model for the whole general government where a higher number of indicators is used. The normalisation based on the so-called z-score which is used in the rest of the study cannot be applied in DEA since the model normally requires non-negative output values.

The normalised indicators are subsequently averaged within the sub-areas into partial composite indicators, which are further averaged to obtain composite indicators for an area (Box 4). Each country is thus eventually assigned only a single output for each area.

2. **Determination of the model alternative** There are several variants of DEA models, the most common being the CCR (Charnes, Cooper, Rhodes) model which uses constant returns on scale, and the BCC (Banker, Charnes, Cooper) model which uses variable returns on scale ([Kuah et. al., 2010](#)).

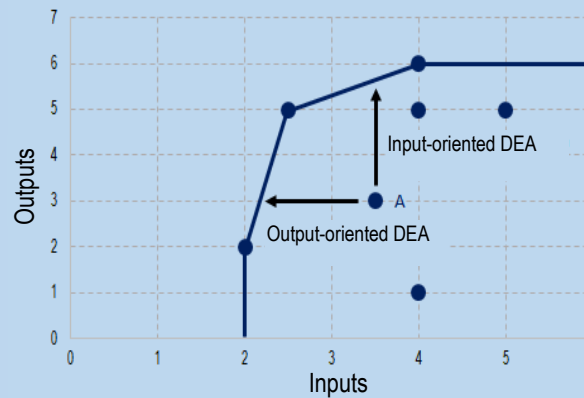
This review employs the BCC model with variable returns on scale, similarly to the literature ([Prasetyo et. Al, 2013](#), [IMF 2015](#)), as it assumes diminishing marginal returns on scale.

Graph 119: CCR model frontier



Source: VfMU's elaboration

Graph 120: BCC model frontier



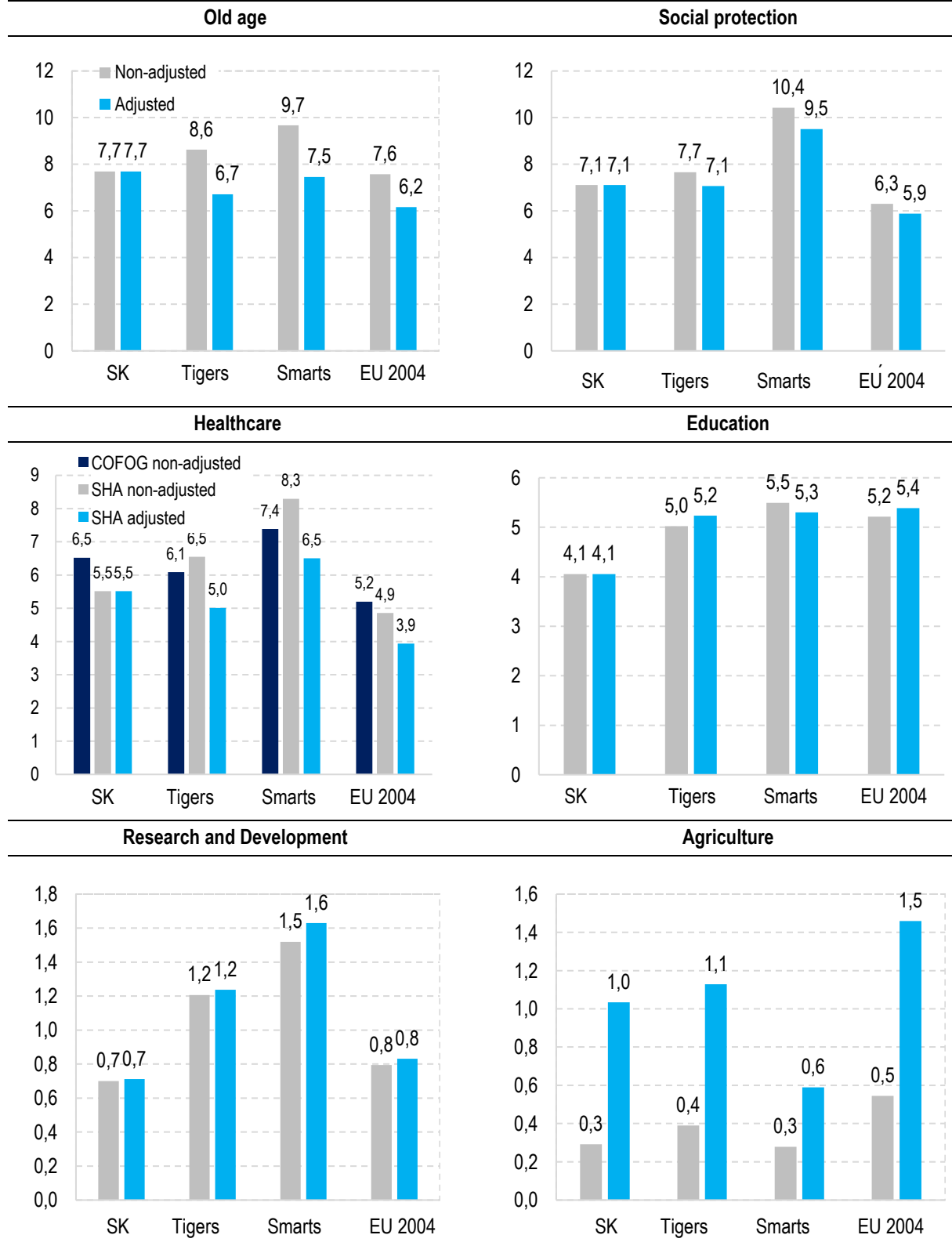
Source: VfMU's elaboration

- Determination of the model orientation** The model is converted into a linear programme that is solved using mathematical methods. The goal is to maximise the output of units with a given amount of inputs (output-oriented DEA), or to minimise the amount of inputs with a given output (input-oriented DEA). This review uses an output-oriented model since our primary goal is to maximise the results we achieve.
- Identification of optimal units** DEA identifies the optimal units that achieve the highest efficiency. These units are called efficient and together they form a frontier that serves as a benchmark for the other units.
- Calculation of efficiency** With output orientation, the efficiency of a unit is determined by the ratio of its distance from the x-axis (BA) and the distance of the frontier from the x-axis at the same inputs (BC). The resulting efficiencies for the individual countries are the average efficiencies of the two models (inputs recalculated on GDP and PPP bases).

## Annex 6 Effect of expenditure adjustments

The adjustment of expenditures is one of the important elements of the analytical approach used in the review. The following graphs compare the effect of adjustments in the individual areas.

**Graph 121: Effect of expenditure adjustments by reference group (average of 2011-2020 average), % of GDP**



Source: Eurostat, processed by VfMU

## Annex 7 List of indicators and Slovakia's performance

The performance indicators used in this study are mostly from the general government budget, and additional indicators are used only sporadically. The general government budget indicators are approved by the Government of the Slovak Republic and the specific ministries responsible for the relevant areas, so there is a considerable degree of political and expert agreement on the indicators. In some areas, however, the General Ledger indicators are not able to measure spending efficiency and, therefore, some of them are replaced by more suitable indicators in the review, for example, low poverty rates after transfers may be a consequence of low poverty rates before transfers. The country would achieve relatively good outcomes even if transfers contributed only marginally to poverty reduction. Therefore, in the social areas of old age and social protection, we monitor the change in the risk of poverty and supplement it with other dimensions of the initial at-risk-of-poverty or social exclusion rate indicator.

**Table 24: Breakdown by selected result indicators by area**

COFOG	Indicator	Used in the study	General Ledger
Housing	Proportion of population with reduced rent		
	Proportion of households' expenditures on housing		
	Number of flats per thousand of population		
	Average number of rooms per person		
	Proportion of households without a flush toilet, shower or bath		
	Proportion of households that could not maintain an adequate temperature all year round		
Transport	Passengers in train transport		
	Proportion of public passenger transport		
	Polluters' emissions from transport		
	Motorway density		
	Proportion of electrified railways		
Energy	Proportion of energy from renewable sources		
	Final energy consumption per inhabitant		
Culture and religion	Proportion of households' expenditures on culture		
	Press Freedom Index		
	Percentage of believers in the population		
Defence	Proportion of defence expenditures on R&D		
	Defence expenditures in % of GDP		
Agriculture	Gross value added per hectare of agricultural land		
	Gross fixed capital formation per hectare of agricultural land		
	Field Bird Index		
	Percentage of land under ecological farming		
	Gross value added in forestry per hectare of forests		
Recreation and sports	Proportion of people reporting recreational sporting in a typical week		
State governance	eGovernment indicator		
	Public trust in the NATO		
	Public trust in the EU		
	National Brand Index		
	Global Passport Power Rank		
	Structural balance		
Social protection	Public debt		
	At-risk-of-poverty or social exclusion rate		
	At-risk-of-poverty or social exclusion rate in children (0 -17)		
	At-risk-of-poverty or social exclusion rate in children (0 -17) of low-skilled parents		
	At-risk-of-poverty after social transfers (0 -64)		
Material and social deprivation (0-64)			
Proportion of people living in a household with a very low work intensity (0-64)			

COFOG	Indicator	Used in the study	General Ledger
Old age	At-risk-of-poverty or social exclusion rate (65+)		
	Change in the at-risk-of-poverty rate after social transfers (65+)		
	Material and social deprivation (65+)		
Labour market and economy	Total employment		
	Employment of low-skilled workers		
	Long term unemployment		
	Employment of women		
	Proportion of young people not in employment or training		
	Proportion of working persons with a serious health impairment in the total number of persons with a serious health impairment at working age		
	Rank in Doing Business		
Public order	Road traffic fatalities per 100,000 of population		
	Perception of independence of judiciary by businesses		
	Perception of independence of judiciary by population		
	Feelings of safety when walking alone at night		
	Number of prisoners per 100,000 of population		
	Number of intentional homicides per 100,000 of population		
Research and development	Trust in the police		
	Average ranking of the best university in the TOP rankings		
	European Innovation Scoreboard, Index		
	European Innovation Scoreboard, Rank		
Education	Proportion of private R&D expenditures		
	Proportion of children in pre-primary education		
	Average scores of 4th graders in TIMSS19 and PIRLS		
	Proportion of pupils below baseline level in PISA reading literacy		
	PISA, overall score		
	Early school leavers (age of 18 - 24)		
	Horizontal mismatch between secondary and tertiary schools		
	Rate of employment of school-leavers		
	Proportion of population with university education (age of 30-34)		
	Participation in education in the working age		
Foreign aid	Average ranking of the best university in TOP rankings		
	State aid amount		
Health	Treatable mortality		
	Infant mortality		
	Preventable mortality		
	Female life expectancy		
	Male life expectancy		
	Life expectancy by education		
Other economic sectors	Fixed broadband usage rate		
	Proportion of households covered by a very high capacity network		
	Number of overnight stays of foreign tourists per inhabitant		
Environment	Population connected to waste water treatment plants		
	Municipal waste recycling rate		
	Reduction of greenhouse gas emissions compared to 1990		
	Average concentration of PM2.5 in air		

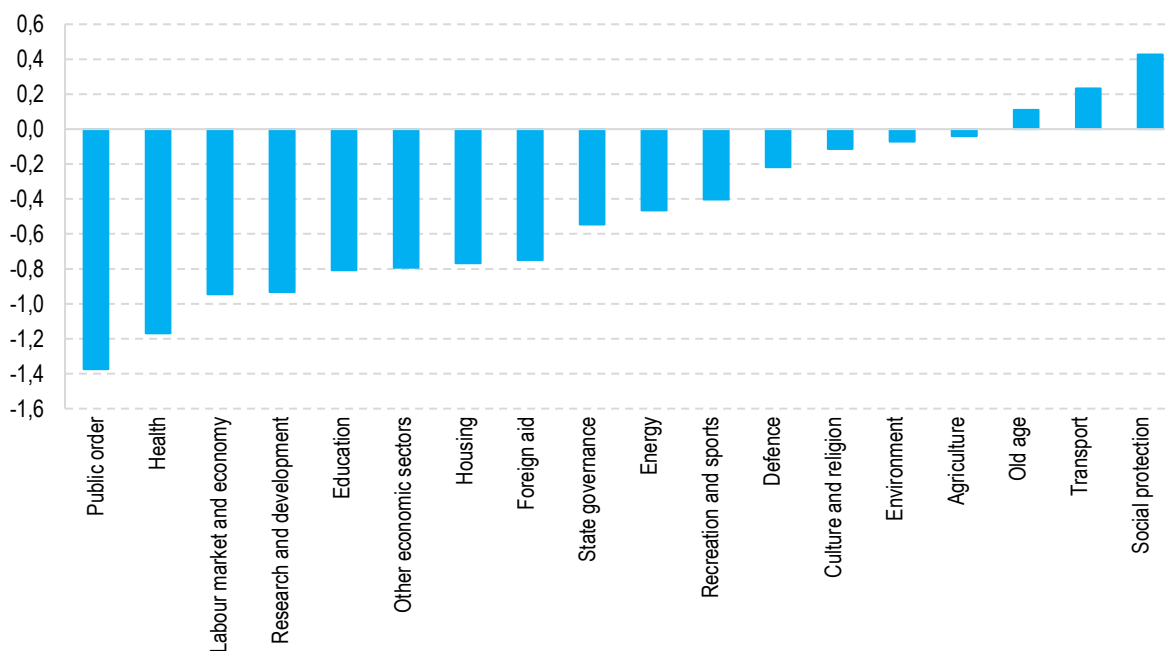
Source: VfMU's elaboration

**The performance in each area is represented by a composite indicator.** The indicators are reassigned to the relevant COFOG areas so that they can be matched with expenditures. Some indicators are assigned to specific sub-areas, but in many cases, this is not possible because one indicator is often influenced by several sub-areas

or even several areas.<sup>45</sup> The composite indicators are compiled using the Reform Compass methodology ([IFP, 2022](#)).

**Slovakia has the poorest performance in the areas of public order, health, labour market and economy, and research and development. In contrast, social protection and transport are the areas with the best results.** With the used methodology, it is possible to interpret all areas with negative z values in Graph 122, such as those where we lag behind the average of the whole EU, and vice versa, all with positive z values where we are ahead.

**Graph 122: Slovakia's performance according to composite indicators**



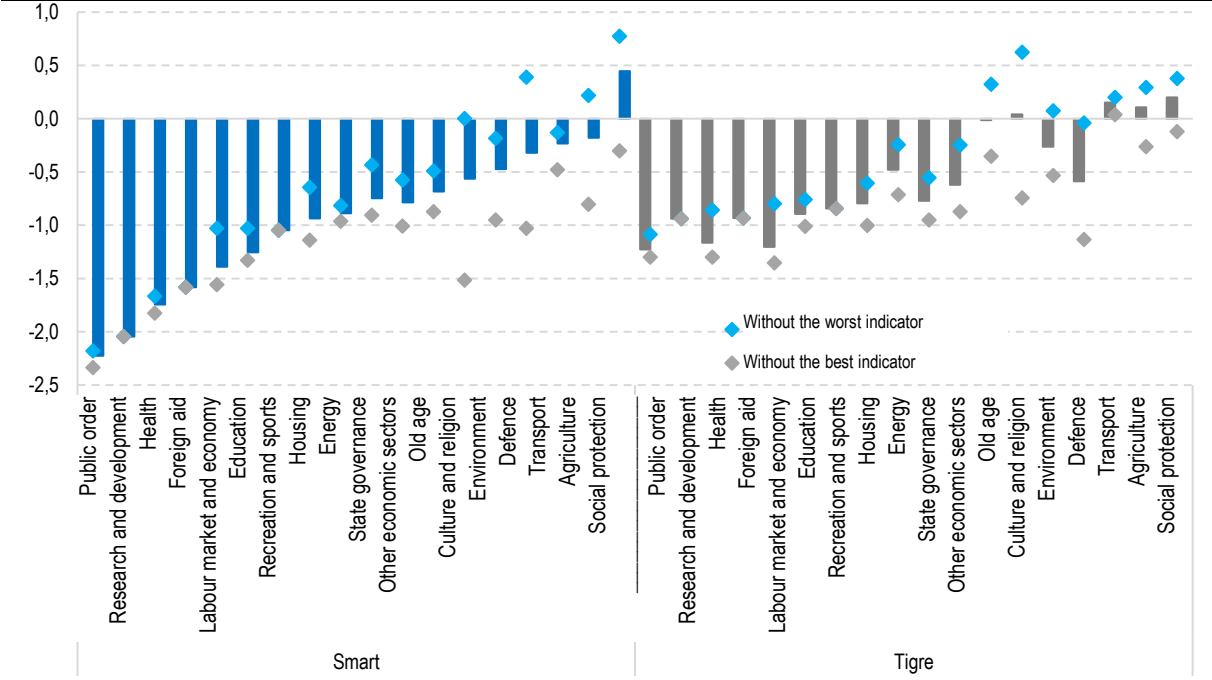
Source: General Government Budget, Eurostat, OECD, processed by VfMU

<sup>45</sup> A specific area is public debt transactions, which include mainly interest on debt. However, they arise as a consequence of policies. Therefore, the area is not among the results.

### Annex 8 Sensitivity of the choice of indicators

The choice of sub-indicators can affect the resulting deviations of Slovakia's composite indicators from the reference groups. Graph 123 shows the consequence of omitting the best and worst indicators. Especially in those areas where the country achieves poor results, there is no significant change in the conclusion that we are lagging behind. However, it is no longer possible to say the same about, for example, culture and religion, old age, or social protection.<sup>46</sup> It is in these areas that it is appropriate to construct composite indicators from several indicators. The choice of only one would significantly affect the observed result.

**Graph 123: Deviations of Slovakia's composite indicators from the reference groups**



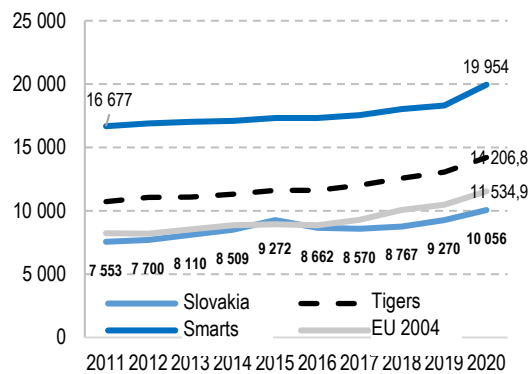
Source: Eurostat, IMF, OECD, EU SILC, TIMSS, PIRLS, EIS, processed by VIMU

<sup>46</sup> Defence is omitted from the calculation for the reason of the nature of data in this area. For the sake of security, many facts are not public, which disables measuring the relevant indicators, such as delivery on the capability targets and the like.

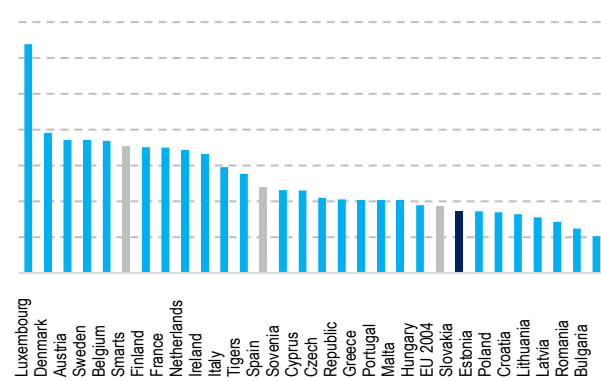
## Annex 9 Expenditure per capita in PPP values

The expenditure per capita based on purchasing power parity (PPP) could, theoretically, be suitable for comparing funding in a specific area. It does not have any significant weight in the review, and this is for two reasons. The first one is that the main purpose of PPP is to determine the value of an output (GDP), i.e. - how many hypothetical goods and services economies can acquire for their product. It is not primarily intended to determine the value of the input. The second, more serious reason is the methodological drawbacks of the application of PPP with which housing prices in Slovakia are overestimated and this causes inconsistency between the time series up to 2015 and the time series after 2015; for more information see [Dujava and Žúdel \(2023\)](#).

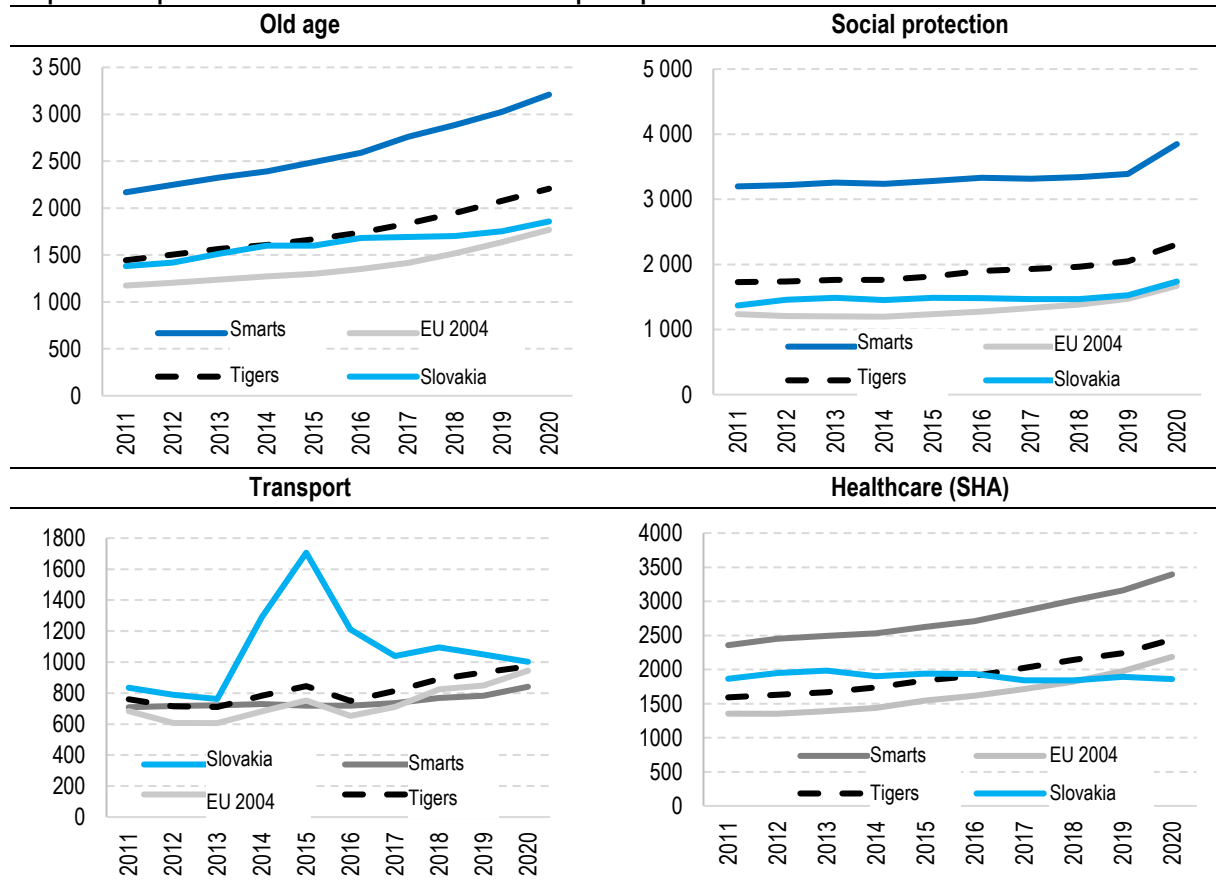
**Graph 123: Development of public expenditures per capita on PPP basis**



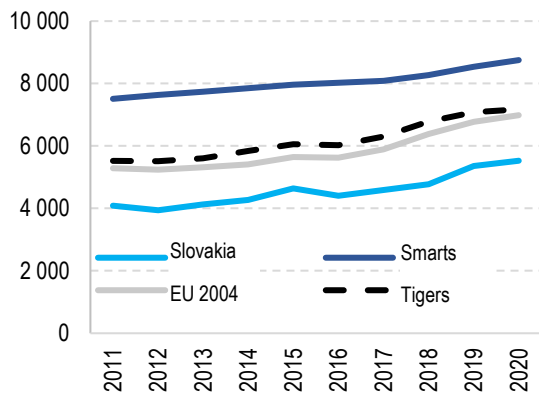
**Graph 124: Public expenditures in EUR thousand per capita on PPP basis (average of 2011-2020)**



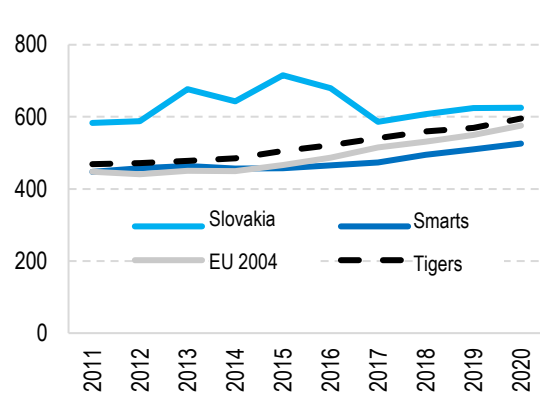
**Graph 125: Expenditures on the areas in EUR millions per capita on PPP basis**



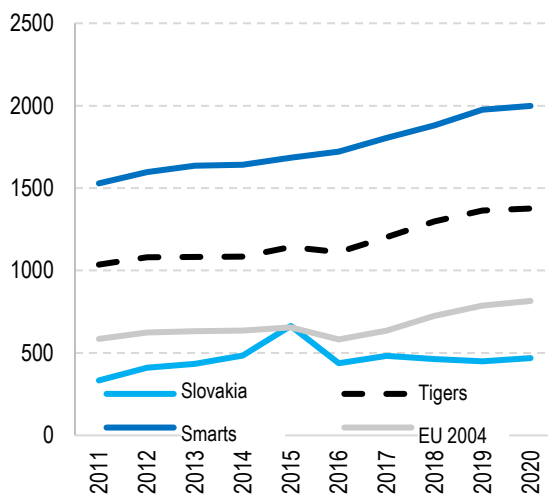
**Education (PPP per number of pupils)**



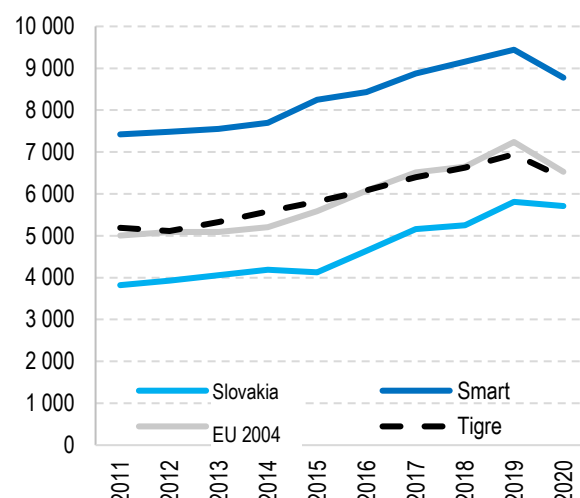
**Public order**



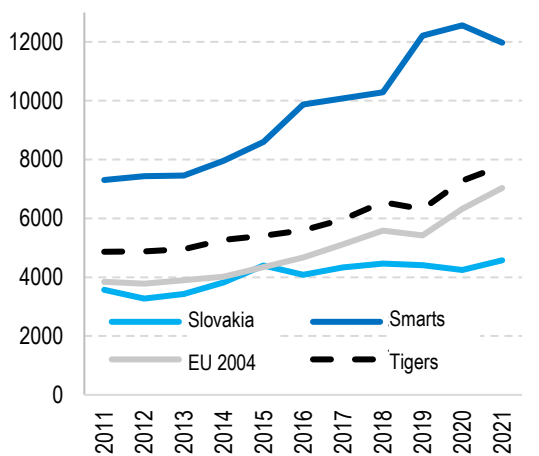
**Security and development (GERD)**



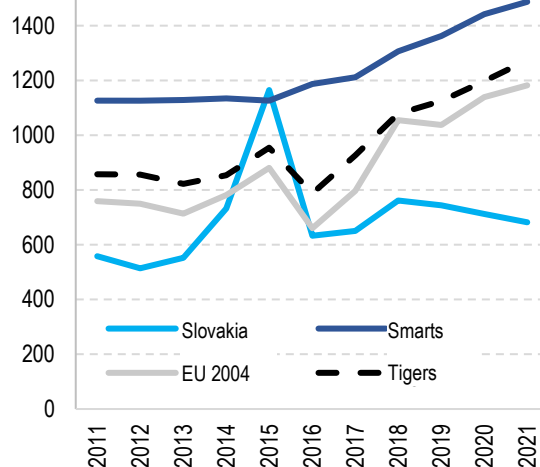
**Salaries and wages**



**Investments**



**Fixed capital**



Source: Own elaboration based on Eurostat, SHA and GERD data

## Annex 10 Results of regression models

**Table 25: Regression model outputs**

<b>Dependent variable: expenditure for the area, % of GDP</b>	<b>Old age</b>	<b>Social protection</b>	<b>Health</b>	<b>Education</b>	<b>Public order</b>
<i>Intercept</i>	-17.410*** (1.960)	4.903*** (1.680)	-1.181 (-0.809)	0.910* (-0.533)	2.895*** (0.141)
<i>HDP_na_hlavu1</i>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)
<i>HDP_sq1</i>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
<i>pop_64</i>	0.576*** (0.055)				
<i>ODZ_65</i>	0.967*** (0.112)				
<i>unem_long</i>		-0.537*** (0.097)			0.016*** (0.005)
<i>unem_low_quali</i>		0.079*** (0.017)			
<i>unem_rate</i>		0.389*** (0.093)			
<i>employment</i>		-7.792** (3.086)			
<i>soviet</i>			0.670** (-0.257)	0.637*** (0.158)	
<i>pop_64_79</i>			0.072 (-0.052)		
<i>pop_80_a_viac</i>			0.348*** (-0.105)		
<i>pop_3_10</i>				1.681 (8.856)	
<i>pop_11_19</i>				1.772 (6.493)	
<i>pop_20_25</i>				34.266*** (5.700)	
<i>pop_15_24</i>					-0.040** (0.012)
<i>crime_rate</i>					-0.046** (0.014)
N	270	270	269	270	270
Adj. R2	0.447	0.591	0.702	0.321	0.671

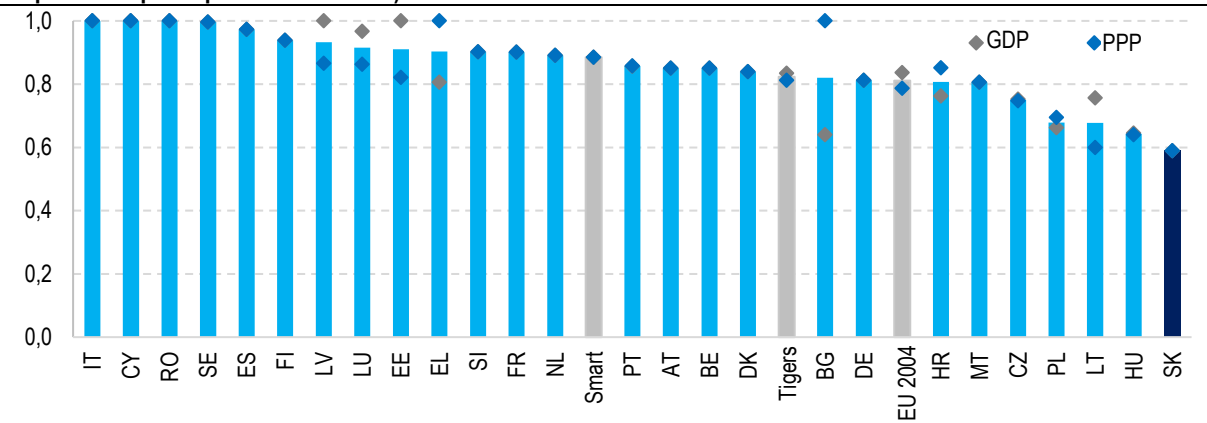
Note: OLS, robust errors in parentheses, signs \*, \*\*, \*\*\* indicate a significance level of 10, 5 and 1%

**Table 26: List of variables**

<b>Code</b>	<b>Label</b>
<i>krajina</i>	Country code
<i>krajina cele</i>	Full country name in EN
<i>rok</i>	Year in double (numeric) format
<i>Staroba</i>	Old age expenditures (% of GDP)
<i>Soc_ochra</i>	Social protection expenditures (% of GDP)
<i>Zdravie</i>	Healthcare expenditures (% of GDP)
<i>Edu</i>	Education expenditures (% of GDP)
<i>Ver_por</i>	Public order expenditures (% of GDP)
<i>HDP_na_hlavu1</i>	GDP per capita, real
<i>HDP_sq1</i>	<i>HDP_na_hlavu1</i> x <i>HDP_na_hlavu1</i>
<i>pop_64</i>	Proportion of the population aged 64+
<i>ODZ_65</i>	Estimated life expectancy at 65 years of age
<i>unem_long</i>	Long-term unemployment
<i>unem_low_quali</i>	Low-skilled unemployment
<i>unem_rate</i>	Proportion of unemployed persons
<i>employment</i>	Employment per population (0-65)
<i>soviet</i>	Dummy variable, 1 = former Eastern Bloc countries, 0 = other, Germany = 0
<i>pop_64_79</i>	Proportion of the population aged 64-79
<i>pop_80_a_viac</i>	Proportion of the population aged 80+
<i>pop_3_10</i>	Proportion of the population aged 3-10
<i>pop_11_19</i>	Proportion of the population aged 11-19
<i>pop_20_25</i>	Proportion of the population aged 20-25
<i>pop_15_24</i>	Proportion of the population aged 15-24
<i>crime_rate</i>	Intentional homicides per 1,000 inhabitants, recorded acts

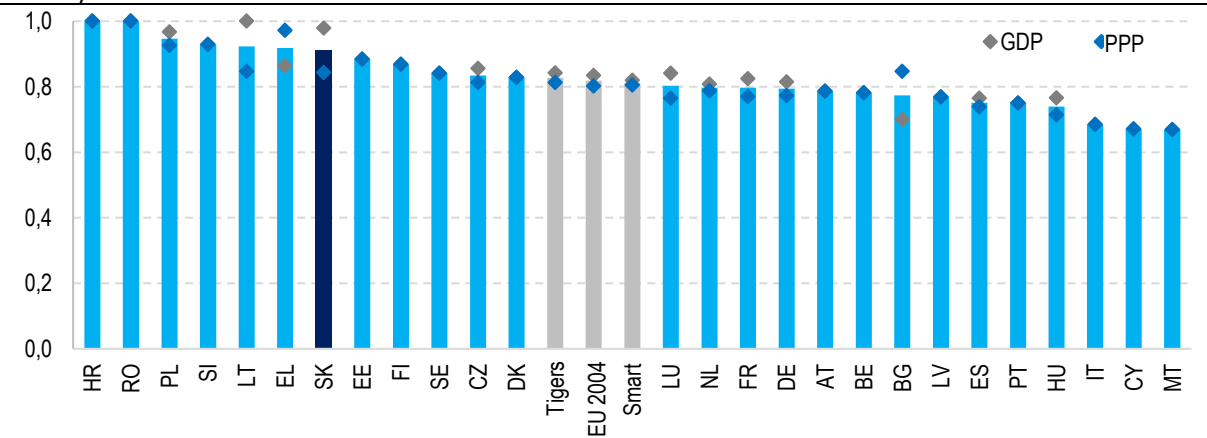
## Annex 11 Alternative DEA regression models

**Graph 126: Efficiency in education, public and private expenditures (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, OECD, processed by VfMU

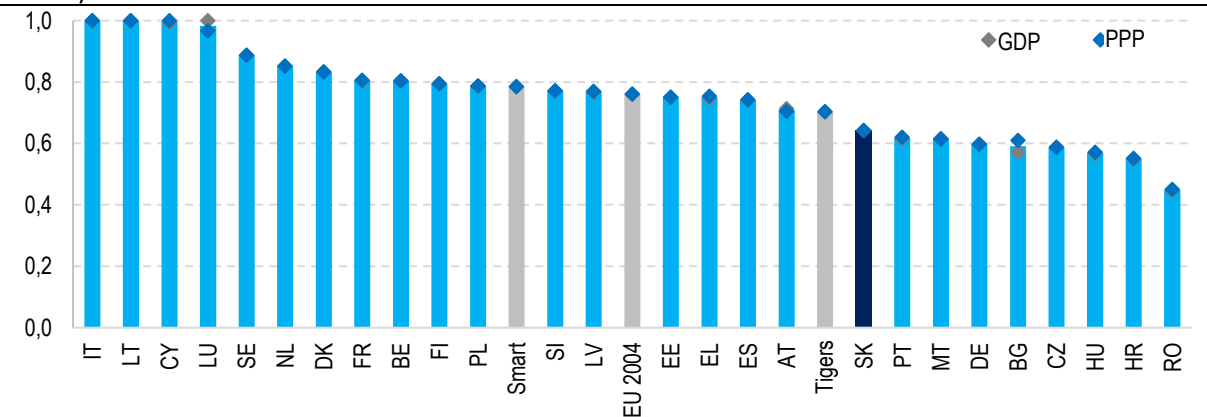
**Graph 127: Efficiency in regional education (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Regional education includes the pre-primary, primary and secondary levels.

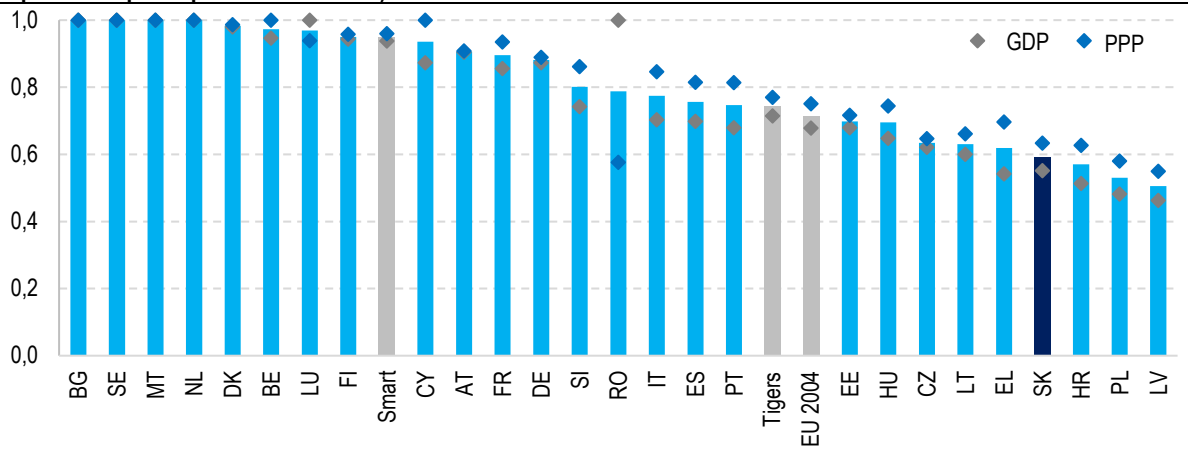
Source: Eurostat, OECD, TIMSS and PIRLS, processed by VfMU

**Graph 128: Efficiency in tertiary education (inputs as percentage of GDP and as expenditure per capita in PPP values)**



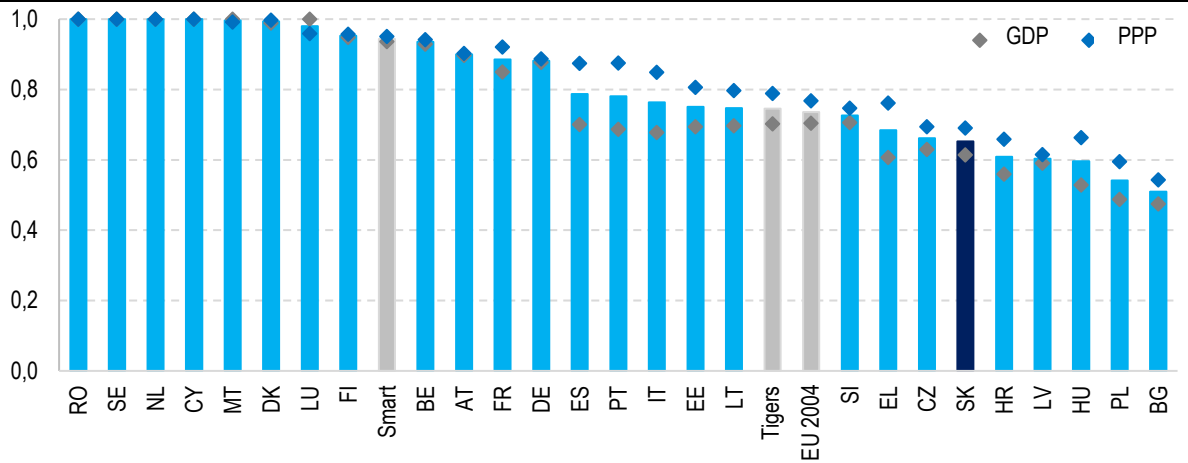
Source: Eurostat, processed by VfMU

**Graph 129: Efficiency in R&D, GBARD public and private expenditures (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, EIS, processed by VfM

**Graph 130: Efficiency in R&D, GERD public and private expenditures (inputs as percentage of GDP and as expenditure per capita in PPP values)**



Source: Eurostat, EIS, processed by VfM

## Annex 12 Investment gap by area and by target achievable by closing the gap

Area	Target	Gap estimate in EUR million	Calculation
<b>Total investment gap</b>		<b>46,326</b>	<b>Rough calculation of the investment gap; the methodology used varies by area.</b>
Completion of motorways	Completion of motorways with an international commitment	8,063	The sum of the costs of the planned motorways to be constructed within the framework of international commitments (for details regarding motorways see <a href="#">Road Infrastructure Construction Priorities</a> )
Renovation of state buildings	Renovation of all state buildings in an unsatisfactory condition	6,775	The unit cost of renovation per square meter is almost EUR 1,200 with VAT, and for historical buildings over EUR 1,500 with VAT. The assumed extent of renovation is 75% (Recovery and Resilience Plan, 2021: 31) of state buildings and approximately 10% of the floor area of six million m2 is in unheated spaces. For details see " <a href="#">Prioritisation of the renovation of state buildings</a> ".
Modernisation of railways	Revitalisation of tracks with a service life of up to 10 years	6,501*	The calculation includes only track sections with a BCR above 1 based on the strategic CBA and the busiest tracks. The costs were included in the estimate to the inevitable minimum extent; for example, all railway tracks are included, but for station tracks only those serving frequent regular traffic operations are included. These costs were estimated for all track sections on the basis of unit prices of the individual infrastructure elements (details of estimation approach can be found in the strategic CBA for the determination of the potential of tracks).
	Revitalisation of tracks with a service life of up to 10 years and modernisation of TENT-T corridors	12,094	Costs of the renovation of the busiest track sections with a BCR above 1 and projects within the TEN-T core network which must be constructed by 2030 in order for Slovakia to meet its international commitments. The costs were included in the estimate to the inevitable minimum extent; for example, the track tracks are all included, but the station tracks only serve for frequent regular traffic operations. These costs were estimated for all track sections based on the unit prices of the individual infrastructure elements.
Comprehensive renovation of state hospitals	Comprehensive modernisation of the institutional healthcare network	4,661	Estimated costs of the comprehensive renovation of the majority of state hospitals (17) calculated on the basis of the current number of beds (12,596) and the current reference unit cost of renovation per bed after the RRP review (EUR 370,056 with VAT). The assumed necessity of the renovation of most hospitals follows from their long-term underfunding.
Defence	Achieve the annual defence commitment of 2%	3,208	The difference in the defence spending potential (if Slovakia had spent 2% of GDP annually on defence since 2004) vs. the actual spending (with a division into investments and operation). The amount of EUR 3.2 billion represents only investments.
Renovation of class I roads	Reinstatement of class I roads to a condition meeting the basic traffic standard	3,175	The estimate is based on the length of roads in an unsatisfactory condition and the cost of renovation per kilometre of road. According to the SSC, 1400 km of class I roads are in an unsatisfactory and emergency condition. The transport spending review estimates the cost of renovation pre kilometre of road at EUR 1.5 million (without VAT, at the 2020 price level). Data from the <a href="#">Road Infrastructure Construction Priorities</a> .
Sewer and water supply systems	Completion of the construction of sewers and water supply lines	3,063	Sewer system The calculation of the investment need is taken from the <a href="#">Public Sewer System Development Plan</a> of the Slovak Republic for the Years 2021-2027 and the <a href="#">Prioritisation of Investment Projects Managed by the Ministry of the Environment of the Slovak Republic</a> .

			Water supply systems: In 2018, public water supply lines were at least partially constructed in 2,419 municipalities, which means that access to public water supply is completely missing in 463 municipalities. Calculation from the <a href="#">Public Sewer System Development Plan of the Slovak Republic for the Years 2021-2027</a>
Environmental burdens	Remediation of all confirmed environmental burdens	2,186	Costs estimated on the basis of the IEP study " <a href="#">Ako sa zbaviť najdrahších hrozieb pre životné prostredie</a> " [How to get rid of the most expensive threats to the environment]. The unit costs of past projects implemented under the Environmental Quality Operational Programme (EQOP) were used for the rough estimate. The unit costs were calculated separately for the individual types of burden according to the type of activity that caused the pollution.
Sewer and water supply systems	Completing the sewer and water supply systems in high priority areas	1,225*	Sewer system For waste water, the investment needs of high-priority projects amount to EUR 635 million. High priority is put on municipalities of agglomerations with over 2000 population equivalent, municipalities in protected water management areas and those in which a sewer system has already been under construction; this follows from the Slovak Republic's commitments. The calculation of the investment need is based on the Public Sewer System Development Plan of the Slovak Republic for the Years 2021-2027 and the Prioritisation of Investment Projects Managed by the Ministry of the Environment of the Slovak Republic. Water supply systems: In 2018, public water supply lines were at least partially constructed in 2,419 municipalities, which means that access to public water supply is completely missing in 463 municipalities. The investment need is EUR 657 - 985 million. Of that, investments in the amount of EUR 287 million are of high priority (but this amount is supposedly available). The data are taken from the Public Sewer System Development Plan of the Slovak Republic for the Years 2021-2027.
National cultural monuments (NCMs)	Renovation of all NCMs owned by the state or municipalities that are damaged or in a condition of disrepair	1,852*	The investment gap for monuments is calculated on the basis of the number of monuments of a given type multiplied by the average amount of the contribution for the repair of immovable monuments allocated from the EU funds earmarked for the restoration of monuments in the years 2007-2013, weighted according to the structural and technical condition of a monument (0.66 [damaged] and 1 [in disrepair]). The higher of the two available international benchmarks for monument restoration costs (EU funds and Norwegian funds) was used.
National cultural monuments (NCMs)	Renovation of all NCMs owned by the state or municipalities whose condition so requires	2,583	In the <a href="#">Culture Spending Review</a> , the investment gap for monuments is calculated on the basis of the number of monuments of a given type multiplied by the average amount of the contribution for the repair of immovable monuments allocated from the EU funds earmarked for the restoration of monuments in the years 2007-2013, weighted according to the structural and technical condition of a monument (0,33 [satisfactory], 0.66 [damaged] and 1 [in disrepair]). The higher of the two available international benchmarks for monument restoration costs (EU funds and Norwegian funds) was used. The gap for monuments slightly overlaps with the "renovation of all state buildings in an unsatisfactory condition" gap and we estimate this overlap at minimal values.
Schools and kindergartens	Provision of additional kindergarten and primary school capacities to eliminate the two-shift operation of primary schools and debarrierisation of secondary schools	398	In order to fully give effect to the legal right to a place in kindergarten for all children from the age of 3 and ensure that the lack of places in kindergartens does not hinder schooling, it will be necessary to build 13 thousand places for children in kindergartens. The average expenditure per place in projects financed from IROP in the programming period 2014-2020 serves as a benchmark cost of creating one place in a kindergarten. To eliminate the current two-shift operation, it is necessary to build 220 classrooms in 49 schools (approx. EUR 181,000 per classroom, which sum is proportionally reduced amount based on the average class size in two-shift operation). The cost of debarrierisation per school was estimated based on an implemented project and according to schools' data concerning their debarrierisation. The investment need is EUR 135.4 million to extend the capacities of kindergartens + EUR 65 million for the debarrierisation of secondary schools + EUR 123.3 million termination of two-shift operation, which totals EUR 323.7 million (EUR 398.2 million after indexation). <a href="#">The Data are based on the Recovery and Resilience Plan of the SR.</a>

Replacement of vehicle fleets	Replacement of general government vehicles with expired service life	120	Calculation based on the current state of vehicle fleets in the general government. Even with this gap closed it will still be necessary to invest annually in the continuous replacement of the vehicle fleet. The calculation is based on the fuel consumption costs paid from the state budget, average vehicle consumption and annual mileage. The estimated percentage of vehicles that require replacement is based on the <a href="#">Vehicle Renewal Plan of the Ministry of the Interior of Slovak Republic</a> .
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\*The costs are not included in the total investment gap: a different target was selected for the area and the calculation of costs would be duplicated.

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