The Poor City of Prague?

Prague's public finances
in the Czech and international context

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The Poor City of Prague?
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The City of Prague has long struggled with the issue of financing strategic infrastructure projects and other city operations. This analysis titled "The Poor City of Prague? Prague's Public finance in the Czech and International Context" was created at the Strategy and Policy Section of the Prague Institute of Planning and Development during the second half of the year 2019 at the request of Pavel Vyhnánek, Deputy Mayor for Finance and Budget. It aims to improve the understanding of the issues of public finance, infrastructure investments, and the economic situation and position of the City of Prague in the Czech Republic and Europe[1].

The publication consists of three sections.

The first section, ***"How Wealthy is Prague from Various Perspectives? A comparison of economic development indicators and the impact of territorial definitions"***, raises the question whether Prague is really as wealthy as it appears from the perspective of the most commonly applied macroeconomic indicator - GDP - and what would be the result if we applied other macroeconomic indicators or different geographic definitions of the Prague metropolis.

The second section, ***"What is Prague's Position in the Czech Republic? Prague´s access to national funds"***, analyzes the position of Prague particularly with regard to the budgetary allocation of taxes (BAT) to other regions and municipalities in the Czech Republic.

The third section, "How public and local financing systems work and who pays for construction of strategic transportation projects? A comparison of funding for cities and strategic transportation infrastructure", is a comparative study of Prague and similar European cities[2]. It examines the public finance systems of 23 countries[3] and compares funding for 14 cities[4] and 33 strategic transportation projects[5].

Each section begins with a summary of the main conclusions, which are then given in detail.

The third section of the analysis is supplemented with 30 overview cards containing detailed information about individual cities. Each card begins by summarizing the population and economic data of the given city and contains three types of information: (1) the local public finance system in the given country, (2) the structure of public finance in a specific city, and (3) the way of funding certain specific strategic infrastructure projects[6].

The Strategy and Policy Section team at the Prague Institute for Planning and Development would like to thank all the cities, transportation companies, road infrastructure managers and others for their cooperation in preparing this analysis. We thank Ondřej Gabaš and Eliška Bradová from the Office of the Deputy Mayor of Prague for Finance and Budget for their continuous feedback and cooperation and Lucie Sedmihradská for her expert consultation.

1 /
We examined public financing and financing for infrastructure construction in one non-European city, Seattle, Washington, in the United States.

2 /
Identical to footnote 1..

3 /
Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Croatia, Italy, Lithuania, Latvia, Hungary, Germany, Netherlands, Poland, Portugal, Austria, Romania, Slovakia, United States of America, Serbia, Spain, Sweden, and Switzerland.

4 /
According to research conducted in relevant cities by the Office and Strategy and Development (based on final reports in 2018).

5 /
A total of 33 transportation infrastructure projects: 14 new lines or extensions of existing subway lines and 19 new other types of infrastructure projects (mostly ring roads).

6 /
Given the available information it was not possible to complete all cards 100 %. City cards: Amsterdam, Barcelona, Belgrade, Berlin, Bratislava, Budapest, Bucharest, Zurich, Hamburg, Helsinki, Copenhagen, Lisbon, Lyon, Madrid, Milan, Munich, Nuremburg, Porto, Prague, Riga, Rome, Seattle, Sophia, Stockholm, Tallinn, Warsaw, Vienna, Vila Nova De Gaia, Vilnius, Zagreb.

Contents

How Wealthy Is Prague from Various Perspectives?

A comparison of economic development indicators and the impact of territorial definitions

1.1 Summary of Section 1 – Conclusions

Prague is one of the ten richest regions in the European Union: its GDP per capita is 187% of the European average. The picture becomes complicated, however, if indicators other than economic performance are applied. Measured according to work productivity, Prague is just slightly above the European average, while household income is only average. Regardless of the reasons, GDP shows Prague's economy in a more positive light than other valid macroeconomic indicators.

One of the reasons may be the definition of the territory of Prague under which these indicators are usually monitored. This territory does not cover the entire metropolitan area of Prague; estimates of GDP of the metropolitan area, including those areas from where people commute to the city, would place Prague into the upper fifth of the most economically productive regions, but not at the top. Measured the same way, work productivity for the city's territory is again roughly at European average.

What would the data look like if we "redrew" Prague so that its city limits and statistics better reflected reality? If we deliberately merged the City of Prague with the Central Bohemian Region, the resulting region´s GDP would equal to 134% of the European average. (In terms of eligibility for receiving European subsidies, Prague would gain nothing, and the Central Bohemian Region would lose). If we only added Prague-East and Prague-West districts, then we would arrive at 167% of the European average (compared to 138% in the functional area according to the OECD). In practice, it would be unrealistic to make these changes in territorial definitions because of eligibility for European funds, but the theoretical results help us to better understand the economic situation of Prague.

1.2 Motivation and Questions

1.2.1 STUDY TASKS

Prague has long been ranked as one of the most productive regions in the European Union. Macroeconomic indicators based on GDP are the basis for determining the eligibility for EU subsidies. Certain factors used for calculations, including methodology, can potentially influence the drawing down of these resources. Macroeconomic indicators assessed in isolation may only provide one perspective on the wealth of a city and its residents and may not always illustrate the actual economic level.

- To what degree can any problems (discrepancies) in calculations also affect Prague's approach to drawing down the EU subsidies?
- What possible solutions exist for Prague in calculating economic performance so that Prague has better access to drawing down of funding from the state budget and EU sources, especially to finance strategic transportation projects (subway, ring roads)?
- With respect to characterizing the city's wealth, which indicators should Prague start using and monitoring to have truly accurate information?

1.2.2 WHY AND HOW TO TAKE INTEREST IN PRAGUE'S ECONOMIC PERFORMANCE

Discussions concerning measuring and calculating the degree of development of cities and regions are typically done in the context of several public policy objectives:

- Understanding how a city is developing and whether we can properly measure its development,
- Allocating national funds to various territorial areas,
- Allocating European funds and determining eligibility for their use.

While the task asssignment focuses on objectives 2 and 3, discussion in this document should also be relevant to the first objective. It may also be the case that arguments relevant to the first policy objective may not be suitable from the city's perspective in the context of other objectives: in the context of BAT, cities have an incentive to argue for increasing the role of GDP in fund allocation, while in a European-wide comparison, they may be motivated to emphasize the problematic nature of GDP as a tool for subsidy allocation.

In all three cases, discussions typically involve two dimensions in assessing an area's development: the suitability of using individual development indicators and the suitability of defining the area for which indicators are calculated. The first dimension typically first considers the relative suitability of individual macro and microeconomic indicators and then the need and applicability of non-financial indicators such as the quality of life index (for example, the OECD Better Life Index) or human development index.

1.3 Welfare and Economic Performance Benchmarks

In this section, macroeconomic data is used to discuss various perspectives on the economic performance of Prague and how it compares with other European cities and regions. As indicated by the study task, it is necessary to determine whether GDP is a suitable indicator of a city's wealth. There are two reasons to doubt this: first, GDP doesn't necessarily need to reflect the standard of living of a city's population; second, calculating GDP per capita may be complicated by how the area of Prague is defined.

The left panel of the graph below shows what a city's welfare looks like through the lens of various indicators. We compare the economic level of Prague measured according to:

- GDP per person (in purchasing power parity),
- productivity (per employee),
- net disposable income of households (measured by the average per household).

At the national level, it would make sense to also compare gross national income, which is basically the GDP cleaned of payment balance; however, this quantity is not statistically traceable at regional level. Likewise, cleaning up the economic variables of regional price levels would be appropriate, but similarly, these are not available from official sources.

1.3.1 PRAGUE AND OTHER NUTS2 REGIONS (NOMENCLATURE OF TERRITORIAL UNITS FOR STATISTICS)

In all cases, we compare Prague with other NUTS2 regions in the EU (in the Czech Republic, NUTS2 are “regions of cohesion”). For clarity, values are normalized, i.e. a 100% level corresponds to the (unweighted) average of the regions displayed. The position of the region on the vertical axis indicates the value of the indicator for the given city compared to all NUTS2 regions in the EU.

GRAPH 1 / **NOT JUST GDP: ECONOMIC PERFORMANCE OF PRAGUE COMPARED TO EU REGIONS**

100% = AVERAGE INDICATOR IN GROUPS OF REGIONS/METROPOLITAN AREAS

Source: Eurostat and OECD, data from 2016–2017. London removed to improve readability.

Compared to other indicators for Prague, GDP clearly moves the city up significantly among the economically most productive, but when productivity and household disposable income are used as the main indicators, Prague tends towards the average of European regions. Looking at points depicting other regions, it is also clear that the other two indicators do not show such variance at the upper edge of the distribution, i.e. we see less extremely high values. Both productivity and disposable income adjust GDP by considering labour in creating added value and eliminating the effects of intra-company, cross-border financial transfers. Productivity is also tied to the employees of a given territory and less prone to overestimation of GDP as a result of workers commuting to cities where they contribute to GDP but are not included in the calculation of GDP per capita.

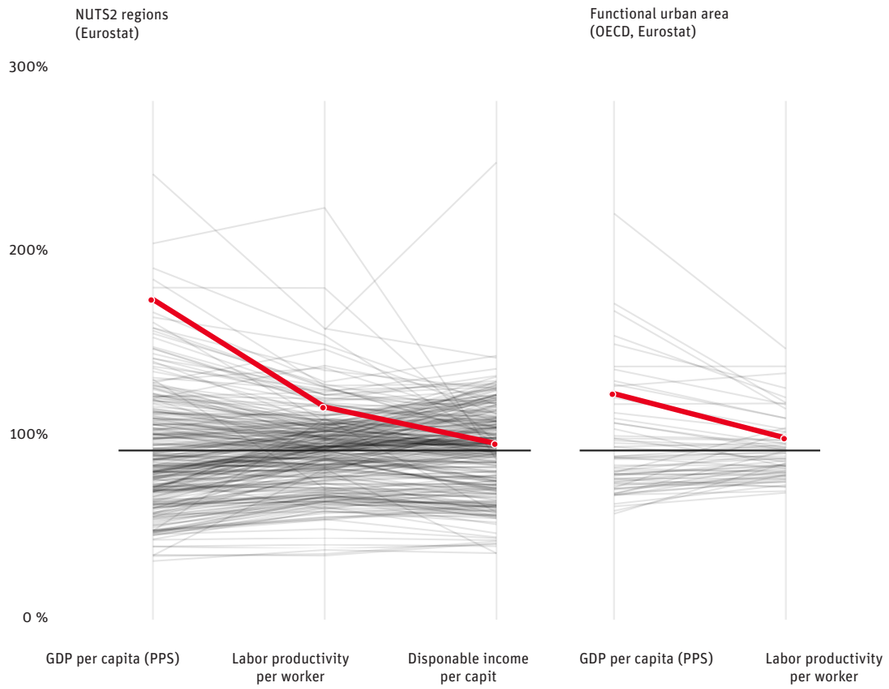
1.3.2 FUNCTIONAL URBAN AREAS

The right-hand panel of Graph 1 above should be noted. This shows a comparison similar to the left-hand panel, but instead of regions, it shows “functional urban areas”. These are defined uniformly for all cities, and specifically include all outlying areas where more than 15% of the population commutes to the given city for work. This definition of a city’s territory eliminates the differences created by purely administrative borders or other descriptions of urban commuting. Here again, this adjustment clearly removes some atypically high values (for Prague as well). Here, Prague shows GDP per capita at around 130% of the average of other European agglomerations, compared to 178% of other European regions in the left panel. It is also clear that in terms of work productivity (per employee), Prague is lower in the ranking of European agglomerations than in a comparison based on GDP.

Graph 2 (shown below) converts this data into an explicit comparison using decile order, showing that Prague has a higher GDP per person than 95% of European regions, but among agglomerations, it is in the 85th percentile. The opposite is true for productivity: Prague-City and Prague-agglomeration may be ranked lower on the productivity scale than the GDP scale, but compared to agglomerations, they perform better (76) than other NUTS2 regions (63). This may indicate the relatively stronger suburbanization of the economy (or, seen from the other side, more artificial administrative boundaries), where the territory of Prague is, in terms of productivity, relatively more economically productive than the territory of other agglomerations.

GRAPH 2 / **NOT JUST GDP: ECONOMIC PERFORMANCE OF PRAGUE COMPARED TO EU REGIONS**

PERCENTAGE RANK OF PRAGUE IN NUTS2 REGIONS AND FUNCTIONAL URBAN AREAS



Source: Eurostat and OECD, data from 2016–2017. London removed to improve readability.

1.4 GDP and Territorial Definition

The previous section showed how the relative economic performance of Prague changes when the entire agglomeration is included in the comparison. This section explores the second dimension of the discussion in greater depth: the territorial definition and its impact on the subsequent indicators of economic development. Specifically, we study GDP per capita, since this metric is relevant in determining eligibility for European subsidies.

1.4.1 FUNCTIONAL TERRITORY: CITIES, REGIONS, AREAS

In the previous section, we suggested that to assess the economic development of a city, it is better to measure GDP for a functional area rather than according to existing administrative boundaries. For the Czech Republic, we will highlight several scenarios that let us measure GDP for a broader area than the city proper by adding municipalities and regions.

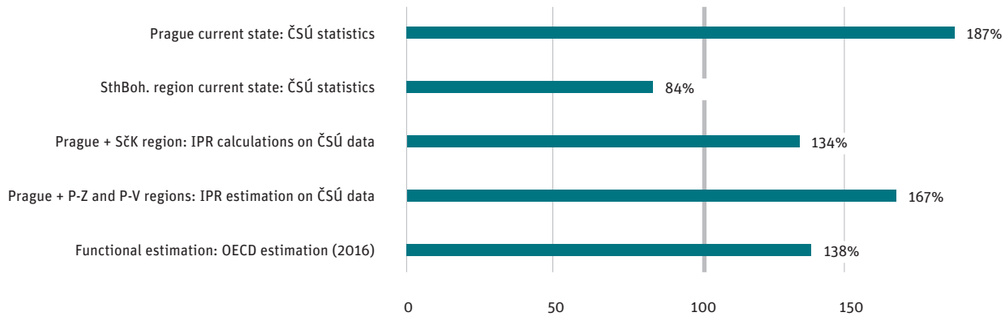
1 Hypothetical merger of Prague with the Central Bohemian Region: this variant is the simplest with respect to data availability and ease of comprehension, but a major part of the Central Bohemian Region is not a functional part of the Prague agglomeration; neither the FUA definition from the OECD nor the definition of the Prague metropolitan region used for cohesion policy purposes encompasses the whole Central Bohemian Region.

2 Inclusion of the Prague-East and Prague-West districts: this definition follows at least some of the existing boundaries (districts), but unfortunately, macroeconomic aggregates are not available for these units; the estimates given in the Graph 3 below assume the same economic level for all districts of the Central Bohemian Region.

3 Functional area according to OECD methodology: here, the methodology of defining urban areas has been developed in cooperation between OECD and Eurostat, but the GDP of these areas is derived from estimates based on data from individual municipalities included in respective functional areas. This GDP estimate is problematic, while emphasizing the functional aspect of the city (commuting) and ability to include areas outside Prague or even the Central Bohemian Region represents an advantage.

GRAPH 3 / **ACTUAL AND POTENTIAL DEFINITION OF PRAGUE: HOW WEALTHY WOULD PRAGUE BE?**

GDP IN RELATION TO THE EU AVERAGE (100), PPS PER CAPITA



Source: ČSÚ, OECD and authors' calculations based on this data.

1.4.2 ALTERNATIVE DEFINITION OF PRAGUE AND EUROPEAN FUNDS

None of these adjustments are clearly meaningful for the purpose of allocating European cohesion policy resources. The resulting numbers would give a more realistic picture of GDP for a territory that is better defined without some administrative boundaries, but it would make all or part of the Central Bohemian Region ineligible for European subsidies without pushing the entire, newly defined area of Prague below the threshold of eligibility.

Another question is what impact a change in methodology would have on the European-wide level; this could have a major impact on a number of medium-income regions surrounding wealthier cities.

1.5 Appendix: Methodology and Data Sources

From a technical point of view, data analysis was performed reproducibly. From the raw data download to graphs production every aspect was worked on in R software. All code is available on request from IPR Prague code repository.

1.5.1 MACROECONOMIC INDICATORS

We use the following macroeconomic data:

At the NUTS2 level:

- GDP per capita in purchasing power parity (graph 1): ČSÚ, regional accounts (2017) – database of regional accounts
- GDP regions in relation to the EU28 average: ČSÚ/Eurostat for 2017 (identical data) – this is average GDP per capita across the entire EU, not the average for regions, but for individuals (total EU28 GDP divided by EU28 population)

- GDP per capita in purchasing power parity (graph 2): Eurostat, data set tgs00005 (2017 or newest available, according to region, most often 2016)
- Productivity per employee (graph 2): calculated from GDP in purchasing power parity (Eurostat, set tgs00004) and hours worked (Eurostat set nama_10r_2emhrw, category "Employed", 2017 or newest available, according to region, most often 2016)
- Disposable household income (graph 2): Eurostat set tgs00026 (2017 or newest available, according to region, most often 2016)
- Population for calculating weighted average GDP for Prague and the Central Bohemian Region: Eurostat, set demo_r_pjangroup (2017 or newest available, according to region, most often 2016)
- Population for calculating weighted average of GDP for Prague and the Prague-East and Prague-West districts: ČSÚ (2017)

At the level of functional urban areas, (FUA):

- GDP per capita in PPP USD (constant PPP, constant prices, price index base year of 2010, expenditure method) according to FUA: OECD, Metropolitan areas data set, CITIES data set (2016)
- Work productivity per employee in PPP USD analogously to GDP: OECD, CITIES data set (2016)
- To calculate the ratio to the EU28 average, we used the value of the EU28 average in PPP USD per capita (price index base 2010) from the OECD database of national accounts, 2016, expenditure method (35,392 USD, https://stats.oecd.org/index.aspx?queryid=60702, the National Accounts data set, code SNA_TABLE1)
  – here, it is also average GDP per capita, not the average for regions or countries.

1.5.1 FUNCTIONAL URBAN AREAS (OECD)

To compare economic agglomerations, we use OECD data (see above), that show estimated GDP for an area determined according to the methodology created in cooperation between the OECD and EU. Functional urban areas (FUA) are defined as the area of all municipalities where more than 15% of people commute to the center of the agglomeration. (This is a less sophisticated method than, for example, the approach used by experts at the Charles University Faculty of Science in defining metropolitan areas and agglomerations at the request of the Ministry of Regional Development (MMR) to implement integrated tools in the period after 2020). However, unlike other approaches (e.g. the hypothetical merging of Prague with surrounding districts) the OECD method is less dependent on the administrative borders of larger areas, so the functional area for Prague according to the OECD also includes several municipalities outside the Central Bohemian Region.

The methodology and its results, including a geodata set of boundaries and list of municipalities included, is available at: https://www.oecd.org/cfe/regional-policy/functionalurbanareasbycountry.htm

What Is Prague's Standing in the Czech Republic?

Prague's access to national funds

2.1 Summary of Section 2 – Conclusions and Recommendations

2.1.1 BUDGETARY ALLOCATION OF TAXES

Conclusion:

Prague receives more money per capita from budgetaryh allocation of taxes (BAT) than usual for other local governments (CZK 43,000 compared to 22,000: NB we compare the total revenue of local governments from BAT, i.e. from the regional and municipal parts of BAT); revenue per person from transfers and other revenue does not differ much. With respect to the proportion of total revenue, however, Prague is more dependent on BAT than other local governments (64% compared to 43–50%). **In relation to GDP, however, Prague receives relatively little from BAT and transfers;** BAT is redistributed from economically stronger regions to economically weaker ones.

When arguing its case in the debate on BAT and regional distribution of transfers, Prague will encounter legitimate arguments regarding the redistribution and compensatory role of BAT and state subsidies; moreover, it is difficult to defend determination of the "proper" coefficient, which is the highest for Prague out of all Czech cities and municipalities.

Recommendations:

- Prague should argue that productive public investment into Prague will lead to an increase in funds redistributed to the regions.
- In the BAT debate, good arguments exist for simplifying and clarifying the process (see inclusion of Prague in the regional BAT), or strengthening the incentive principle, for example, by linking the proportion of tax revenues to GDP or tax collection in the municipality.

2.1.2 INVESTMENT TRANSFERS FROM THE STATE

Conclusion:

Investment transfers from the state to Prague per capita are approximately six times lower than the average for other local governments. This difference is largely due to Prague being ineligible for many European subsidies.

Recommendation:

- The eligibility rules for European subsidies will not change in the coming period, therefore the discussion should center on the government's proportion in the city's investment and the targeting of state subsidies.
- Meanwhile, the use of potential European funding available should be maximized in the coming period, especially in managing the costs Prague bears as the center of a metropolitan area (Integrated Territorial Investments tool).

- As with BAT, one can argue that the entire Czech Republic will benefit, not only because residents of other regions also use Prague´s infrastructure, but also because a more productive Prague economy will generate more for BAT.
- State and European investments in regions have a partly balancing function; investment in Prague primarily functions to strengthen economic performance and should be just as important for the country.
- When negotiating with the government, Prague would be well served by thoroughly analyzing the costs and benefits (CBA) of individual investments to make it clear whether investments in Prague, despite the higher costs, bring greater benefits both in and outside the city.

2.1.3 PROPERTY TAXES, OTHER SOURCES OF REVENUE

Conclusion:

Comparison has also shown that **compared to other local governments, Prague has roughly 40% lower revenue per capita from property taxes[7]; income from property and its own activities is also relatively low considering the value of Prague real estate.**

Recommendations:

Prague should also focus on souces of revenue that do not depend on BAT and transfers from the state:

- Efforts should be made to increase the proportion of those revenues that the city can most control (property taxes, tax on property income or fees where allowed by law, or possibly consider eliminating exemptions).
- Encourage linking financial management of budgets, assets and large projects aimed at effectively using and increasing returns from assets.
- Look for budgetary cost savings by streamlining expenditures or possibly increasing coordination, including coordinating the reconstruction of infrastructure and utilities.

In interpreting these conclusions, we should keep in mind the limited data available: the analysis only works with local government budgets and does not include the regionally determined budget expenditure of central institutions.

7 / This study was written during the year 2019, therefore, it doesn't take into account the rise of income made by the increase of Prague's property tax in 2020. Since this year, the city districts have to act in the line with the new bylaw approved by the City Council on 19th September 2019.

2.2 Introduction

2.2.1 MOTIVATION AND QUESTIONS

Prague may be nominally wealthy compared to the rest of the Czech Republic, but when public expenditures are compared, the difference between Prague and other regions and municipalities is not clear. State subsidies to expand school capacity, for example, continue to be directed outside Prague, without reflecting the actual situation where Prague has disproportionate expenditure yet similar revenue to other local governments.

Specifically, the findings of this comparison help answer the questions raised by the study:

- What is the per capita public expenditure of local authorities compared to local GDP and tax revenues?
- What are the subsidies from the state budget for public expenditure in individual regions?

2.2.2 COMPARISONS: PRAGUE, MUNICIPALITIES, REGIONS

In order to understand how local government funding mechanisms treat Prague, we must compare the amount and composition of Prague's budget revenues with the revenues of other local governments. For context and better comparison, we also show the comparison per capita and in relation to the region's economy. Revenue from central sources are placed in the context of a municipality's total revenue structure.

2.2.3 HOW TO INTERPRET NUMBERS IN THIS ANALYSIS: METHODOLOGY

For a better comparison of Prague to other local governments **in other regions, we add the revenues of the region to the revenues of the municipalities in the region.**

For clarity, we also group the budget revenue of local governments into three categories:

- Revenue from proportion of budgetary allocation of taxes (BAT)
- transfers from the state budget
- other revenues, in which property taxes and other income from assets play an important role

The degree of redistribution of tax revenue would be most apparent by comparing the BAT results and a regional breakdown of tax collection. Data on regional tax collection is not publicly available, and we therefore use GDP[8] as a proxy for economic performance.

We restrict ourselves **to expenditure in local government budgets only;** no data is available for the geographic distribution of expenditure from the central government or the entire public sector.

Data sources and the methods used are described in greater detail in the appendix.

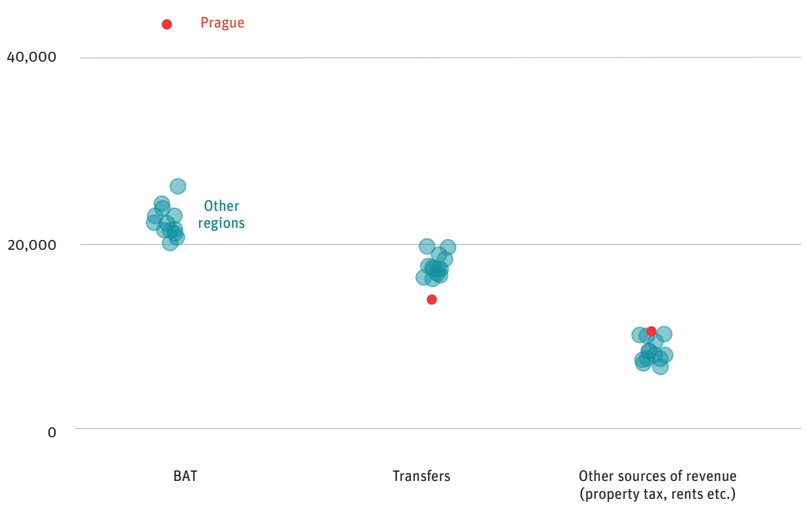
8 / Financial administration statistics track collection according to tax authorities, not taxpayer domiciles or places of business; a large portion of taxes are collected by a specialized tax authority, therefore geographic allocation is not possible.

2.3 Sources of Municipal and Regional Funding

Revenue from the proportion of BAT is primarily determined using the formula established by law and the figures for nationwide volume of taxes collected; transfers are partly due to legislation (e.g. for educational funding), partly through granting subsidies (including European funds) and the ability of local governments to obtain them. The other income category includes resources over which municipalities have more control, like management of their own property and adjustment of property taxes coefficients.

Financing from the state budget—BAT and transfers—represents about 90% of revenue for the City of Prague's budget. Prague is relatively more dependent on BAT revenue than other regions, while gaining less of its revenue from transfers and from other sources (see graph 4 below).

GRAPH 4 / **REVENUES OF LOCAL GOVERNMENTS PER CAPITA BY SOURCE, PRAGUE AND OTHERS BY REGION (2018)**



Source: authors' calculations based on data from the Treasury and Czech Statistical Office (2018).

Graph 4 expressed in Czech crowns per capita, illustrates that Prague has significantly higher revenues from BAT than the average of other Czech regions (CZK 43,000 compared to 22,000). Its revenue per capita from state transfers does not differ dramatically from other regions. But Prague´s revenue per capita from other sources is approximately 20% lower than other regions´ (CZK 6,100 compared to 7,300 per capita).

If, however, we relate revenue to economic performance measured by GDP (graph 5 below) we see that Prague revenue from the state is rather low: revenue from BAT corresponds to 4% of Prague's GDP compared to approximately 5.5% in other regions; for transfers it is 1.8% compared to 4.4%. Other revenues are also lower in relation to GDP: 0.6% in Prague compared to 1.5% in other regions. Since regional GDP can also be viewed as a proxy for tax collection, this view shows how BAT and state transfers redistribute tax revenue between local governments with varying economic performance.

GRAPH 5 / **LOCAL GOVERNMENT REVENUES BY SOURCE IN RELATION TO GDP, PRAGUE AND OTHERS BY REGION (2018)**

Source: authors' calculations based on data from the Treasury and Czech Statistical Office (2018).

The total volume of money flowing from the state to local governments (i.e. BAT and transfers) results from the budgetary allocation of taxes (BAT) and transfers that reflect, to a varying degree, the principles of compensation, redistribution and motivation.

Graph 6 below gives a more detailed comparison of individual revenues, comparing revenue per capita in Prague to other regional governments. Although Prague may clearly receive more BAT per capita, the investment transfers, property tax, and income from assets and its own activities are significantly lower. (A comparison of individual regions expressed per capita, absolutely and proportionally, is available in the Appendix).

GRAPH 6 / **REVENUES OF PRAGUE AND OTHER LOCAL GOVERNMENTS: VOLUME PER CAPITA IN CZK (2018)**

Source: authors' calculations based on data from the Treasury and Czech Statistical Office (2018).

2.4 How Budgetary Allocation of Taxes (BAT) Works and the Role It Plays

The budgetary allocation of taxes (BAT) determines how are collected taxes distributed between municipalities. In the Czech Republic, approximately 26% of shared taxes are distributed in this way, including income tax and VAT. BAT primarily follows the logic of need, i.e. compensation and partial redistribution: in calculating municipal revenue, population numbers and the number of students in schools plays an important role.

BAT also redistributes a small proportion of income tax[9] according to the number of employees in individual municipalities. This aspect of BAT is governed by the principle of compensation (public sector costs in an area grow with the number of employees) and partially by motivation (if a municipality attracts an employer, its revenue increases slightly). After the most recent reform (see detail below), however, BAT no longer includes the previously existing and purely motivational element through which a municipality received a portion of the revenue from income tax collected in its territory. (If the motivational element were slightly increased and the current 1.5% share were allocated proportionate to GDP produced in the area, it would only bring Prague an additional CZK 170 mil. per year. A more significant increase would occur only if more than the current 1.5% of income tax revenue were redistributed. But this would implicitly lead to a dilemma for BAT, namely to what extent most redistributed funds should go to employees rather than citizens. This would also mean a reduction in the weight of Prague's municipal coefficient, which is relatively high, and the overall impact on Prague's revenue could end up being negative.)

9 / 1.5% of national average of income tax revenue

Income Tax Collected in Municipalities As a Motivational Element of BAT

From 2000 to 2017, municipal income included 30% of self-employment income tax collected within their territory. But implementation of this rule took into account all persons submitting their own tax returns. Because of the complicated nature of filings, refunds and the technical approach of certain municipalities, this element caused losses (in absolute numbers) since municipalities de facto returned taxes that they never received from BAT.[10]

This element was eliminated as of 2017. Since the economy has grown in recent years, Prague did not experience a related drop in tax revenue after this change. The impact of the change is clear, however, in that Prague's proportion of personal income taxes collected nationwide was lower in 2018 than 2013, despite growth in the economy and overall income tax revenue.

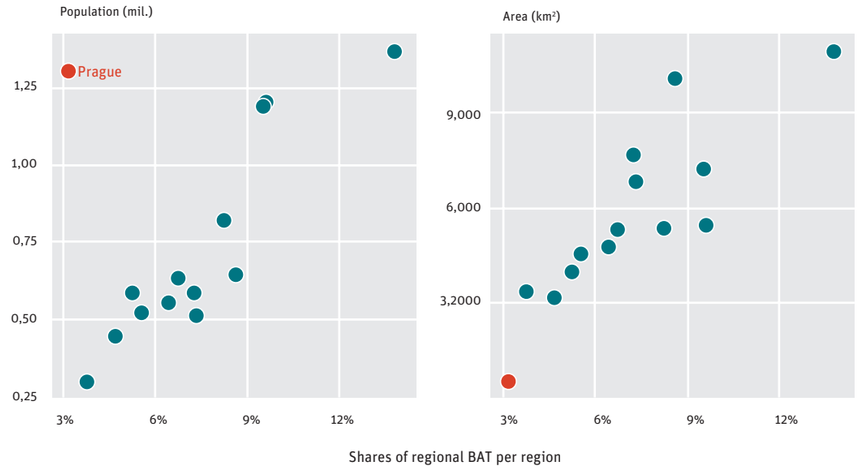
In 2019, the government rejected a bill proposing to reintroduce this element.[11]

10 / See Schneiderová, Ivana (2012). "Technical Error Hurting Municipalities: Who Actually Benefits?" Modern Municipality, available at https://www.moderniobec.cz/technicka-chyba-poskozujici-obce-komu-vlastne-prospiva/ (obtained 18.11.2019)

11 / Record no. 830/16 in the eKlep system, available at https://apps.odok.cz/veklep-detail?pid=ALBSAAVA8XH3 (obtained 18.11.2019)

The formula for determining a region's proportion of BAT behaves specifically and allocates approximately 9% of shared tax revenue to regions. (This also affects Prague, which BAT considers both a municipality and a region). The proportion allocated from shared tax revenue to individual regions is specified by law. Unlike municipal income calculations, regional BAT does not take into account demographic changes over time. Regression analysis suggests that factors related to the size of the region and number of people played an important role in determining the coefficients in2000. These same coefficientsare still applied today.

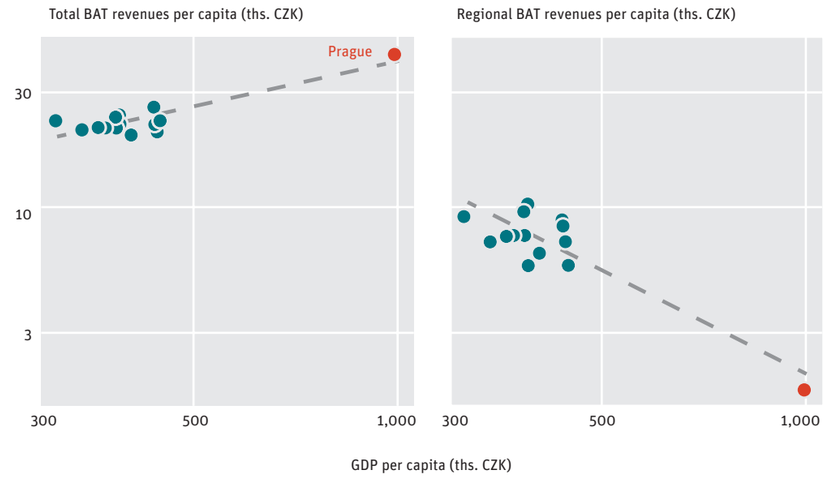
GRAPH 7 / **REGIONAL SHARES OF BAT: RELATION TO AREA AND NUMBER OF PEOPLE PER REGION / PRAGUE (2018)**



Source: authors' calculations based on data from the Treasury (2018).

BAT is largely impacted by general coefficients that take into account the higher expenditures of large cities; but it is not clear from current legislation which factors are included in these coefficients (density, service for the agglomeration, etc.), therefore it is relatively difficult to discuss whether the coefficients adequately compensate for these needs. The left part of the graph 8 below shows that BAT, to a certain degree, is proportionate to GDP per capita; this is given by higher coefficients in large cities, which typically also generate greater GDP per capita. But the graph 7 above shows that regional differences in BAT revenue only partly reflecttheir differences in GDP.

GRAPH 8 / **REGIONAL SHARES OF BAT: RELATION BETWEEN GDP AND REVENUE OF REGIONS / PRAGUE (2018)**



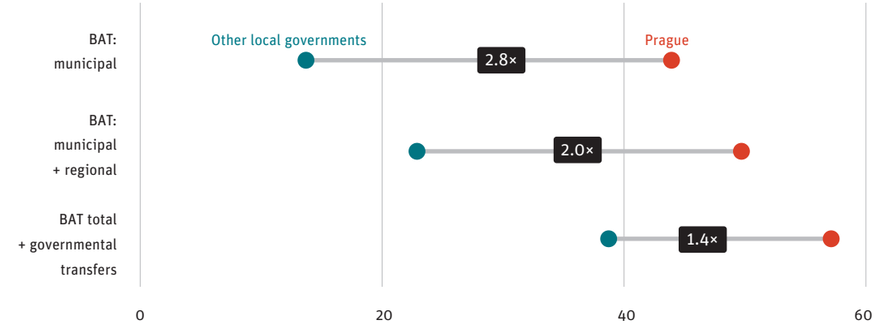
Source: authors' calculations based on data from the Treasury and Czech Statistical Office (2018).

This part of the BAT follows the logic of compensation (larger area and population = higher costs), but also redistribution (larger area = economically less productive rural areas – see the right side of graph 8 above). The resultant proportion for Prague in the regional portion of shared taxes is only 3.1% due to its area.

This disproportion may be compensated for by Prague's higher coefficient in determining municipal revenue. Including Prague in the regional BAT, however, complicates comprehension of the entire system and any discussion of proposed changes.

One takeaway from this analysis is that in calculating the regional proportion of BAT, the disparity in revenue from BAT per capita between Prague and other regions is less than when only the regional part is compared, although this general comparison dominates discussions of BAT. Due to transfers and property taxes, the disparity is even smaller in overall revenue.

GRAPH 9 / **PROPORTION OF REVENUE FOR PRAGUE AND OTHER LOCAL GOVERNMENTS PER CAPITA: INFLUENCE OF INDIVIDUAL MECHANISMS (IN THOUSANDS OF CZK)**

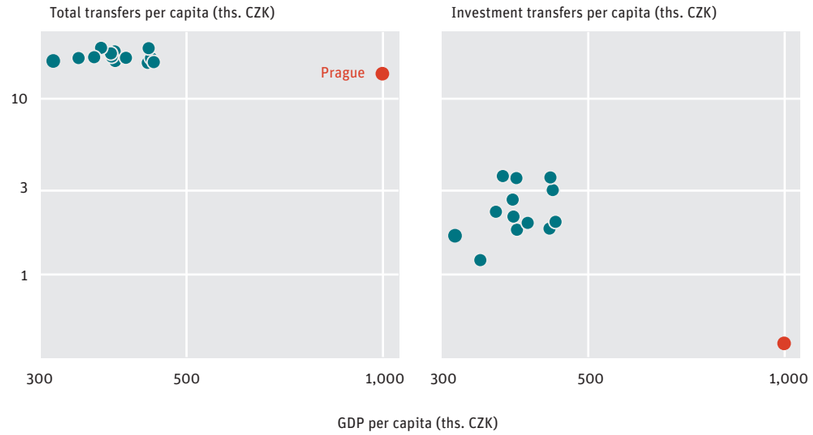


Source: authors' calculations based on data from the Treasury (2018)

2.5 Who Receives Transfers from the State Budget and Why

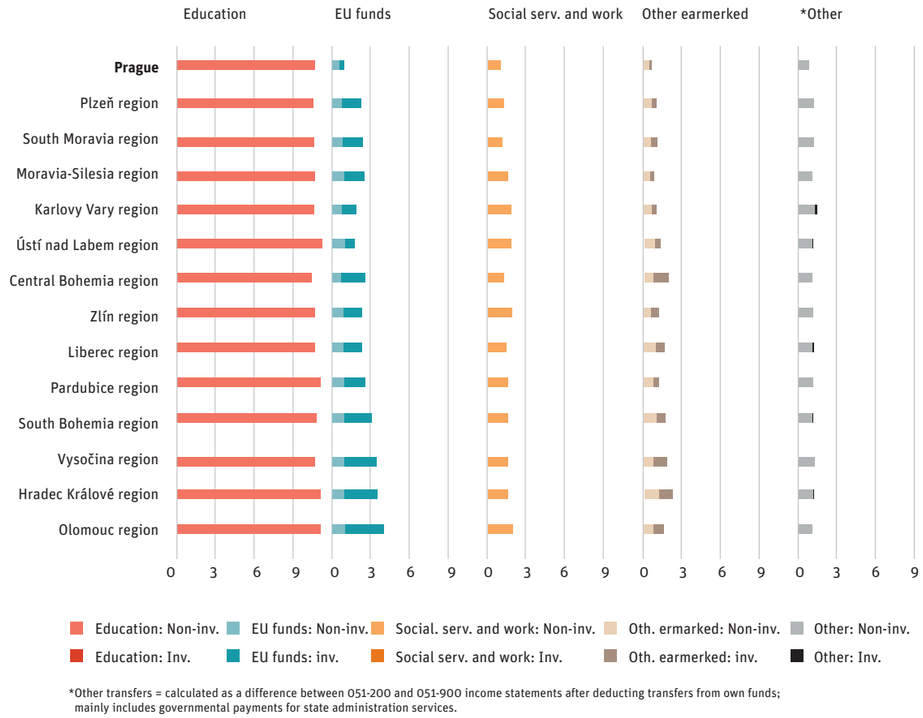
The state also provides municipalities with special-purpose and need-based funding outside BAT, specifically through investment and non-investment transfers, with non-investment transfers dominating. A large portion of non-investment funds is tied to specific public services such as education and social services. Their volume is determined by need based on, for example, the number of pupils. This is also why Prague receives a similar amount of transfers per capita to local governments in other regions.

GRAPH 10 / **RELATIONSHIP BETWEEN GDP AND TRANSFERS TO LOCAL GOVERNMENTS FROM THE STATE BUDGET, BY REGION**



Source: authors' calculations based on data from the Treasury and Czech Statistical Office (2018).

GRAPH 11 / **TRANSFERS FROM THE STATE: LOCAL GOVERNMENTS BY REGION (THOUSANDS OF CZK PER CAPITA, 2018)**



*Other transfers = calculated as a difference between 051-200 and 051-900 income statements after deducting transfers from own funds; mainly includes governmental payments for state administration services.

Source: authors' calculations based on data from the Treasury and Czech Statistical Office (2018).

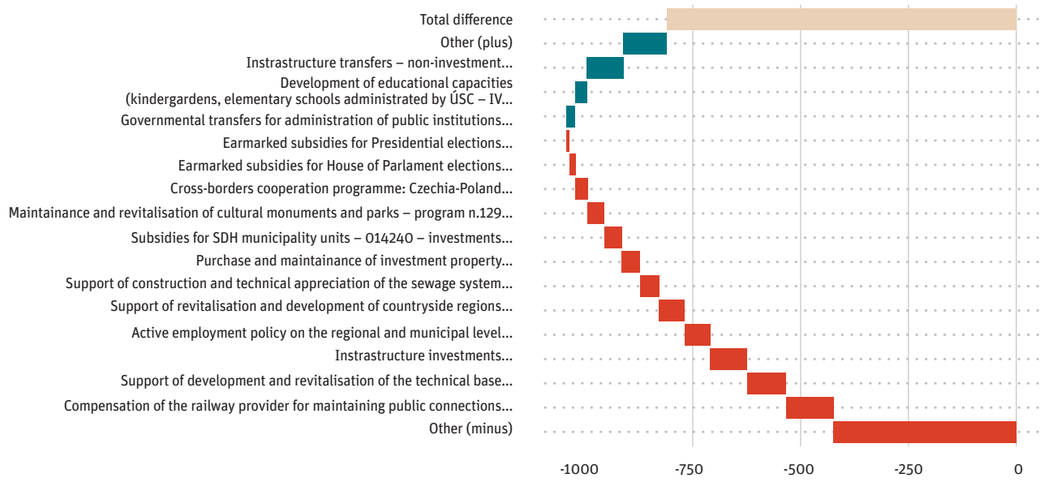
Investment funding is often special-purpose and tied to subsidy programs and specific projects that the municipality or region has requested the state to finance. Moreover, a significant portion of investment funding from the state comes from European funds[12], which Prague as a developed region is often not eligible for. The result is that Prague receives approximately 83% less investment transfers per capita than other regions[13].

Graph 12 below visualizes that individual transfers to local governments contributing most to this difference are subsidies for refurbishing schools, subsidies for public railway services and investment into transportation infrastructure. Prague, however, receives more money per capita than other local governments from subsidies to expand pre-school and elementary school capacity and subsidies for non-investment costs of transportation infrastructure.

12 / V účetnictví státu a samospráv se jeví jako transfery od státu, protože z rozpočtu EU putují příjemcům přes tzv. Národní fond spravovaný Ministerstvem financí.

13 / In state and regional accounting, this appears as transfers from the state since the funds are moved from the EU to recipients through the National Fund managed by the Ministry of Finance.

GRAPH 12 / **TRANSFERS FROM THE STATE: INFLUENCE OF INDIVIDUAL TRANSFERS ON THE DIFFERENCE IN REVENUE BETWEEN PRAGUE AND OTHER LOCAL GOVERNMENTS (THOUSANDS OF CZK PER CAPITA, 2018)**



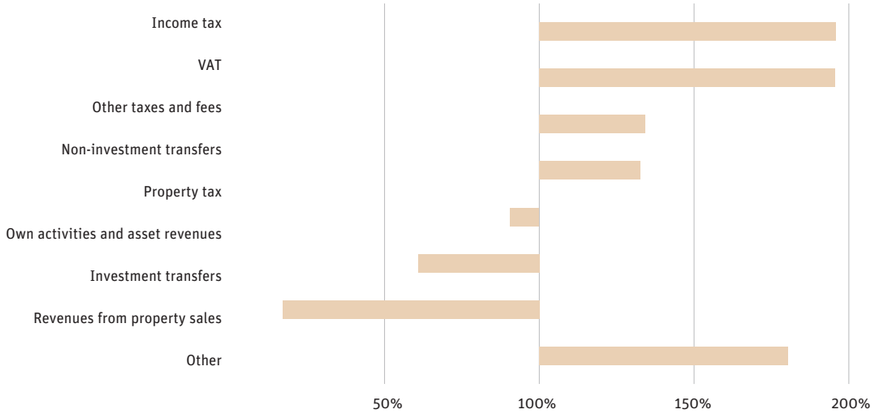
NB: This only concerns money allocated to local government budgets; for total investment in individual regions, regardless of the budget administrator, the ratio will be different: Prague sees more institutional investment in culture and universities, although it is likely that centrally managed investment in transportation infrastructure is greater in the regions. Unfortunately, this data is not available.

2.6 What Other Funding Sources Do Local Governments Have at Their Disposal?

Although this part examines local government revenue from the state budget, the data indicates other sources of revenue not affected by BAT, state transfers or subsidies need to be considered as well. Specifically, compared to other local governments, Prague has relatively low revenue from property taxes. While revenue from its own assets may be higher per capita than other local governments, considering the high value of assets in Prague and the potential of their productive use, it is likely that returns could be higher. Graph 13 below shows all the major revenue streams, directly comparing the volume per capita of Prague with the volume per capita elsewhere in the Czech Republic.

GRAPH 13 / **PRAGUE VS. OTHERS: REVENUES BY SOURCE**

100% = AVERAGE REVENUE PER CAPITA OF OTHER REGIONS



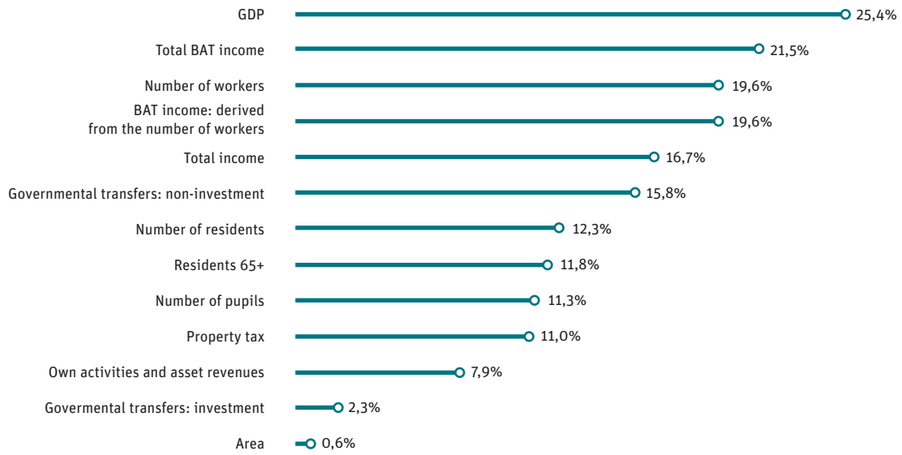
Source: authors' calculations based on data from the Treasury and Czech Statistical Office (2018).

From this comparison, however, it cannot be directly inferred what Prague's revenue stream should look like compared to other regions or whether Prague's revenue stream should be more like those of other municipalities. Asset income is heavily dependent on the volume of assets managed at a given time; analogously, property tax revenue depends on the structure of the property in a given territory. In both cases, Prague is different from other regions for structural reasons. For example, Prague residents are likely to occupy fewer square meters per person, which reduces the relative volume of property tax, etc., although they are likely to benefit more from investments in their neighborhood, which could lead them to thinking that they should be more involved in funding these investments.

The graph 14 below compares Prague's economic contribution to its proportion of other national quantities. Here, large discrepancies are clearly visible: Prague creates over a quarter of the country's GDP but collects less than 8% of property tax. Viewed through GDP, this indicates that property tax behaves regressively, at least when regions are compared, which is another reason for discussing reforms. Demographic parameters such as the number of children and pupils and residents are also notable; the first parameter is included in BAT calculations, while inclusion of the second is under discussion. Including or increasing the weight of these parameters would reduce Prague's share of BAT, since it would decrease the impact of its general coefficient.

GRAPH 14 / **PRAGUE'S LOT: PRAGUE'S SHARES IN SELECT QUANTITIES AND FINANCIAL AGGREGATES**

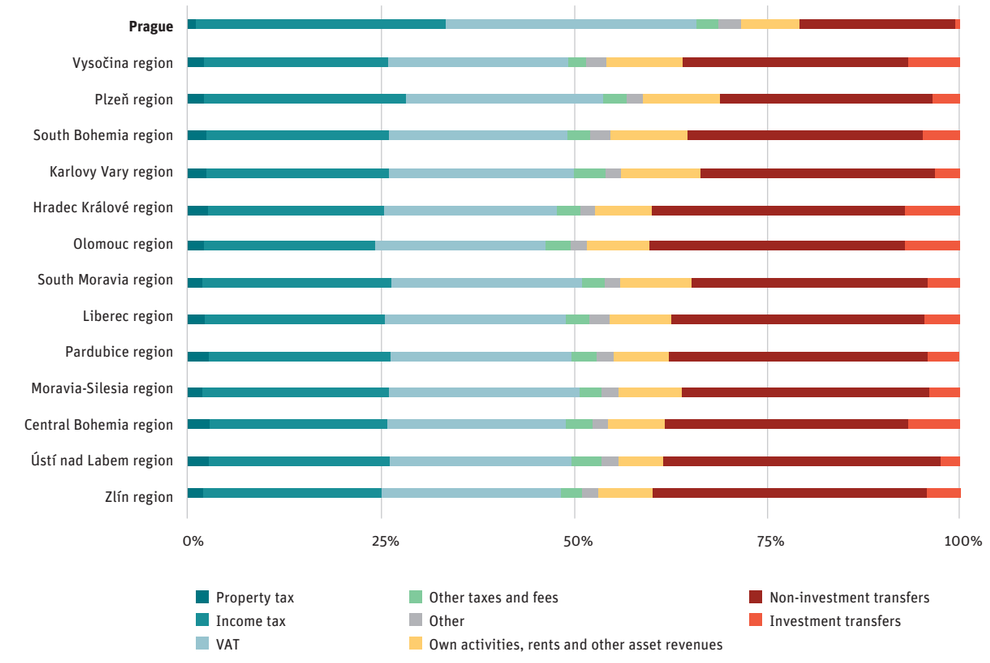
100% = ALL LOCAL GOVERNMENTS IN THE CZECH REPUBLIC (FOR FINANCIAL INDICATORS SUM OF MUNICIPAL AND REGIONAL VALUES)



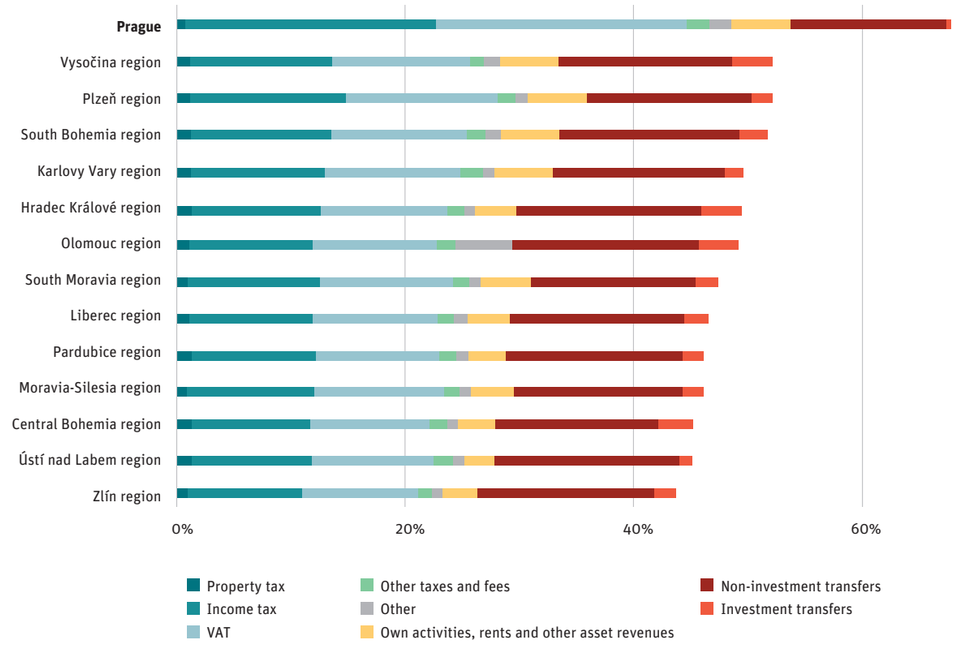
Source: authors' calculations based on data from the Treasury, Ministry of Finance and Czech Statistical Office (2018).

2.7 Appendix: Detailed Comparison of Revenue Streams for Local Governments

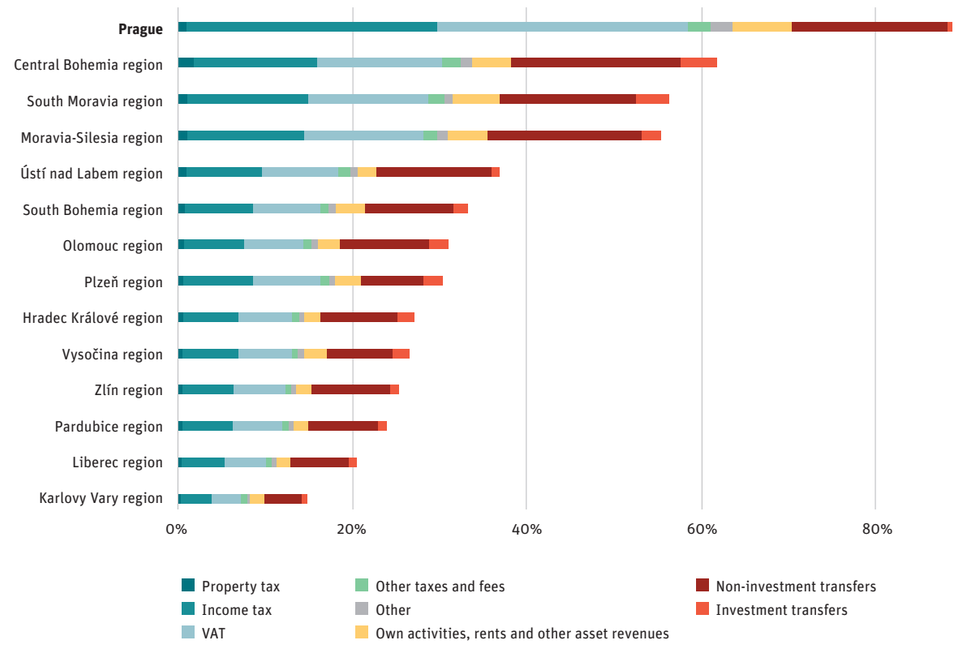
GRAPH 15 / **REVENUES FOR PRAGUE AND OTHER LOCAL GOVERNMENTS: PROPORTION OF INDIVIDUAL SOURCES, BY REGION (2018)**



GRAPH 16 / **REVENUES FOR PRAGUE AND OTHER LOCAL GOVERNMENTS: VOLUME PER CAPITA IN CZK, BY REGION (2018)**



GRAPH 17 / **REVENUES FOR PRAGUE AND OTHER LOCAL GOVERNMENTS: VOLUME IN CZK, BY REGION (2018)**



2.8 Methodology and Data Sources

Analysis is based on the following data sources:

- data from the Treasury of the Ministry of Finance of the Czech Republic on the budgets of territorial organizations, statement 051, and parts of 0100, 0200 and 0700 for 2018, see https://monitor.statnipokladna.cz/
- data from the Financial Report on gross revenue from shared taxes for 2018: https://www.financnisprava.cz/cs/dane/kraje-a-obce/danove-prijmy-kraju-a-obci/prubeh-celostatniho-inkasa-sdilenych-dani-3735
- appendix of Decree 192/2018 Coll., on budgetary allocation of taxes (area, number of pupils, proportion of tax revenue, etc.): https://www.mfcr.cz/cs/legislativa/legislativni-dokumenty/2019/vyhlaska-c-219-2019-sb-36077
- GDP of regions in Czech Statistical Office's regional accounts (2017): http://apl.czso.cz/pll/rocenka/rocenka.indexnu_reg and https://www.czso.cz/csu/czso/regionalni-ucty-za-regiony-soudrznosti-a-kraje
- CSO data on the population of municipalities and regions (2018)
    - Population by five-year age groups and gender in regions and municipalities: to calculate the percentage of population 65+, https://www.czso.cz/csu/czso/obyvatelstvo-podle-petiletych-vekovych-skupin-a-pohlavi-v-krajich-a-okresech
    - Population as of 31 December according to gender in municipalities, https://www.czso.cz/csu/czso/obyvatelstvo-k-3112-podle-pohlavi-v-obcich

For Treasury data, the following adjustments were made for comparability:

- A category was created for "own activity, revenue from assets and their sale", which, in addition to the given type items, contains item 4131 "Transfers from own funds for economic (entrepreneurial) activity", which is commonly included in transfers in budgets.
- This adjustment was made because, according to its statute, Prague lists income from property rental and sales under economic activity (as indicated in the financial statements); the majority of income from these sources is not visible in budget accounts and appears as transfers from the economic activity account. To compare Prague with other local governments, this transfer was reclassified, and other similar sources of revenue were added.

From a technical point of view, data analysis was performed reproducibly. From the raw data download to graphs production every aspect was worked on in R software. All code is available on request from IPR Prague code repository.

Cities and Funding for Strategic Transportation Infrastructure – an International Comparison

3.1 Summary of Section 3 – Conclusions

3.1.1 LOCAL GOVERNMENTS' PUBLIC FINANCE STRUCTURES

- With respect to public revenue allocation, federal states are the most decentralized, along with quasi-federal Spain and the Nordic countries.
- A combination of tax revenue and transfers makes up roughly 85% of local government revenue in all studied countries.
- The ratio between tax revenue and transfers depends heavily on the degree of decentralization of income tax revenue.
- A higher level of GDP per capita is typically associated with a higher proportion of revenue from local taxes and higher revenue from fees.
- The total revenue of local authorities reflects the level of delegated administrative competences.
- The division of capital expenditure between the central government and local governments in most countries (except Denmark and France) corresponds to the division of total revenue and expenditure.

3.1.2 HOW DO LOCAL PUBLIC FINANCE SYSTEMS WORK?

- Redistribution of public revenue via transfers typically takes into account needs (costs) and population.
- Some countries (e.g. France, Nordic countries, Switzerland) have more transfers targeting specific objectives, while other countries have a single dominant redistribution mechanism (e.g. Austria).
- In some countries (e.g. Spain and Croatia), large cities are favored by earmarking a larger proportion of shared tax revenue.
- The most common form of tax autonomy for local governments is the ability to collect property tax.
- Another example of fiscalautonomy is additional local income tax (e.g. Nordic countries, Netherlands, Italy) and local business taxes (e.g. Germany, Hungary, Spain).
- Three factors are fundamental for the relationship between economic growth and municipal revenue: (i) the manner of allocating tax revenues, (ii) property tax structure, and (iii) balancing mechanisms.

3.1.3 CITIES, COUNTRIES AND INVESTMENT (SINCE 1990)

- Funding strategic transportation infrastructure differs according to country (and sometimes according to projects within a single country).
- Funding transportation infrastructure construction is (1) dependent on the structure of tax revenue redistribution and the tax autonomy of municipalities and regions in individual countries, and (2) reflects, to a degree, a certain "tradition" of how these types of construction are funded.
- In new EU member states (Romania, Poland, Hungary), EU funds have played a significant role. They often replace state investment. This is also true for Czech cities, but for Prague to a lesser degree.
- The state contributes to fund subway systems in all the cities/areas examined (except Warsaw, where EU funds play a significant role, and Prague). The cities surveyed are generally more financially involved in building new subway sections (30% on average) than new roads/highways.

3.2 Introduction – Comparison of the Fiscal Systems of Selected Countries

3.2.1 MOTIVATION AND QUESTIONS

This document summarizes the findings from a comparison of local public finance systems of selected European countries and the USA. The findings are relevant with respect to Prague's public finance. Specific findings from this comparison will help to answer the questions raised by the study:

- What portion of total public revenue is allocated directly to the national budgetand to municipalities, and what portion is redistributed to municipalities from the national level?
- What are the main financial sources of municipalities (e.g. budgetary allocation of taxes, subsidies and transfers for specific projects, municipal taxes and fees, etc.)?
- What is the basis for redistribution of public revenue (e.g. size of the population, economic performance, specified needs, etc.)? Is allocation equal, progressive, or regressive?
- How strong is the relationship between a city's economic growth and available financial resources?
- What is the level of a city's tax autonomy and its ability to set taxes and fees or introduce new ones?
- What role do state contributions play in public investment projects?

The aim is to describe a variety of public finance systems existing in the compared countries, highlight possible patterns across these countries[14], and place the Czech system of public finance for local governments in this context.

14 / Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Croatia, Italy, Lithuania, Latvia, Hungary, Germany, Netherlands, Poland, Portugal, Austria, Romania, Slovakia, United States of America, Serbia, Spain, Sweden, Switzerland.

3.2.2 SCOPE AND RELATION TO OTHER FINDINGS OF THIS WORK ON THIS TOPIC

All information in the first part of this section concerns the national level and illustrates the fiscal rules for the individual cities we compare in various aspects (and cards). Whenever specific national characteristics could be used to infer the specific impact of a fiscal system on large cities or capitals, these characteristics are included as well.

We examine the public finance systems of capitals or other major cities and how infrastructure projects in the countries selected for this comparison are funded. Besides, the analysis also includes other relevant European countries where funding systems of specific cities and projects could not be examined due to the missing detailed data and information..

A more comprehensive and detailed description of the fiscal systems of individual countries is given in the enclosed overview city cards, where the described information follows profiles of cities published by the OECD/UCLG[15]. For cities where we could obtain relevant data for, the cards also describe and visualize the revenue and expenditure structure of the city finance and the system of funding for its major infrastructure projects.

15 / 2019 Edition of the World Observatory of Subnational Finance and Investment http://www.sng-wofi.org

3.2.3 SOURCES OF DATA AND INFORMATION

The comparative analysis and information on national fiscal systems described in the city cards relies heavily on data collected in the OECD and UCLG project titled “World Observatory on Subnational Government Finance and Investment[16].” This project made available the comparative data on the structure of municipal incomes and expenditures in most of the world’s countries, along with descriptive profiles of municipal public finance. The data available in this report is primarily from 2016. For more detailed questions or for countries where a system reform was planned in 2016, we have supplemented information with our own research using available online resources.

16 / 2019 Edition of the World Observatory of Subnational Finance and Investment http://www.sng-wofi.org, http://www.uclg-localfinance.org/observatory, data http://www.oecd.org/cfe/regional-policy/Observatory-on-Subnational-Government-Finance-and-Investment.htm

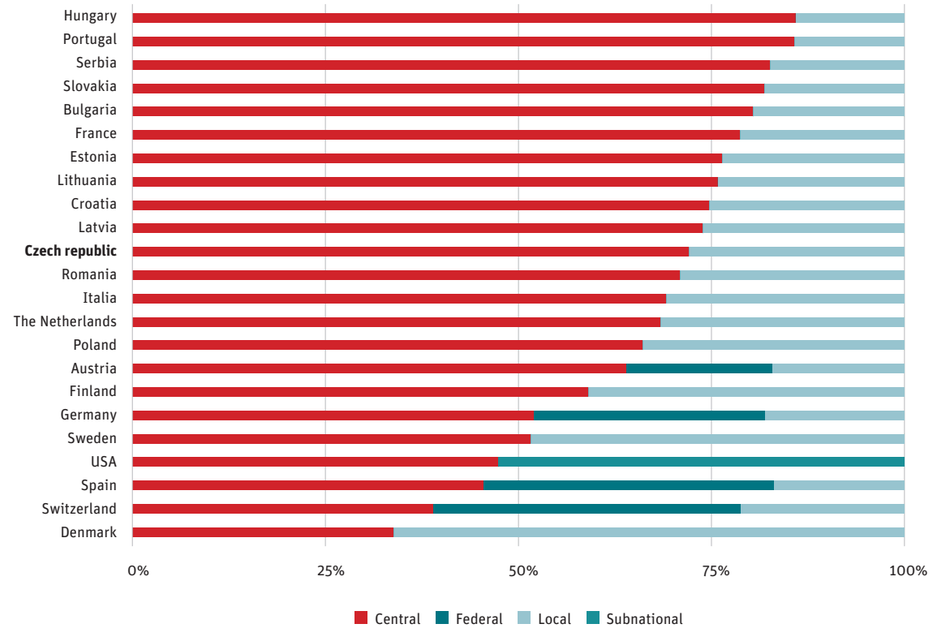
3.3 Local Governments’ Public Finance Structure

In this section, we primarily answer questions 1 and 2: based on OECD/UCLG data, we describe the composition of local governments’ revenues and expenditures, and the role of municipal public finance in the fiscal systems of the countries surveyed.

3.3.1 ALLOCATION OF PUBLIC REVENUE

In the countries surveyed, the differences in allocating public revenue at different levels of governance (central, federal state and local) are significant. The central government in Denmark, for example, is responsible for only around 30% of public revenue, while in Hungary it is more than 80%. Nonetheless, countries exhibit a relatively continuous spectrum in terms of income distribution between levels of government without significant extremes or steps.

GRAPH 18 / **PUBLIC REVENUE ACCORDING TO LEVEL OF GOVERNMENT**

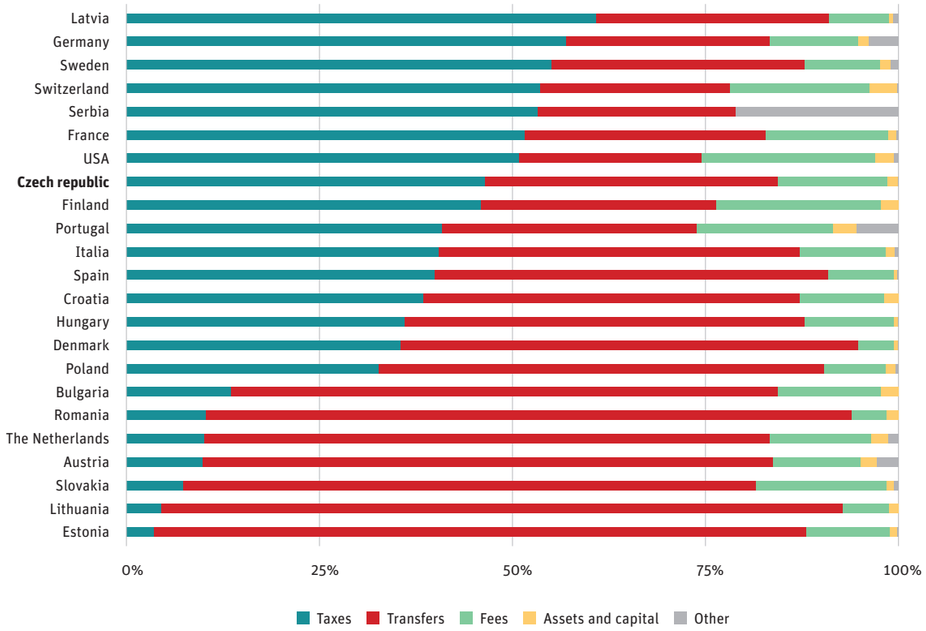


Federal states, quasi-federal Spain and Nordic countries (e.g. Denmark, Sweden, Finland) are countries where central government constitutes the lowest proportion of total public revenue. The remaining states do not exhibit any clear trend based on geographical location or historical experience.

3.3.2 COMPOSITION OF LOCAL GOVERNMENTS' REVENUES

In accordance with the OECD, we have broken down the revenue of local governments into five categories in our analysis: tax revenue, revenue from transfers, revenue from tariffs and fees, capital and asset income, and other revenue. In all countries surveyed, a combination of tax revenue and transfers accounted for the greatest proportion (approx. 85%) of local governments revenue. It is precisely the ratio of two categories that constitutes the main difference in local governments revenue systems in listed countries.

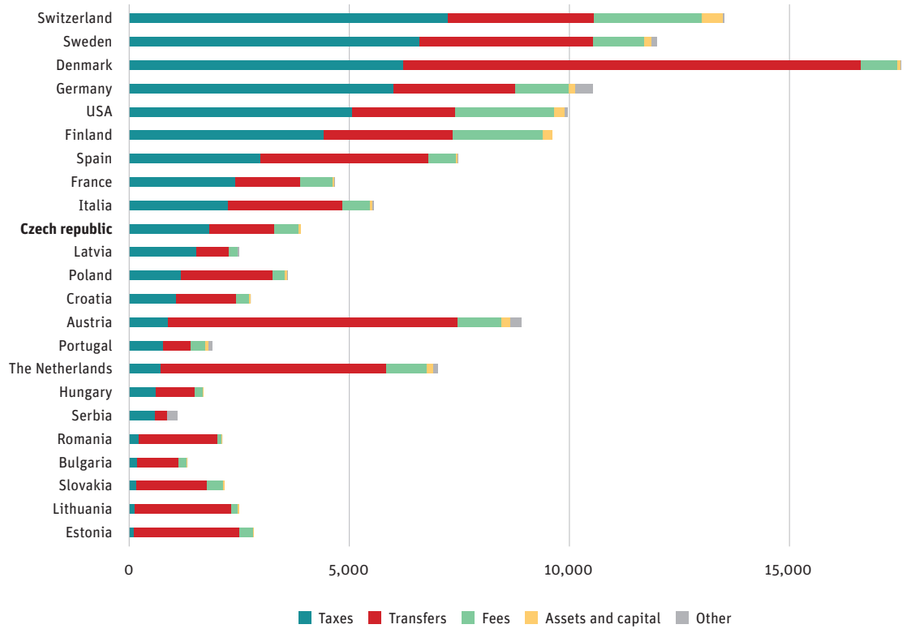
GRAPH 19 / **LOCAL GOVERNMENT REVENUE SOURCES**



Revenue structure can be taken relatively according to the sub-category ratios (Graph 19) or the absolute values of income from sub-categories per capita (Graph 20).

Comparing the relative structure of revenue reveals a significant group of countries with a very low proportion of tax revenues and a high proportion of transfers (Estonia, Lithuania, Slovakia, Austria, Netherlands, Romania and Bulgaria). These countries redistribute revenues from personal income tax via transfers (the question here is whether the Czech Republic, with its system of budgetary allocation of taxes (BAT), should also be included in this group).

GRAPH 20 / **LOCAL GOVERNMENT REVENUE PER CAPITA BY SOURCE, (PPP USD)**

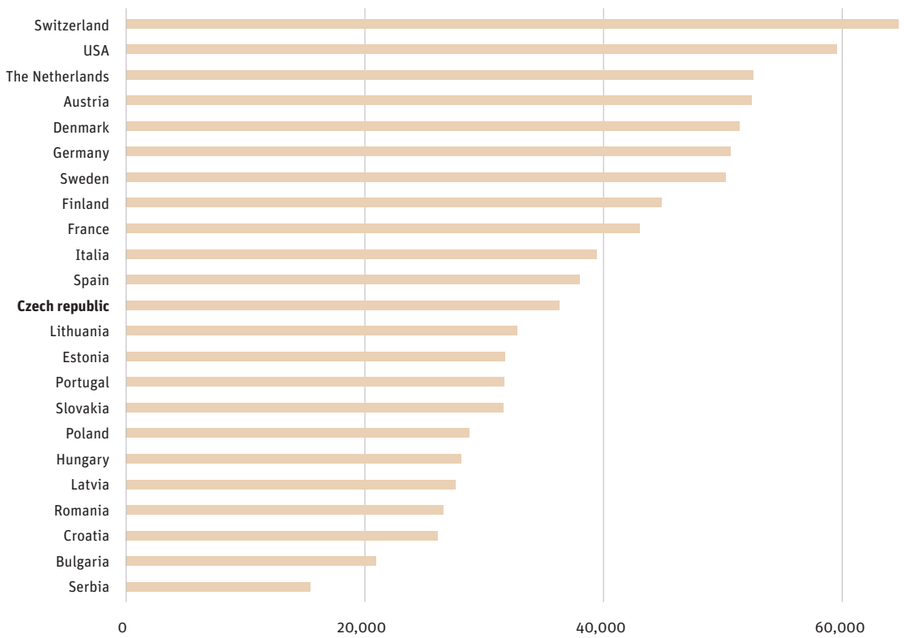


Taking absolute revenue values into account, Graphs 21, 22 and 23 clearly visualize other significant factors, such as decentralization and scope of public sector authority at the local government level. Latvia, Serbia and France, for example, appear to be similar to federal and Nordic states in terms of relative comparison of revenue structure; however, it is clear from absolute values that per capita revenue is significantly lower in these three states and reflects the different division of responsibilities between central and local government.

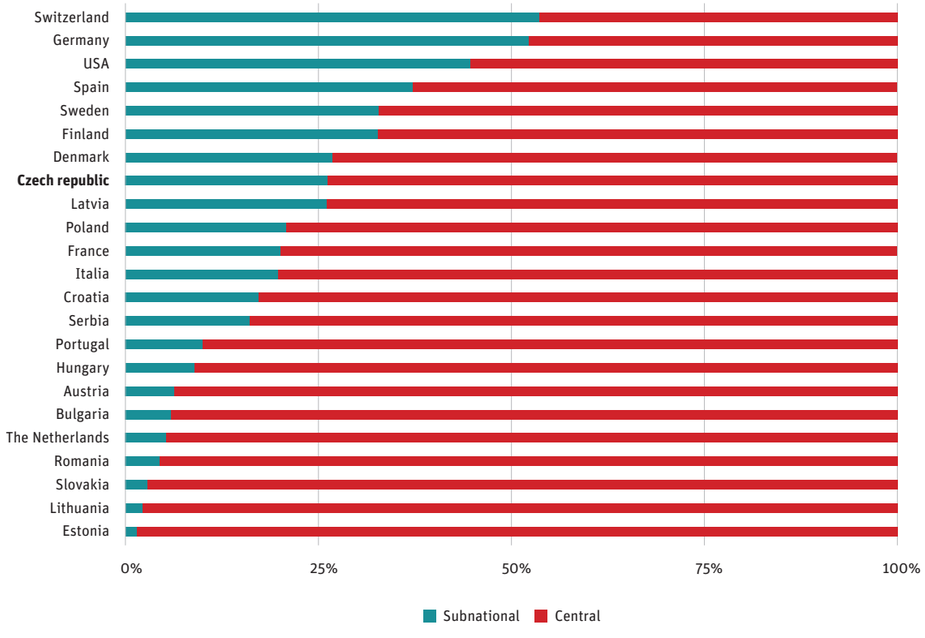
Aside from a few exceptions (Austria and Netherlands, especially), the prevailing trend is that local governments with the highest revenue per capita have a high proportion of local tax revenues. A specific case in terms of per capita revenue is Denmark, where – compared to other countries – both tax and transfer revenues are high.

The proportion of local taxes in total volume of tax collected is again highest in federal and Nordic countries. A higher proportion of local taxes in total tax revenue is also generally associated with higher GDP per capita (Austria and Netherlands are again exceptions). Besides, local governments in countries with higher GDP per capita typically collect relatively more revenue from fees.

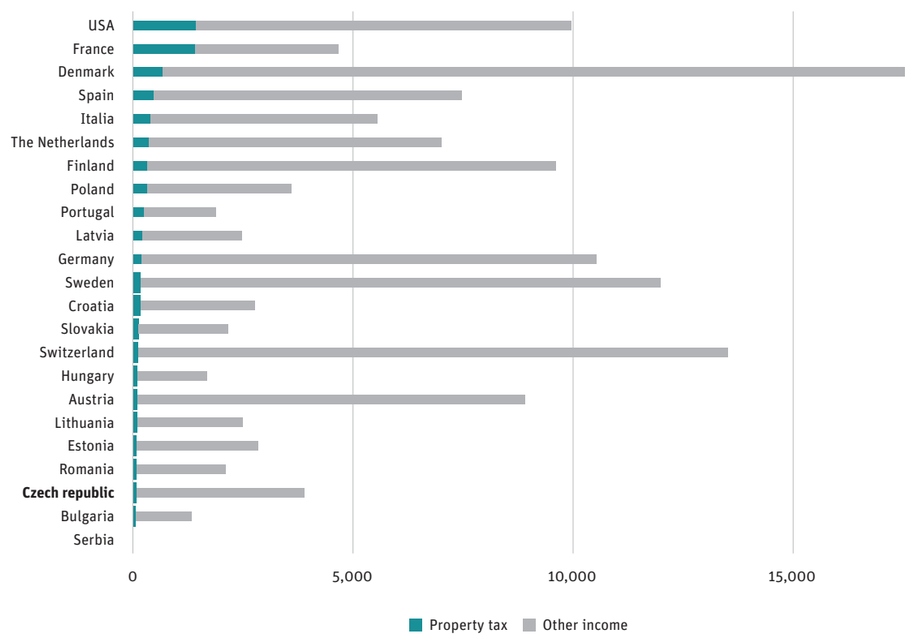
GRAPH 21 / **GDP PER CAPITA (PPP USD)**



GRAPH 22 / **TAX REVENUE ACCORDING TO LEVEL OF GOVERNMENT**



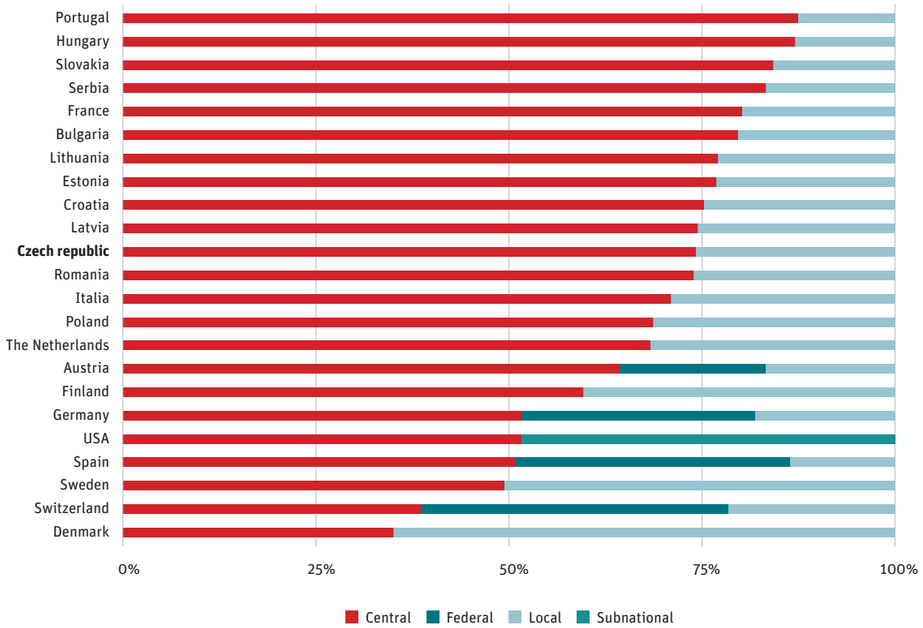
GRAPH 23 / **PROPERTY TAXES AS A COMPONENT OF LOCAL GOVERNMENT REVENUE, PER CAPITA (PPP USD)**



Local governments in all countries collect property tax. Revenue collected from property tax and its proportion in total tax revenue differs considerably in the countries surveyed. However, this revenue and proportion cannot be easily explained based on geography or systemic similarity between countries.

3.3.3 BREAKDOWN OF PUBLIC EXPENDITURE

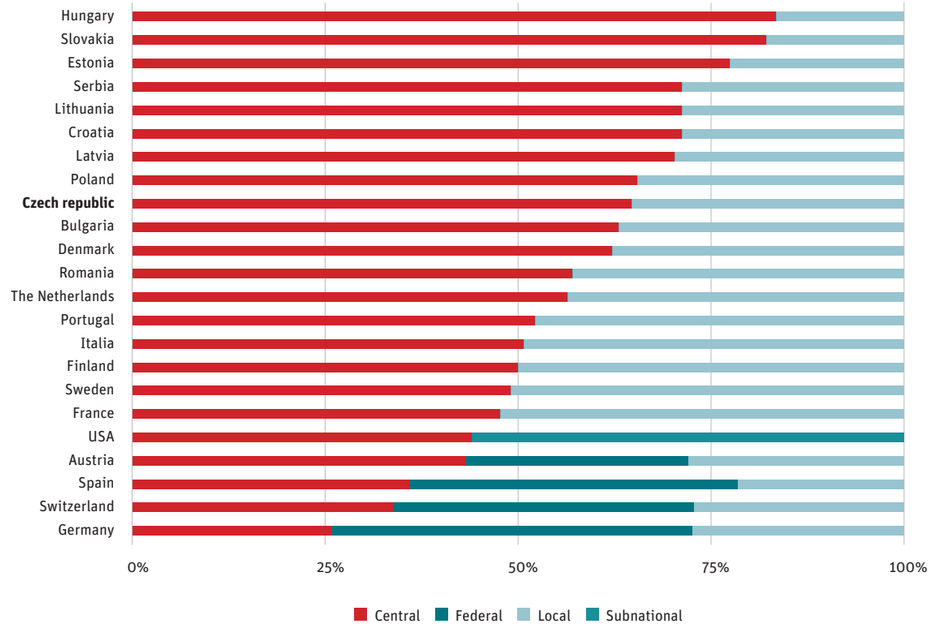
GRAPH 24 / **PUBLIC REVENUE ACCORDING TO LEVEL OF GOVERNMENT**



The distribution of public expenditure to individual levels of government in most countries corresponds to the distribution of public revenue (decentralized in federal states, Nordic countries and Spain). However, a difference in the overall balance can be observed in some countries (USA, Spain), where total public revenue is lower than total public expenditure.

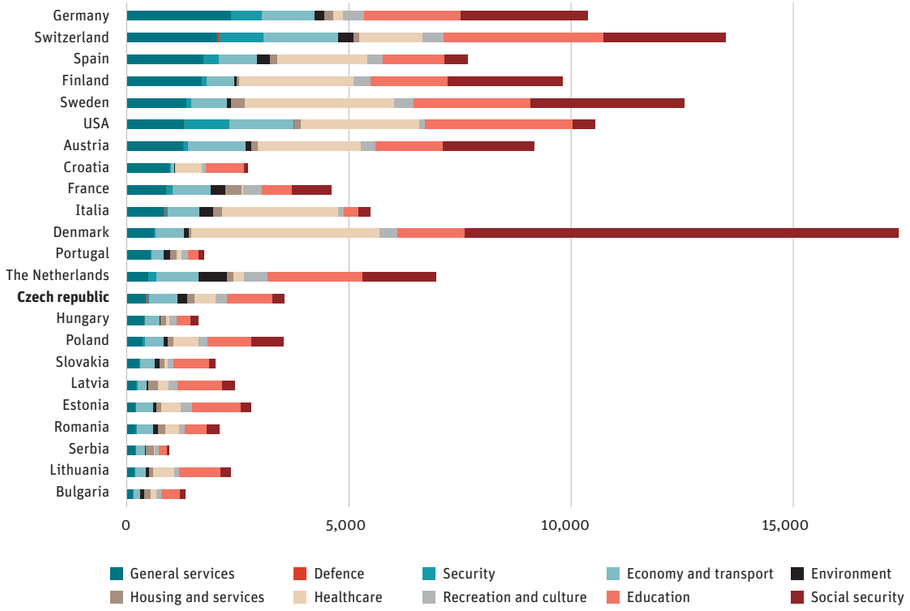
A similar division between administrative levels is evident with respect to the distribution of capital expenditure. Again, this is a continuous spectrum, where the most decentralized capital investments are performed by federal and quasi-federal countries such as Spain, Finland and Sweden. The distribution of total and capital expenditures is significantly different in France and Denmark. France is highly decentralized in terms of capital expenditure compared to overall expenditure. By contrast, Denmark's capital expenditure is significantly more centralized than total expenditure (Denmark is the most decentralized of all the countries surveyed).

GRAPH 25 / **CAPITAL EXPENDITURE BY LEVEL OF GOVERNMENT**

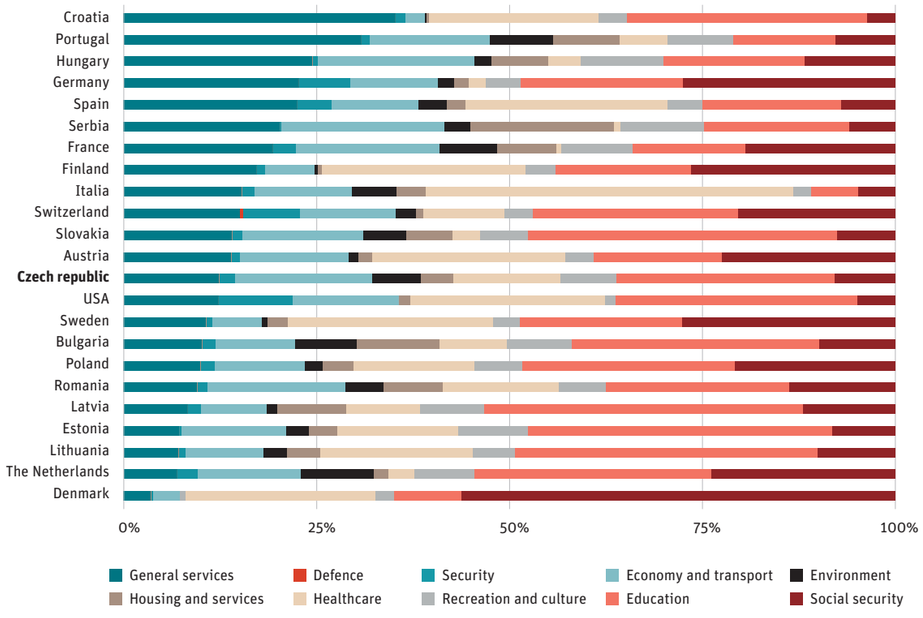


The functional classification of local government expenditure reflects the respective areas and responsible authorities. The greatest differences are visible in health care, education, social security and general municipal services.

GRAPH 26 / **LOCAL GOVERNMENT EXPENDITURE BY FUNCTION, PER CAPITA (USD PPP)**



GRAPH 27 / **LOCAL GOVERNMENT EXPENDITURES BY FUNCTION**



3.4 How Do Local Public Finance Systems Work?

This section primarily addresses questions 3 to 6 by explaining the rules that govern local public finance. We look for patterns and regularities seen across countries that demonstrate a range of possible methods for local government public finance and compare those with the Czech system.

3.4.1 GENERAL TRENDS

- In the context of this analysis, there are two basic parameters in local public finance systems: the ability of municipalities to affect the amount of taxes collected from their territory and the relationship between locally collected taxes and subsequent municipal revenue[17]. The Czech Republic is clearly at one end of the spectrum in both respects: Czech municipalities have very little authority in establishing tax rates, and their tax revenue only minimally reflects the state of the local economy. Considering the low degree of tax autonomy, the Czech system is primarily redistributive. Nearly all systems more or less clumsily balance between motivational incentives (so that municipalities are interested in growing local economies and can compete through tax rates and services provided) and the need to ensure that all municipalities provide an adequate standard of services.
- Even countries with similar institutions and historical experience have often different systems nowadays. The Baltic states are one example as Latvia differs significantly from Estonia and Lithuania in terms of municipal tax autonomy and other parameters (of all the countries surveyed, local taxes in Latvia make up the greatest proportion of local government revenue at 61%. Estonia and Lithuania, on the other hand, have the lowest proportion of taxes contributing to municipal revenue at just 3.5% and 4.5%, respectively). Similarly, Austria differs from Germany: the Austrian system mostly collects taxes centrally and allocates them to lower levels based on a formula, while even the rate of the only important local tax is established centrally. Germany, however, gives municipalities significant freedom in establishing the major local business tax rates (Gewerbesteuer). The Czech and Slovak Republics are similar in many ways. Yet, for Slovak municipalities, property tax is a much more significant source of revenue than for Czech municipalities. Moreover, Slovak municipalities have a much broader palette of local taxes at their disposal.
- Fiscal (de)centralization is the subject of lively debate and reform efforts; an example is France, where since the turn of the millennium, ongoing fiscal reforms have been tied to reforms of territorial administration (parallel transfer of competencies and revenue from the state to local governments), or Austria, where reform of the federal system should increase fiscal autonomy of municipalities. In this sense, the Czech system is rather conservative: changes are incremental and slow, directed more at adjusting parameters than changing the method, and no proposals of radical change are on the table.

17 / In countries where municipalities can significantly influence the amount of local taxes collected, a large portion of these taxes typically remain with the municipality.

3.4.2 REDISTRIBUTION OF REVENUE

Systems for redistributing revenue between municipalities nearly always follow several principles: typically, they take into account population and needs (costs). In countries where municipalities are more dependent on local tax bases, the balancing mechanisms then also partially compensate for differences in tax revenue (Sweden, Finland, Denmark and France).

Systems for balancing transfers differ in several ways.

One difference is how the balancing mechanism is structured. Many states have several types of transfers that often follow different objectives and principles (France, Nordic countries, Switzerland). Other countries, like the Czech Republic, have a single dominant transfer mechanism where the calculation depends on an aggregate coefficient (Austria is similar). These coefficients tend to be the subject of political agreement. Conversely, more structured transfers are more often based on data and reflect costs and needs of different territories. The results then differ in the clarity of the system and ability to trace the logic of individual transfers (for example, in the Nordic countries, the contributions of rich cities are calculated in the transfer system). More accurate calculation of individual transfers also enables more flexible responses to potential changes.

Countries also differ in how the rules for transfers are created and how often they are updated. Like the Czech Republic, many countries labour under a politically negotiated legislative framework (Austria, Italy, Poland and Slovakia). Elsewhere, there are political agreements between municipalities and the state (Italy, Estonia). An example of the most structured process is Finland, where an expert commission monitors the evolving cost structure of public services provided by municipalities, and transfer amounts are reviewed annually.

The devil of transfer mechanisms is in the details, which – without a thorough study – are unknown even to experts in the given country. It is therefore difficult to infer any specific recommendations based on a comparison between a larger number of countries. The fact is, however, that the Czech BAT is one of the more rigid transfer systems. It is determined more by politics and less by data, and is among the less transparent systems.

3.4.3 POSITION OF LARGE CITIES IN THE PUBLIC FINANCE SYSTEM

Among the surveyed countries, there are interesting cases of rules that take into account the special role of large cities. A straightforward example is Vienna, which has a special allocation since it is both a city and a federal state (this is similar to Prague, which is also a region; similarly as Berlin and Hamburg standing as federal states).

Vienna's Public Finance System and Cooperation in the Metropolitan Region

In many ways, Vienna is similar to Prague in its public finance system: it stands as a federal state within a relatively centralized tax system (similar to Prague as a region), while the functional urban area of the city is drawn out of the city's borders (Lower Austria, similarly as Central Bohemia Region for Prague.) As with the Czech Republic, Vienna's revenue is predominantly determined by a law similar to BAT (Finanzausgleich), according to which Vienna receives revenue separately as a municipality and as a federal state.

However, Vienna differs from Prague in that the metropolitan region has a special mechanism for sharing responsibility and financial resources between Vienna and Lower Austria when problems shared by the city and the surrounding area (Stadt-Umland Management Wien-Niederösterreich) are addressed. This has a dedicated management structure, with a council composed of politicians and officials representing the City of Vienna, Lower Austria, cities neighboring Vienna, and Vienna's city districts. This cooperation practice is financed by Vienna City Hall and the Lower Austrian Regional Council The cooperative mechanism is primarily focused on transportation, regional development, land use planning and the environment. Besides, it secondarily focuses on developing information technology for territorial administration.

In Vienna, the national government plays a more significant role in funding large infrastructure projects than in Prague. In addition to the city's ring road, it covers half the construction costs of new subway lines (see the Vienna card and the section below concerning the findings from the comparison of construction funding for strategic transportation projects in selected cities).

Croatia is a special case as well. Its legislation provides greater tax autonomy (in the form of additional local incomes) for large cities, which, considering the higher average incomes of large cities populations, de facto makes income tax more progressive. Besides, Zagreb also receives a higher proportion of personal income tax.

Unlike smaller municipalities, cities in Spain with a population bigger than 75,000 receive a portion of shared taxes. Similarly as Prague, Barcelona and Madrid have their own municipal laws. Among other things, these give them greater tax autonomy.

Czech BAT does not award large cities with greater tax autonomy or with sharing of other types of taxes not allocated to other municipalities, but it does give the four largest cities their own coefficients. Prague is also treated uniquely in its dual role as a city and a region.

3.4.4 TAX AUTONOMY

Among the countries surveyed, fiscal autonomy assumes three common forms and one special form.

The first common form is the authority to establish property taxes; here, it is difficult to compare details from the available information, but it is clear that:

- (a) the overwhelming majority of countries allocate property taxes to municipalities,
- (b) a wide range of parameters exist in typically complicated property tax systems, and these determine the actual degree of tax autonomy of the municipality.

The second form is local personal income tax surcharges, which exists in all Nordic countries surveyed, Netherlands and Italy (Austrian municipalities collect this additional tax and revenue from it but they cannot determine the rate or base of the tax).

The final, large group consistsof countries that enable municipalities to establish local business taxes: Germany, Hungary and Spain. The USA takes a specific approach by allowing states and cities to establish and collect sales tax, i.e. similar to VAT.

There is a variety of different types of fees: municipalities in all countries collect a combination of fees using different mechanisms for establishing their limits or even waiving certain fees or taxes. However, the available data does not indicate any general trend or groups of countries.

It is obvious from the available data, at least in the case of taxes, that the Czech Republic is a specific example. The property tax being the only tax a municipality can levy for which the municipality can also set the amount (albeit in a complicated and limited manner) and receive all revenue (although determining the tax base is problematic). Moreover, property tax is relatively low: even in Slovakia, where it constitutes a large part of municipal tax autonomy, its proportion of GDP is double compared to the Czech Republic[18]. In the Czech Republic, Prague collects significantly less property tax, both in absolute terms and per capita (see Section 2 “Prague’s access to national funds”). The second tax where municipalities keep a portion at least partially proportionate to the amount they collect locally is payroll tax. But municipalities do not set its rate and keep only a negligible percentage (1.5%) of the amount collected. Besides, the amount is only calculated based on the number of employees in the municipality and not on actual tax paid.

18 /
Složitější je situace u zbývající místně vybírané daně, daně z hazardu.

3.4.5 RELATIONSHIP BETWEEN MUNICIPAL ECONOMIES AND REVENUES

Three factors are at play here:

- Method for allocation of tax revenues to municipal budgets
- Property tax structure
- Balancing mechanisms

First, countries differ whether they allocate a proportion of total income to municipalities, as is almost exclusively done by the Czech BAT, or whether they take into account the amount of taxes collected in the municipality. In the first case, the system is based on population or need. In the latter case, some of the tax (albeit shared) becomes municipal revenue. Municipal tax revenues then depend on various economic indicators of economic development, such as employee, entrepreneurs and company income tax or sales tax on company sales. In any case, this type of system motivates municipalities to support economic activity (this system is present in Croatia, Latvia and Portugal, but also in Nordic countries due to additional income tax rates). However, this does not apply to redistribution of the overall national tax pie.

Second, the structure of property taxes differs primarily in whether they reflect the value of the property. If they do reflect the value, and especially if this tax base is regularly updated, then the taxes collected are more sensitive to the real estate market trends.

Third, balancing mechanisms play a role: even in the countries where municipalities collect their own tax – for instance income taxes in Nordic countries – there is a mechanism designed specifically for balancing tax revenues and correct extremes.

3.5 Cities, Countries and Investments

Findings from the comparison of funding for strategic transportation construction projects in selected cities

In general, the most difficult is to describe how individual countries spread the costs of large infrastructure projects in cities. This data is not summarily available, and the data we collected on transportation projects indicates that not even individual countries have a consistent approach – for instance, that all large transportation projects are funded by the state (even in individual cities within one country, different construction projects might be funded differently). Decisions on how to spread the burden result from the specific nature of the given project and the negotiations surrounding it. The most striking feature is that the new EU Member States finance large portions of most of transportation construction projects (ring roads and subways) with European funds. This type of funding is limited in Prague. On average, the cities surveyed fund a larger proportion of construction costs in the case of subway projects compared to road/highway projects.

A general picture of local governments' participation on total public investments can be formed. Comparable data on the proportion of capital transfers from the states are partially available: a higher share of capital in transfers would indicate that a state has mechanisms in place to centrally fund local investments. The Czech Republic falls into this category, where roughly one-fifth of all transfers from the state to municipalities are capital transfers; this appears to be a higher proportion than in most other countries, where this information is available. The difference, however, might be due to the way European funds are managed. In recent years, one third of all local government expenditure had a source in European funds in the Czech Republic[19].

Conversely, the overview data does not show infrastructure projects in cities where the state is the primary investor. In this case, we must rely on case studies included in the cards of individual cities presented in the appendix.

19 / MMR (2017), Public expenditure and EU funds 2007–2015, https://dotaceeu.cz/cs/Evropske-fondy-v-CR/Narodni-organ-pro-koordinaci/Evaluace/Knihovna-evaluaci/Verejne-vydaje-a-fondy-EU-2007%e2%80%932015

3.5.1 MOTIVATION AND QUESTIONS

This section examines how strategic transportation construction projects are funded in selected large cities abroad. The main objective is to determine the extent and the mechanism of participation of a state, city and other financial resources (e.g. European funds, private capital etc.) in funding these types of construction projects.

3.5.2 METHODOLOGY AND SOURCES

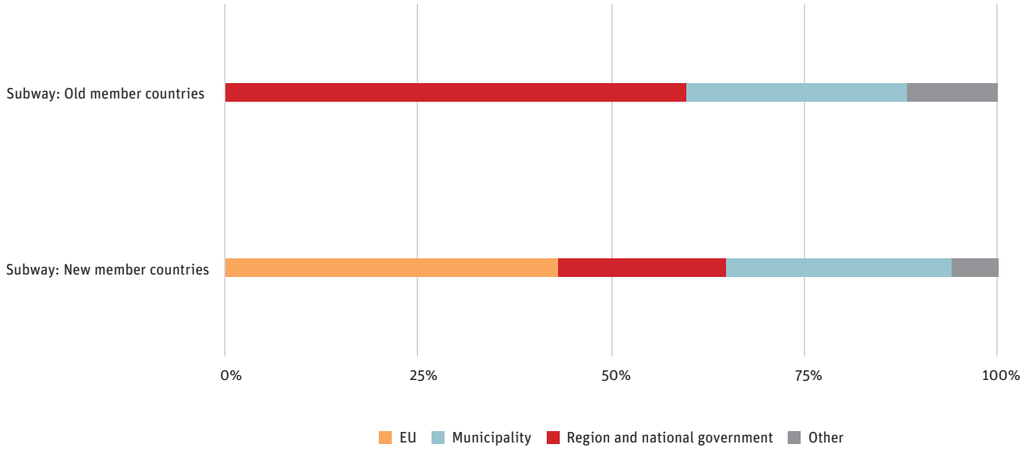
For the purposes of comparison, we have included new, extended subway lines and foreign equivalents of Prague's ring roads in the knowledge that certain key construction projects in Prague are investments of the state or its organizations, while others are investments of the city.

In August 2019, a questionnaire was sent to 22 highway infrastructure administrators and 14 subway operators in 27 European cities and regions (the same as the cities surveyed in the previous parts of the study on municipal finance systems). The subjects addressed (typically organizational units responsible for funding, strategy or construction) received a simple, structured questionnaire about certain projects constructed within the past decade (including a space for comments on other relevant projects). The respondents were asked to provide total investment costs and the proportion of funding from municipal and state budgets, regional (provincial/canton budgets), European funds, loans, private funding and other sources. The questionnaire included a field for respondents to briefly describe the project. As of 1 November 2019, we have six responses from highway infrastructure administrators, and for five other cities/regions, we found the necessary information online. (Certain responses of individual administrators applied to multiple projects). As of the same date, we have five responses from subway operators, and for two other cities/regions, we found the necessary information online.

3.5.3 MAIN FINDINGS

The analysis has yielded information without any obviously identifiable patterns, both in the case of high-capacity roads and the construction of subways. Differences between cities within a country are also evident (German and Italian cities in constructing subways, or German cities in constructing ring roads). However, it can be stated that cities generally invest more in subways than road and highway infrastructure.

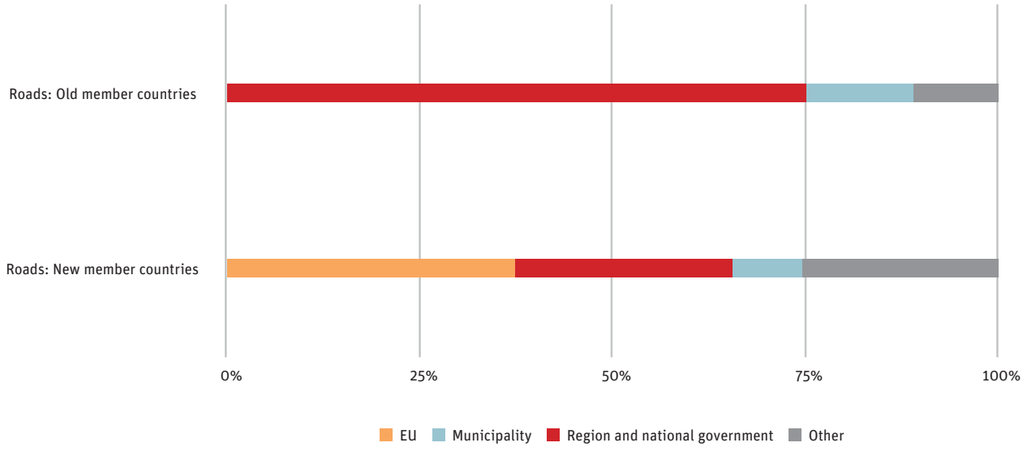
GRAPH 28 / **FUNDING SUBWAY LINES – COMPARISON OF AVERAGES (EU MEMBER STATES BEFORE AND AFTER 2004)**



Source: authors' questionnaire survey, other sources listed on city cards

In Prague, extension of the 'A' subway line was funded from EU funds (43%) and municipal budget (57%).

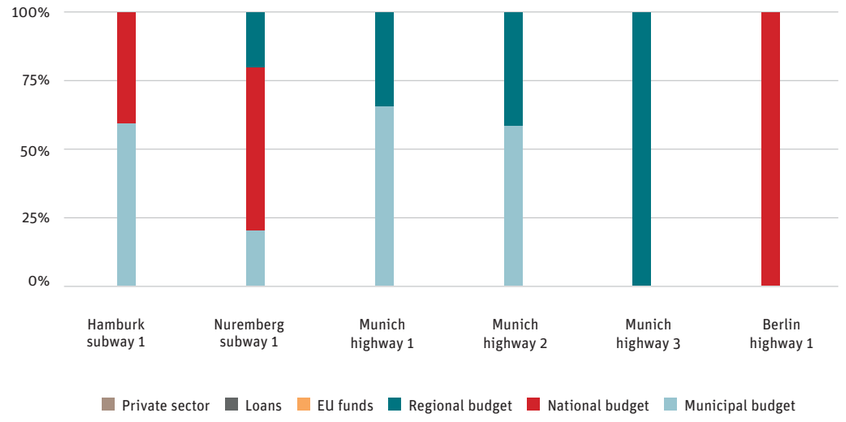
GRAPH 29 / **FUNDING ROAD/HIGHWAY CONSTRUCTION – COMPARISON OF AVERAGES (EU MEMBER STATES BEFORE AND AFTER 2004)**



Source: authors' questionnaire survey, other sources listed on city cards

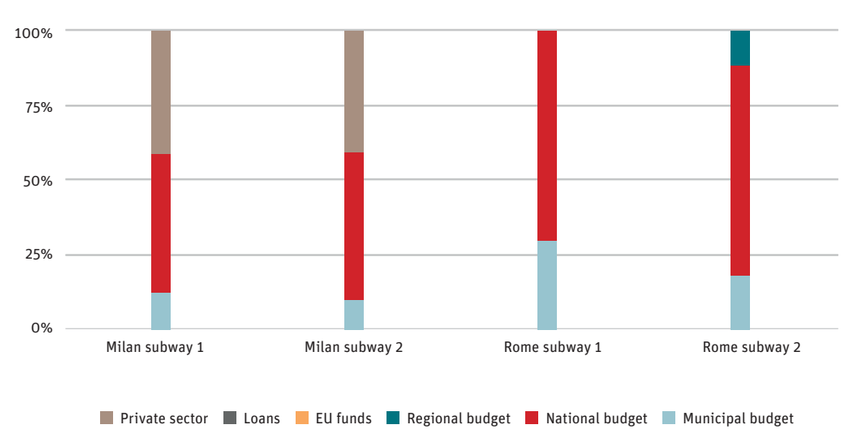
In Prague, sections of the highway bypass around Prague (Prague Ring Road) were funded from EU funds (30%) and the state (70%). The city did not contribute to funding. Conversely, sections of the City Ring Road were funded completely (100%) from the municipal budget. No other city analyzed demonstrated the same.

GRAPH 30 / **SOURCES OF INFRASTRUCTURE FUNDING IN GERMANY**



Source: authors' questionnaire survey, other sources listed on city cards

GRAPH 31 / **SOURCES OF INFRASTRUCTURE FUNDING IN GERMANY**



Source: authors' questionnaire survey, other sources listed on city cards

Transportation construction in Budapest and Warsaw[20] serving a similar role as the Prague Ring Road is funded heavily from EU funds and the national budget (transportation infrastructure administration funds). In Bratislava and Vienna[21] the construction of highway bypasses has been and continues to be funded in large part by private capital (large construction companies and transportation infrastructure developers, in Bratislava even a multi-national finance group).

In other cities surveyed[22], such construction projects were largely financed from national budgets (or the federal budget in the case of Zurich). For Munich[23], it should be noted that funding from the regional (or provincial) budget acts similarly to funding from the national budget in other countries because of Germany's federal system.

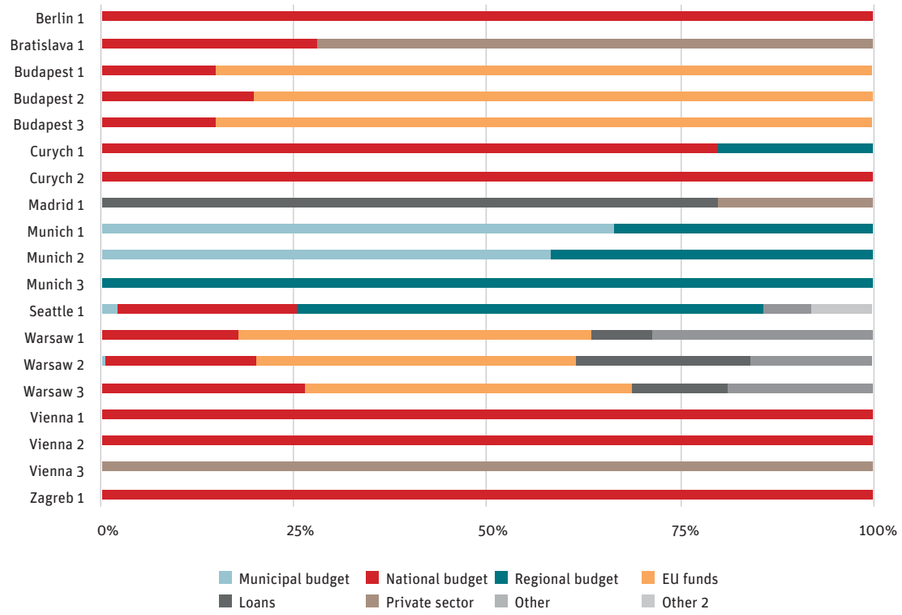
20 / Construction projects in Budapest 1, 2 and 3, Warsaw 1, 2 and 3

21 / Construction projects in Bratislava 1 and Vienna 3

22 / Construction projects in Zurich 1 and 2, Seattle 1, Vienna 1 and 2, Zagreb 1

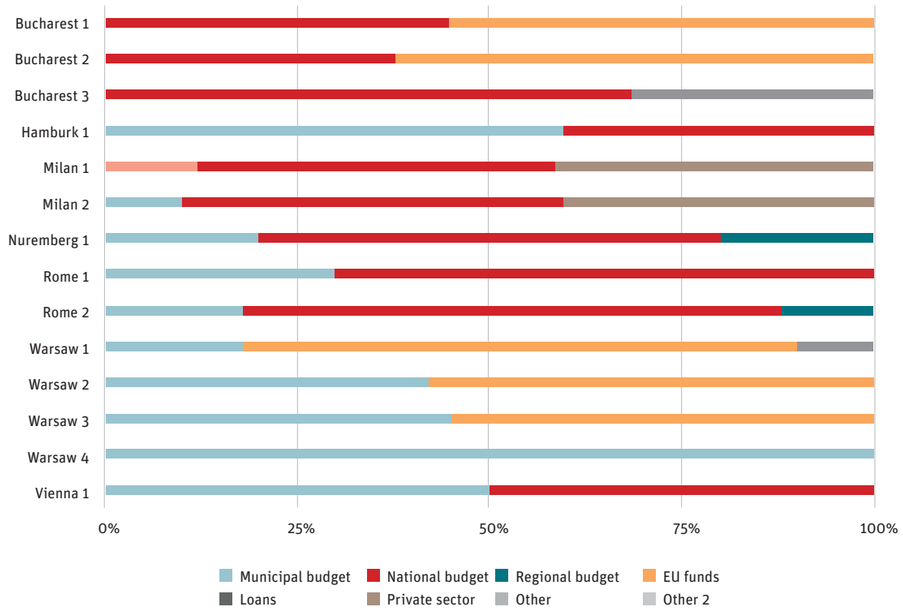
23 / Construction projects in Munich 3

GRAPH 32 / **FUNDING HIGH-CAPACITY ROADS IN SELECTED CITIES**



Source: authors' questionnaire survey, other sources listed on city cards.

GRAPH 33 / **FUNDING NEW SUBWAY LINES AND EXTENSIONS IN SELECTED CITIES**



Source: authors' questionnaire survey, other sources listed on city cards.

Transportation constructions with a similar role as Prague's Ring Road were surveyed and evaluated in Munich, Berlin and Madrid.In Munich[24] and Madrid[25], the construction projects involved digging tunnels for certain sections of high-capacity roads. In Munich, this type of construction was funded from the municipal and provincial budgets; in Madrid, it was funded with loans taken out by the City Hall and partially from private capital. Construction of the Berlin A100[26] highway, however, was fully funded from federal (central) sources.

In funding the construction of new subway lines or extending existing ones, Warsaw and Bucharest used funding from the European Union (although for the final section of line 2, Warsaw is expected to use funding purely from municipal sources, or possibly loans). National budgets played a role in subway constructions in Bucharest, Hamburg, Nuremburg, Vienna, Milan, and Rome. In Warsaw however, the state played no part in constructing the subway (but more than half was funded from EU funds in all cases).

Generally, it can be said that very few instances of infrastructure projects are funded by only a single entity[27]. In most cases, a combined funding from the city + state, the city + state + region, or the city + state + private sector takes place. In new EU member states, we often see the model of state + EU funds, while in Warsaw, it is the city + EU funds. EU funds have provided more than half of the funding in all cases.

24 / Construction projects in Munich 1 and 2

25 / Construction projects in Madrid 1

26 / Construction projects in Berlin 1

27 / Only 1 out of 14 subway projects and 7 out of 19 road projects (5 of these 7 are 100% funded from the national budget, 6 or 7 if we add the funding for Munich 3, 100% from the budget of the federal state of Bavaria).

TAB 01 / **INVOLVEMENT OF STATE FUNDS – SUBWAYS**

		Bucharest 1	Bucharest 3		
Warsaw 1		Bucharest 2	Nuremberg 1		
Warsaw 2		Hamburk 1	Rome 1		
Warsaw 3		Milan 1	Rome 2		
Warsaw 4		Milan 2	Vienna		
0 %	0–24 %	25–79 %	50–74 %	75–99 %	100 %

Source: authors' questionnaire survey, other sources listed on city cards.

TAB 02 / **INVOLVEMENT OF STATE FUNDS – MUNICIPAL HIGHWAY CONSTRUCTION**

	Budapest 1				
	Budapest 2				Berlin 1
Madrid 1	Budapest 3				Curych 2
Munich 1	Seattle 1				Vienna 1
Munich 2	Warsaw 1	Bratislava 1			Vienna 2
Vienna 3	Warsaw 2	Warsaw 3		Curych 1	Zagreb 1
0 %	0–24 %	25–79 %	50–74 %	75–99 %	100 %

Source: authors' questionnaire survey, other sources listed on city cards.

3.5.4 CONCLUSIONS

The funding mechanism for large transportation projects is, first, dependent on the structure of tax revenue redistribution and the degree of tax autonomy of municipalities and regions in individual countries, and second, reflects, to a degree, a certain "tradition" of funding for these types of projects. However, there is a difference in the degree of involvement of European funding in the countries surveyed. EU funds have contributed significantly to funding infrastructure in the new EU member states

Considering the variability of structures of funding for strategic transportation projects in the cities and regions surveyed, the different ways and "traditions" for redistributing tax revenue and also the size of the group of cities surveyed, the conclusions from this data should be interpreted in the context of the entire system of funding for strategic investments in the given country.

A widely applicable recommendation can be inferred from the observation that except for Warsaw, state funding has been used to different degrees in constructing new subway lines in all the cities surveyed[28]. States (or federal state in the case of Munich) have also contributed to funding for highway bypasses, one exception being a section of the Vienna outer ring road that was fully financed with private capital. It can be generally said that in the cities surveyed, municipalities are more involved in funding subway infrastructure than road/highway bypasses.

28 / In the case of Warsaw, it can be argued that the state's role in investment was replaced with EU funding, which in the three subway projects examined provided 55%, 58%, and 72% of funds.

Appendix No. 1

Overview cards of selected cities

Contents

For a clear summary and graphic representation of the data collected on selected local governments, we include 30 overview cards. The cards provide information in three sections: Local public finance system in the given country, municipal finance structure, and different funding mechanism for specific strategic transportation projects. The introduction on each card provides data on the city's population and economy and its metropolitan area (MA): population of city, population of MA, population change in MA over the past 5 years, GDP of MA as a percentage of average GDP EU28; average annual percentage change in GDP MA over the past 5 years.

Vybraná města

Amsterdam	Copenhagen	Rome
Barcelona	Lisbon	Seattle
Belgrade	Lyon	Sofia
Berlin	Madrid	Stockholm
Bratislava	Milan	Tallinn
Budapest	Munich	Warsaw
Bucharest	Nuremberg	Vienna
Curych	Porto	Vila Nova De Gaia
Hamburk	Prague	Vilnius
Helsinky	Riga	Zagreb

Data Sources

INTRODUCTION — POPULATION AND ECONOMY OF METROPOLITAN AREAS

City population data is taken from Eurostat, from the "Cities and greater cities" file for 2015.

Data on the population and economy of agglomerations (metropolitan areas) is taken from the OECD. Information about change over time is based on data (where available) from 2010–2015.

STATE SYSTEMS FOR FINANCING LOCAL GOVERNMENTS

Texts describing local financing systems are based on texts from the OECD and UCLG project titled "World Observatory on Subnational Government Finance and Investment". Most of the information is from 2016.

MUNICIPAL FINANCE

Data on municipal financing comes from our own data collection (forms sent for completion by officials in the cities surveyed). The data represents the actual structure of revenue and expenditures in 2018, therefore it is not data from planned budgets.

FUNDING FOR STRATEGIC TRANSPORTATION PROJECTS

Data on the funding for infrastructure projects was collected through a structured questionnaire. Questionnaires were sent to the managers of relevant infrastructure projects and then evaluated. For projects where the necessary data could be found online, the relevant web links are always listed at the bottom of the card.

The Poor City of Prague?
Prague's public finances in the Czech
and international context

05/2020

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