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ANALYSIS OF THE MAIN EXPENDITURE AND STRUCTURAL COMPONENTS OF THE EDUCATION SYSTEM IN A REGIONAL CONTEXT

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Based on the results of the author`s previous research of the fundamental and main components of the education system, this study presents actual expenditure amounts by economic classification categories for a more detailed analysis of the relationship between total costs, costs per student and per school, the average number of students and the average number of schools, and the structure of costs in the system both as a whole and at the regional level. The paper compares two groups of municipalities with similar student numbers from a regional perspective: state-cities and municipalities from the rest of the country. This study aims to statistically analyze a large number of relevant 2800 records of real data and relevant legislation. We found that while per-student spending is lower in state-cities than in the other group, this advantage is quickly eroded by other factors such as inflation, significant reward and services expenditure position increase necessitating the use of other metrics (like average expenses per school) to analyse the situation more objectively. Moreover, analysis suggests that state-cities, despite its lower per student costs, need to review and revise their school expenditure, as overall expenditure has increased by 64.7% and its relation to the national average has significantly increased by 21.6 percentage points over the five-year period. The rest of Latvia`s municipalities managed to maintain total expenditure growth rates at only +27.3% and reduce the ratio of average expenditure per school to the national average by -8.5% percentage points over the same period. This study is a part of a continuous development of a resource management model in the education system, as a contribution for better governance of finance towards sustainability of education system.

Keywords: *education system; average expenditure per student; average expenditure per school; expenditure structure, analysis.*

INTRODUCTION

Research attention regularly has been focused on the costs of the education system and schools in particular. In our study the main and fundamental components of the education system are considered the number of students per school and number of education institutions, thus they form the basis of main expenditure and structural analysis. Mutual proportions of this components are also significant part of data analysis. We found out that this is topical issue at least in last 40 years and is consistent with the view of Windelborn, who, after analyzing the factors influencing per pupil costs, acknowledged that savings were found at the school level due to the larger number of students in the school (Windelborn, 1988). Other researchers argue that school merging, thereby increasing the number of students in each school, appears to be an important tool in the cost-saving strategy in the school sector (Falch, Rønning & Strøm, 2008). Researchers have found that per student expenditures increased for the absorbing districts, while decreased minimally for the joining districts (Cooley, Floyd, 2013). These findings support the results from previous studies that even though consolidation could prove to be cost-effective in some cases, there has been no compelling evidence that consolidation is a cost-effective alternative to small rural schools (Brent, et al., 2004).

In addition, we also need to remember that the opportunity to achieve lower per student spending is more accessible to more populated areas like larger municipalities (England, Hamann, 2013). At the same time, it is important to note that schools themselves are a very important factor in the socioeconomic impact and economic vitality of local communities, especially in rural areas (Sipple, Francis & Fiduccia, 2019).

Equally important, but not the focus of this study, the benefits of school size and number of student include not only economic factors but also the academic performance of the students themselves (McCoy, 2014).

Thus, the aim of the paper is to **look at empirical evidence on the importance of the number of students in general educational institution** and whether this can be the main criterion when assessing and comparing the financial situation in terms of school expenses over the five-year period (2019 – 2023) under consideration in Latvia.

The following tasks were set:

1. Conduct a preliminary analysis to determine whether the number of students in large municipalities (state-cities) and other regional local governments is comparable for further analysis.

2. To structure the latest available data set for a five-year period, identifying important trends among the main criteria – the total and average number of students and educational institutions, as well as the expenditures corresponding to these criteria.
3. To obtain an empirical understanding of whether average per student expenditure in general education schools is sufficient to reflect a realistic and objective picture when the trend in total expenditure and expenditure per institution is also taken into account.

Regional division of groups is based on the assumption and preliminary analysis (see Tables 1, 2 and 3) that the two groups have similar numbers of students. Yet there are significant differences in the number of institutions and the average number of students in each institution, which raises scientific interest in the analysis of the costs of the education system through this prism.

Table 1. Number of students in general education schools in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, number	102,814	103,408	102,525	103,240	102,243	-0.6%
State-cities, % of total	52.3%	51.6%	51.1%	51.2%	50.6%	-1.7%pt.
Rest of Latvia, number	93,957	97,151	97,975	98,341	99,713	+6.1%
Rest of Latvia, % of total	47.7%	48.4%	48.9%	48.8%	49.4%	+1.7%pt.
TOTAL, number	196,771	200,559	200,500	201,581	201,956	+2.6%

Table 1 shows that in mentioned five-year period the share of students in state-cities is more than half and is showing a slight downward trend (-0.6%), while in the rest of the country this number is increasing (+6.1%). This confirms our assertion that the distribution of students across the country is almost identical between these two groups. A fact worth noting is that the total number of students increased (+2.6%) due to municipalities outside the state-cities.

Table 2. Number of schools in general education in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, number	164	164	166	162	151	-7.9%
State-cities, % of total	28.9%	28.8%	29.1%	28.9%	28.7%	-0.2%pt.
Rest of Latvia, number	404	405	405	398	376	-6.9%
Rest of Latvia, % of total	71.1%	71.2%	70.9%	71.1%	71.3%	+0.2%pt.
TOTAL, number	568	569	571	560	527	-7.2%

The data in Table 2 confirm a well-known trend in Latvia: the number of schools is decreasing (-7.2%) as local governments try to adapt to the migration of people and bring order to the school ecosystem. (LV portāls, 2023). The share of schools located in state-cities has been less than a third over the entire period, peaking at 29.1% in 2021, while in the rest of the country the share has always exceeded 70% (peaking at 71.3% in 2023).

Combining the data from Tables 1 and 2, in city-states with a large number of students (more than 50% of the total) and a smaller number of schools (less than 30% of the total), the average number of students per school is naturally much higher than in the rest of the country.

Table 3. Average number of students in general education per school in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, number	627	631	618	637	677	+8.0%
State-cities, % of national average	181.2%	179.1%	176.0%	177.0%	176.8%	-4.4%pt.
Rest of Latvia, number	233	240	242	247	265	+13.7%
Rest of Latvia, % of national average	67.3%	68.2%	68.9%	68.6%	69.2%	+1.9%pt.
TOTAL average in country	346	352	351	360	383	+10.7%

Table 3 shows the average number of students per school in Latvia is increasing (+10.7%), reaching 383 per school in 2023, while in state-cities the rate of increase was smaller (+8.0%) and in the rest of the country larger (+13.7%) than the national average. In state-cities, this parameter is well above the national average, peaking at 677 in 2023, while in the rest of the country – 265. However, due to the lower growth rate of this parameter in state-cities, the average number of students per school relative to the national average decreases (from 181.2% in 2019 to 176.8% in 2023), while the opposite situation is observed in the rest of the country (from 67.3% in 2019 to 69.2% in 2023), which is partly due to the different starting base.

RESEARCH METHODS

To address the set tasks the paper analyses up to date available almost 2800 data entries from Latvian National Education Information System (*Valsts Izglītības informācijas sistēma - VIIS*) about general education schools from 2019 – 2023, maintained and financed by local governments (municipalities). To process such a large amount of data statistical methods were used to analyze different data, which includes years, municipalities, students and costs per student, per institution both in overall and regionally, to assess structural share, its changes and base growth in mentioned period.

Particular attention in the analysis has been paid to the costs from its structure through economic classification codes including main expenditure categories – reward, goods & services, as well as capital investments over a five-year period. Legislative analysis is used as paper adds regional aspect by examining the 7 largest cities in the country, which, in accordance with the Law on Administrative Territories and Populated Areas, have the status of a state-city (*valstspilsēta*) and at the same time are separate municipalities (Law on Administrative Territories, 2020). At this research stage, we did not analyse individual local governments, but instead divided all schools in Latvia into two blocks and compared these groups – state-cities and other local governments across the country. This regional aspect gives valuable comparable insight of assessed main expenditure and structural components.

RESEARCH RESULTS AND DISCUSSION

Following a preliminary analysis of the main and fundamental components of the country's education system, a more specific analysis focusing on expenditure was conducted. To begin with, it should be noted that the total costs of maintaining general education schools are shown in Table 4. From 2019 to 2023, more than 1 billion EUR was spent on all schools in all municipalities, with the overall increase in spending over five years amounting to +30.7%.

Table 4. Total expenditures of maintaining general education schools in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, EUR	72,726,461	75,900,503	82,879,612	90,038,655	110,283,831	+51.6%
State-cities, % of total	36.9%	36.4%	42.4%	40.9%	42.8%	+5.9%pt.
Rest of Latvia, EUR	124,393,965	132,673,097	112,821,618	130,313,126	147,376,037	+18.5%
Rest of Latvia, % of total	63.1%	63.6%	57.6%	59.1%	57.2%	-5.9%pt.
TOTAL, EUR	197,120,426	208,573,600	195,701,229	220,351,782	257,659,868	+30.7%

The largest increase in total expenditure has been observed in state-cities (+51.6%), while in the rest of Latvia it was +18.5%. It is important to note that the share of state-cities in total expenditure increased by almost 6 percentage points - from 36.9% in 2019 to 42.8% in 2023, while the share of the rest of Latvia municipalities decreased from 63.1% to 57.2% over the same period. It should also be noted that in 2021, a drop in overall spending (-6.2% compared to 2020) should be separately identified, but the factors that caused this will be discussed in a further analysis.

Table 5. Average expenditure in general education per student in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, EUR	707	734	808	872	1,079	+52.5%
State-cities, % of national average	70.6%	70.6%	82.8%	79.8%	84.5%	+13.9%pt.
Rest of Latvia, EUR	1,324	1,366	1,152	1,325	1,478	+11.6%
Rest of Latvia, % of national average	132.1%	131.3%	118.0%	121.2%	115.8%	-16.3%pt.
TOTAL average in country, EUR	1,002	1,040	976	1,093	1,276	+27.3%

As we switch to average expenditure per student analysis, Table 5 shows that national average expenses per student peaked at 1,276 EUR in 2023, which is +27.3% increase since 2019. However, regional aspect shows big differences between state-cities and the rest of Latvia. Average expenditure per student in state-cities increased at a record pace: from 707 EUR in 2019 to 1,079 EUR in 2023 (+52.5%), while in the rest of Latvia`s municipalities, partly due to the large initial base (1,324 EUR in 2019) this growth was only +11.6% (1,478 EUR in 2023). Due to record growth rates of spending, state-cities average expenditure per student in relation to the national average also increased by 13.9 percentage points – from 70.6% in 2019 to 84.5% in 2023. While in the rest of Latvia`s municipalities average expenditure per student in relation to the national average decreased from 132.1% in 2019 to 115.8% in 2023, which is 16.3 percentage points less thereby highlighting changes in the expenditure structure of country.

Table 6. Average expenditure in general education per school in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, EUR	443,454	462,808	499,275	555,794	730,356	+64.7%
State-cities, % of national average	127.8%	126.3%	145.7%	141.2%	149.4%	+21.6%pt.
Rest of Latvia, EUR	307,906	327,588	278,572	327,420	391,958	+27.3%
Rest of Latvia, % of national average	88.7%	89.4%	81.3%	83.2%	80.2%	-8.5%pt.
TOTAL average in country, EUR	347,043	366,562	342,734	393,485	488,918	+40.9%

Table 6 shows that as the number of schools decreases (see Table 2) and expenditures increase over a five-year period, average expenditures per school increase at a faster rate than expenditures per student (Table 5). Total national average expenses per school increased from 347,043 EUR in 2019 to 488,918 EUR in 2023, an increase of +40.9%. However, regional analysis shows more detailed picture: in state-cities average expenditure per school increased for whopping +64.7% (from 443,454 EUR in 2019 to 730,356 EUR in 2023), while in the rest of Latvia`s municipalities this increase was more than twice as small (+27.3%) from 307,906 EUR to 391,958 EUR over the same period of time. State-cities average expenditure per school in relation to the national average also increased by 21.6 percentage points - from

127.8% in 2019 to 149.4% in 2023, but in the rest of Latvia`s municipalities this relation decreased from 88.7% in 2019 to 80.2% in 2023, which is 8.5 percentage points.

For a more detailed analysis, economic classification codes (ECC) are used, since they include resources used in a certain period (in our case – year) in the form of expenses. These ECC are listed in accordance with Cabinet regulation No.1031 "Rules on the classification of budget expenditures according to economic categories" (Cabinet regulation No.1031, 2005).

Three main codes have been identified that have the greatest impact on the costs of general education school (Table 7).

Reward (ECC 1000) – includes the provision of labor (mostly technical staff) resources with wages, social security contributions, benefits, compensation and health insurance.

Goods & services (ECC 2000) – include all materials, inventory and learning aid, as well services related to the performance of the institution's functions and ensuring its operation, as well as the maintenance or repair of buildings and equipment.

Capital formation (ECC 5000) – an important resource position, which includes investments in fixed assets, as well as for attracting the largest investments in case of capital repair and reconstruction. (Kupcs R., Lenerts A., (2024).

Table 7. Expenditure in general education schools by economic classification codes in Latvia in 2019 – 2023.

Codes / Years	2019	2020	2021	2022	2023	Total, EUR	Total, %
ECC 1000, EUR	93,194,626	96,287,250	101,767,377	108,151,886	120,816,498	520,217,637	48.2%
ECC 2000, EUR	81,006,048	80,804,592	78,715,991	97,828,591	117,761,112	456,116,333	42.3%
ECC 5000, EUR	21,738,530	30,310,910	13,959,293	13,432,256	17,557,275	96,998,263	9.0%
Other ECC, EUR	1,181,223	1,170,848	1,258,569	939,049	1,524,983	6,074,671	0.5%
TOTAL, EUR	197,120,426	208,573,600	195,701,229	220,351,782	257,659,868	1,079,406,905	100.0%

The largest share (48.2%) of all expenditures falls on reward position, followed by goods & services (42.3%), with both positions together accounting for 90.5%. While capital formation constitutes 9.0% and mainly determined the overall decline in expenses in 2021, when it decreased by 53.9% to 2020. Other ECC costs together account for just over 0.5% and are thus excluded from further analysis in this study due to their minor impact on the overall cost structure.

Table 8 shows the largest expenditure position in general education schools over five-year period, which increased by 29.6% overall in country and one of the main reasons for increase was rise of minimal wage (LV portāls, 2024). However, regional analysis shows that in state-cities reward increased (+39.9%) more than in the rest of Latvia`s municipalities (+22.9%). The change in the structure of reward expenditures also increased in favour state-cities (+3.2 percentage points). This indicates that state-cities were able to pay more in wages than other municipalities.

Table 8. Reward (1000 ECC) expenditures in general education schools in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, EUR	36,918,226	38,717,679	43,816,403	44,688,616	51,653,192	+39.9%
State-cities, % of total	39.6%	40.2%	43.1%	41.3%	42.8%	+3.2%pt.
Rest of Latvia, EUR	56,276,399	57,569,571	57,950,974	63,463,270	69,163,306	+22.9%
Rest of Latvia, % of total	60.4%	59.8%	56.9%	58.7%	57.2%	-3.2%pt.
TOTAL, EUR	93,194,625	96,287,250	101,767,377	108,151,886	120,816,498	+29.6%

Goods & services – another crucial expenditure position experienced even more increase +45.4% in overall (see Table 9). In state-cities, this position increased by whopping +65.1% - twice as much as in the rest of the country (+32.0%). Need to note that while in the rest of the Latvia`s municipalities expenditures on goods & services slightly decreased in year-to-year terms in 2020 (-2.9%) and 2021 (-8.5%) due to Covid-19 restrictions. However, state-cities did not see a slowdown in spending on goods & services over the same period, and continued to grow in 2020 (+3.6%) and 2021 (+5.6%), contributing to the huge overall growth over the five-year period. Nevertheless, the largest contribution to the growth of expenses on goods & services was made by inflation, which from 2019 to 2023 amounted to an impressive increase of +31.3%. (Central Statistical Bureau of Latvia, 2025). Thus, the change in the structure of goods & services expenditures also increased in favour state-cities (+5.5 percentage points).

Table 9. Goods & services (2000 ECC) expenditures in general education schools in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, EUR	32,640,883	33,821,949	35,725,604	42,560,656	53,904,408	+65.1%
State-cities, % of total	40.3%	41.9%	45.4%	43.5%	45.8%	+5.5%pt.
Rest of Latvia, EUR	48,365,165	46,982,643	42,990,386	55,267,935	63,856,704	+32.0%
Rest of Latvia, % of total	59.7%	58.1%	54.6%	56.5%	54.2%	-5.5%pt.
TOTAL, EUR	81,006,048	80,804,592	78,715,991	97,828,591	117,761,112	+45.4%

Although, capital formation makes up 9% from overall expenses in general education schools in the country, dynamic changes occurred in this position. In 2019 state-cities share in total capital formation expenditure structure was 13.7% while the rest of Latvia it was 86.3%, but five years later, in 2023, this structure changed by +9.8 percentage points in favour of state-cities (23.5%) and 76.5% respectively (see Table 10). This was due to the growth of this position over

a five-year period in state cities by +38.8%, while in the rest of Latvia's municipalities there was a decrease of -28.4%, and due to the larger share of the latter, the overall decrease in capital formation was -19.2%. It should be noted that the capital formation position is more volatile due to irregular large investments in schools (e.g. capital repairs and reconstruction) during the five-year period under consideration.

Table 10. Capital formation (5000 ECC) expenditures in general education schools in Latvia in 2019 – 2023.

Municipalities / Years	2019	2020	2021	2022	2023	2023 / 2019, %
State-cities, EUR	2,972,057	3,145,981	3,036,718	2,437,371	4,123,973	+38.8%
State-cities, % of total	13.7%	10.4%	21.8%	18.1%	23.5%	+9.8%pt.
Rest of Latvia, EUR	18,766,473	27,164,929	10,922,575	10,994,885	13,433,302	-28.4%
Rest of Latvia, % of total	86.3%	89.6%	78.2%	81.9%	76.5%	-9.8%pt.
TOTAL, EUR	21,738,530	30,310,910	13,959,293	13,432,256	17,557,275	-19.2%

CONCLUSIONS

As our study showed there were almost the same number of students in state-cities, namely in 7 individual large cities and separate municipalities, and in the rest of Latvia`s municipalities. Even more, this indicator tends to equalize in both groups, thus creating a solid basis for scientific interest, especially when comparing the two groups through the lens of expenses per student.

We compared the two groups of municipalities and found that this figure was significantly higher in state-cities (677 students per school) than in the rest of Latvia's municipalities (383 students per school) in the peak year of 2023, which confirms previous research that suggests that more densely populated areas are better able to achieve lower per student expenditures. However, structure of expenditure shows that it is undergoing significant changes - compared to the national average in state-cities, average expenditure per student has increased by 13.9 percentage points over the specified five-year period, while in other municipalities of Latvia it has decreased by 16.3 percentage points.

In terms of average expenditure per school, it is important to note that over the five-year period, there has been a two-way process - a reduction in the number of schools and an increase in overall expenditure (mainly due to inflationary pressures), which has led to a historical increase in this indicator (+40.9%).

Average expenditures per school suggests that state-cities, despite its lower per student costs, need to review and revise their school expenditure, as overall expenditure has increased by 64.7% and its relation to the national average has significantly increased by 21.6 percentage points (to 149.4%) over the five-year period. The rest of Latvia`s municipalities managed to maintain growth rates at only +27.3% and reduce the ratio of average expenditure per school to the national average by -8.5% percentage points over the same period.

The expenditure analysis showed that the items on rewards, goods & services should be examined in more detail in further research, as they account for more than 90% of total school expenditure across the public education system.

Although state-cities have lower average per-student expenditure than in the rest of Latvia`s municipalities and the national average, our analysis showed that this advantage has been eroded over the five-year period by greater increases in expenditure across all key areas. Thus, in state-cities in five-year period reward position increased +39.9% in total costs and +3.2 percentage points in relation to national average, goods & services increased +65.1% in total costs and +5.5 percentage points in relation to national average, and capital formation (+38.8% in total costs and +9.8 percentage points in relation to national average). While in rest of Latvia`s municipalities in these expenditure positions there was a significantly smaller (almost half) increase or even a decrease (as with capital formation -28.4% in total costs).

Formally, this is consistent with our assumption that a larger number of students can provide some savings to a school. However, our analysis and evidence show that due to other factors (inflation, poorly thought-out staff reward systems and inefficient use of existing resources), this advantage can quickly disappear. Therefore, other indicators, such as expenses per school, also need to be taken into account to obtain a more objective picture of the situation and make productive decisions. This is a sobering reminder that the positive performance of state-cities on specific indicators should not be assessed without proper analysis that includes trends and dynamics at the national level and in particular in the rest of the country municipalities.

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