

# Expenditure per Student in High Schools in Israel

**Nachum Blass and Haim Bleikh**

## Taub Center for Social Policy Studies in Israel

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Please cite this publication as:

Blass, N, and Bleikh, H. (2024), Expenditure per Student in High Schools in Israel. The Taub Center for Social Policy Studies in Israel.

<https://doi.org/10.5281/zenodo.11125688>

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## **Abstract**

This paper examines the budgeting of high school students in the regular State education system in Israel, including a comparison of budgeting between the Hebrew State system, the State-religious system, and the State Arab system. This is a particularly important discussion in light of the significant disparities in budget per student between schools from different supervisory authorities serving different sectors.<sup>1</sup> It should be noted that this research does not address Haredi (ultra-Orthodox Jewish) education for a number of reasons: the budgeting and operating rules in the Haredi system are entirely different from those of the others; its teachers are not included in Oz Letmura, the latest teacher wage agreement; and the overwhelming majority of boys in that education system do not take the bagrut (matriculation) exams. Therefore, the comparison between the Haredi education system and the other State education systems is irrelevant.

The analysis of the components influencing the budget per student between 2014 and 2022, based on data from the Ministry of Education's website, showed three main findings:

1. There are significant differences in budget per student in high schools between Hebrew State schools, State-religious schools, and Arab State schools. The budget per student in the State-religious system is higher than in the Hebrew State system, which is higher than in the Arab State system.

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1 In this paper, we will not address the effect of contributions by local authorities, non-profit organizations, and households. The reason is not that they have no effect on high school budgeting but rather that there is a paucity of reliable data that would enable accurate assessments of their scope.

2. After controlling for the main factors that determine budget per student, the disparities in budgeting between the different systems diminish to a large extent.
3. The disparities in budget per student between the various groups narrowed significantly during the study period.

## Introduction

The Ministry of Education' budget is the second largest among the government ministries and is currently approaching NIS 80 billion per year. Over the past decade, there has been impressive growth both in the overall budget and in expenditure per student.<sup>2</sup> There are important policy questions about how the budget is distributed among the various parts of the system and whether the allocation is based primarily on transparent and open budgeting rules, or on an intentional — though concealed — policy of discrimination or preference. If tendencies toward discrimination or preference do exist, have they improved or worsened in recent years? A further question is whether there have been changes in the level of inequality in budget per student between the various groups of students (such as Jews/Arabs, State/State-religious, etc.) in recent years.

This is the third in a series of papers published by the Taub Center which examine the budgets allocated per class and per student. Specifically, they examine the disparities in budgeting between different population groups and the factors influencing those disparities and describe the developments that have occurred since 2014 with respect to the degree of inequality in budgeting. The previous two papers (Blass & Bleikh, 2018; 2020) dealt with the primary education system, while the current article focuses on high schools in the State education system.

The first part of the paper presents the general background on budgeting in secondary education; the second describes the methodology of the research; the third examines whether there are significant differences in budgeting per student between the various sectors and supervisory authorities; and the fourth examines whether the differences in budgeting — if they exist — are the result of defined and objective budgeting formulas or perhaps an unexplained preference for certain sectors and supervisory authorities.

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2 The terms *expenditure per student* and *budget per student* are used interchangeably in this paper.

## Budgeting in high schools: General background

In Israel, as in the rest of the world, the budgeting of schools is usually done according to defined rules.<sup>3</sup> These can take the form of formulas, defined and detailed instructions, or simply general statements that provide a direction and define the vision but do not specify the details of how to allocate the budget. In general, and to the extent that the budgeting formulas are clear and well-defined, there will be less freedom of action for the heads of the education system to show preference for one sector or to discriminate against another.

The budgeting rules for high schools in Israel are defined and published each year in the form of detailed guidelines for local authorities and other entities that operate schools (NGOs and private organizations). This procedure has been a part of the high school education system history since before the establishment of the State and has changed little in the past few decades. The first law that dealt with education, i.e., the Compulsory Education Law, was enacted immediately after independence in 1948 and established that education is mandatory up to the 8th grade and that it will be provided free of charge. Initially, the State funded primary education (up to the 8th grade) based on budget per class, and if students wished to continue their education then they were charged full tuition fees by the school. Thus, the budgets of secondary schools were based on the income from tuition fees, and budgeting was per student. Over the years, the State began to provide financial assistance to students from weaker socioeconomic backgrounds who wished to attend high school. This was based on sliding tuition fees and scholarships based on parental income. When the Compulsory Education Law was expanded to additional grades, the State took over the funding of education in the higher grades by transferring tuition fees per student to the operators of the secondary schools (local authorities, educational networks, NGOs, and private organizations). To this day, there is significant variation in the method of budgeting among the various parts of the education system: in the case of primary and middle schools, the budgeting is based on teachers' work hours and the accounting unit is the class (i.e., standard hours per class), while in the case of secondary education, the budgeting is in shekels per student.<sup>4</sup>

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3 For further details, see Blass, 2015; Blass et al., 2016; Ross and Levačić, 1999.

4 The method used in the pre-school system differs from the two methods described.

The main difference between the two budgeting methods emerges in the case of schools that serve small populations and therefore have fewer students. In general, budgeting is according to weekly hours per class — a Ministry of Education term that describes the cost of one work hour over an academic year. When the number of students per class reaches a minimum (in Israel it is 20) the basic budget for educational programs set by the State does not change as long as the number of students does not exceed the set maximum (in Israel it is 40 for older primary school students and lower for younger ones). This method, ensures that even small schools can operate satisfactorily. When the budgeting is per student, a small school would have great difficulty operating due to insufficient funds to employ the necessary teaching staff, nor could it guarantee full-time employment for teachers. For example, if we assume that 40 weekly hours per class are needed in order to maintain normal educational activity and the shekel budget per student is 2 weekly hours, then a class of 20 students would barely be able to learn the basic curriculum, while a class of 40 students would allow the school to implement a full program and even add additional activities.

In Israel, as in other countries, there is in reality no pure funding model in use. In primary school education, compensation is provided for large classes that make teaching more difficult, while in secondary education, the budget per student is increased for small schools to allow them to function and provide their students a proper education.<sup>5</sup>

As noted, the budget for high schools is primarily based on a per-student shekel budget. The size of the budget is influenced by three main factors:

1. *The number of weekly hours per student* which is determined by a number of factors:
  - *Standard class size* — The Ministry of Education determines both the standard class size and the number of teaching hours required for the curriculum set for each grade, track, or stream. These two variables determine the budget per student (in terms of weekly teaching hours). They vary according to class characteristics which determine the actual budget received by the school.

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5 Therefore, the budget per student in small schools is higher than that in large schools.

- *Grade level* — 10th, 11th, or 12th.<sup>6</sup>
- *High school track* — The budgeting varies from one track to another as per the curricula requirements. Therefore, the profile of the track and their budgets, the number of students in each track, and the number of units needed for bagrut for the most part determine the size of the budget.
- *Types of classes* — For example, Lev Iyuni classes (formerly known as Mabar) and Etgar classes for weaker students, classes for students with special needs, and classes for gifted students.<sup>7</sup>
- *School size* — The Ministry of Education supplements the budgets of small schools which do not have enough budget per student to maintain the required curriculum.
- *Periphery index* — The Ministry of Education recognizes the difficulty experienced by schools in the geographic periphery in recruiting teachers and other resources and compensates them for this.
- *Bagrut remuneration* — Teachers who prepare their students for bagrut exams are compensated according to the number of study units of the exam. Therefore, the budget provided to a school will increase as more students take exams at higher bagrut levels (more bagrut units).
- *Supervisory authority* — In the State-religious system, there are unique additions such as rabbi's hours. Furthermore, the fact that the schools are gender-segregated means that small schools are more common in the system, necessitating additional budget.
- *Number of immigrant students* — A school's budget increases with the number of immigrants among its student population.
- *Number of special education students* — A school's budget increases with its number of special needs students, whether they are learning in separate classes or mainstreamed into regular classes.

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6 Thus, if the curriculum requires a budget of 40 weekly hours and the standard class size in a regular class is 30 students, the budget per student would be 1.33 weekly hours. However, if there is a desire to assist weaker students by reducing the class size to 20 students, then in the same school and for the same class the budget per student would be 2 weekly hours.

7 Lev Iyuni and Etgar classes are intended for weaker students, primarily from weak socioeconomic backgrounds. The number of students in these classes is kept low to make it easier for them to cope with the material required for the bagrut exams.

2. *Cost of a weekly hour* — The cost of a weekly hour is determined by the school's teacher profile. It will be higher in a school with teachers who are more experienced and more educated.
3. *Teaching-related expenses* — Every school has additional expenses that are not related to teachers' salaries, some of which are variable and some of which are fixed, such as additional types of manpower (for example, laboratory technicians, IT managers, librarians, etc.); administrative and service staff (secretaries and maintenance staff); and operating expenses (electricity, water, and gardening). These expenses are also reflected in the budget allocated per student.

In addition to the above, schools are allocated budgets to cover specific needs, such as participation in special programs (preparation for the IDF, volunteering in the community, life skills, etc.) or some other special need (for example, an unusually high number of students from special populations).

## Methodology

*The database* — In this study, each school is an observation. The research uses two databases of the Ministry of Education between 2014 and 2022: (a) Transparency in Education (Shkifut be Hinuh) — This database is available on the website of the Economics and Budgeting Administration and provides information on the school-level budgets and the characteristics of teachers at the school level; (b) A Wide Perspective (B'Mabat Rahav) — A data system that provides information on school characteristics (such as the number of students per grade level and types of classes in the school).

*The study population* — The research encompasses about 1,000 schools and includes high school students in the State education system who attend two types of schools: (a) schools that include both middle school grades and high school grades, known as 6-year schools (grades 7–12); (b) schools defined as high schools only, some of which are three-year schools (grades 10–12) and some of which are 4-year schools (grades 9–12).<sup>8</sup> In 2022, 356,000 students were in high school, of whom 63% were in 6-year schools that also include middle school grades, and 37% were in schools that are only high schools.

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8 A small number of schools also includes Grade 13 and 14.



*Funding for types of classes* — There are various types of classes in high schools: regular classes, Lev lyuni (formerly Mabar), Etgar, Lev Technology (formerly Hekhven), T&B (technicians and bagrut), educational centers, behavioral disorders, and others. The Ministry of Education allocates funds differently for each of type of class, and the Weekly Hours per High School Student by Grade table, published by the Ministry of Education, presents the total hours per student for each type of class by grade.<sup>9</sup> Based on this table, we constructed an index to calculate the average weekly hours per student in each school as follows: we multiplied the number of students studying in the various class types in the school by the weekly hours per student corresponding to those classes and then divided by the number of high school students at the school. This index also includes designated additions in terms of weekly hours for schools in the State-religious system and Arab State system, according to the Ministry of Education table.

*Funding for types of study tracks* — The Ministry of Education distinguishes between technological tracks and other tracks in the allocation of weekly hours per student.<sup>10</sup> For example, schools with only academic studies received the number of weekly hours per student for academic education, and so on. The Ministry of Education's data for tracks are reported for Grade 12 only, and therefore the index of tracks reflects the weekly hours per student for Grade 12 students. The weekly hours per student index for tracks is calculated as follows: we multiplied the number of students in the various tracks at the school by the weekly hours corresponding to those tracks and then divided by the number of students in Grade 12.

*Calculation of average expenditure per student* — In the Ministry of Education publications, the budget per student is calculated in groups according to sector and supervisory authority by summing all of the budgets transferred to the schools (numerator) and dividing that by the total number of high school students (denominator) in each group. In this study the average per student is calculated differently: in the first stage, the budget per student is calculated separately for each school, and then an average of these budgets is calculated. This calculation is applied in the multivariate analysis, and therefore, this method will be used throughout the study for consistency.

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9 For details, see [here](#).

10 For details, see [here](#).

## The high school system

### Student characteristics

Table 1 presents the distribution of students included in the study according to supervisory authority and sector (Hebrew State, State-religious, and Arab State), the Nurture Index,<sup>11</sup> the size of the school, and the type of school (6-year/high school only).<sup>12</sup> Several notable findings emerge from the Table. In 2022, there was a significant socioeconomic gap between the Jewish sector and the Arab sector: 69% of the students in the State Hebrew system and 65% of those in the State-religious system belonged to the two wealthiest income quintiles (quintile 1 and 2), as compared to only 8% in the Arab State system. Conversely, 81% of the students in the Arab State system belonged to the two poorest income quintiles (quintile 4 and 5), as compared to 18% of the students in the Hebrew State system and 20% in the State-religious system. Furthermore, and given the effect of school size on the budget, it is worth noting the small number of large schools and the many small and very small schools belonging to the State-religious system.

During the study period (2014–2022), there was a notable improvement in the socioeconomic profile of the students in the Jewish sector, but almost no change in the Arab sector. The figures show that the main improvement took place in State-religious system (an increase from 52% to 65% in the two wealthiest quintiles). Finally, there was in general a visible upward trend in the proportion of students in six-year schools.

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11 The Nurture Index is an index of the Ministry of Education used to classify schools by the socioeconomic composition of their study body. In the 5 point scale, 1 identifies schools with the strongest socioeconomic student population, while 5 indicates schools with students with the weakest socioeconomic status.

12 The numbers of students appear in Appendix Table 1.

**Table 1. Distribution of high school students by sector, supervisory authority, school Nurture Index, school size, and type of school, 2014 and 2022**

	2014			2022		
	Hebrew State	State-religious	Arab State	Hebrew State	State-religious	Arab State
<b>Nurture Index quintile</b>						
1 (strongest)	47%	29%	1%	52%	34%	2%
2	17%	24%	5%	17%	31%	6%
3	18%	18%	9%	13%	15%	11%
4	12%	21%	20%	12%	13%	18%
5 (weakest)	7%	9%	65%	6%	7%	63%
<b>School size</b>						
Less than 90	1%	6%	2%	1%	6%	1%
90–179	5%	31%	6%	5%	31%	5%
180–359	10%	44%	23%	10%	43%	28%
360–649	39%	19%	45%	34%	18%	49%
650–1,000	32%	—	17%	33%	1%	14%
Over 1,000	12%	—	7%	16%	—	3%
<b>Type of school</b>						
10th–12th grade in a 6-year high school	63%	69%	37%	66%	74%	50%
High school only	37%	31%	63%	34%	26%	50%

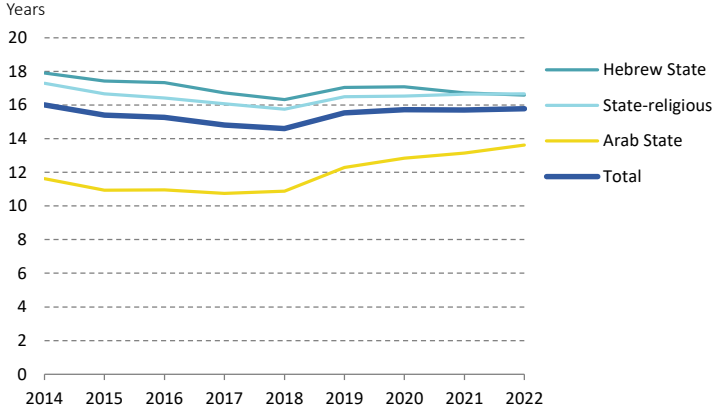
Note: In 6-year high schools, the school size refers to the high school students only.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

## Teacher characteristics

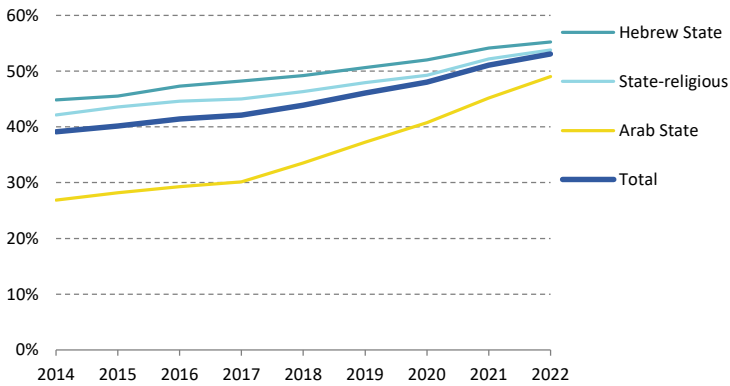
Figures 1 and 2 present the average years of teacher seniority in high schools and the teachers' levels of education. The Ministry of Education reports the median seniority of teachers for each school. Our calculation is the average of the median seniority by sector and supervisory authority. Figure 1 shows a slight decline in teacher seniority in the Jewish sector and a significant increase in the Arab sector. Figure 2 shows the growth in the share of teachers with a master's degree or higher across all sectors and supervisory authority, especially in Arab education. These changes naturally have an impact on funding. Thus, the increase in seniority and education level in the Arab sector contributed to an increase in funding, while in the Jewish sector — and particularly in the Hebrew State system — the decrease in seniority offset to some extent the increase in expenditure due to the rise in education level.

**Figure 1. Teacher seniority in high schools by school sector and supervisory authority**



Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

**Figure 2. Share of teachers with a master's degree or higher in high schools by school sector and supervisory authority**



Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

## Expenditure per student

The following is a discussion of the distribution of budget per student in the high school system. It is important to note that the results in Table 2 refer only to the budget allocated by the Ministry of Education and do not include budgets allocated to schools by local authorities, parents, and, non-governmental foundations. The analysis is carried out at the student level. In addition, the data presented below include the budgetary supplements received by the schools during the COVID-19 period.<sup>13</sup>

The results presented in Table 2 are clear and unambiguous.<sup>14</sup> During the study period, the highest budget per student was in the State-religious system while the lowest was in the Arab State system. At the same time, the increase in budget per student during this period was 73% in the Arab State system as compared to 51% in the State-religious system and 41% in the Hebrew State system.

Analyzing the changes in budget per student according to the school Nurture Index shows that there was an increase of about 50% in all quintiles between 2014 and 2022. Furthermore, the gap in budget per student between the weakest quintile (quintile 5) and the strongest (quintile 1) — which is an indicator of the degree of affirmative action in secondary education — grew from 15% in 2014, to 21% in 2019, but dropped back to 17% in 2022. Also of interest is that the funding of students in quintile 4 was higher than that in the quintile 5 across the study period. The reason for this is the sizable weight of students in quintile 5 (over 60%) in the Arab State system, alongside a significantly lower average budget than in the Jewish system (Table 3). Finally, a significant increase of 87% in the budget took place in schools with fewer than 90 students as compared to an increase of only 40% to 50% in medium-sized and large schools.

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13 We also examined the data without the supplements received by the schools during the COVID-19 period and obtained similar results.

14 The calculation of average expenditure per student presented in this table and in the study as a whole differs from that of the Ministry of Education, as explained previously in the methodology section.

**Table 2. Expenditure per student in high school by sector, supervisory authority, school Nurture Index, and school size**

NIS thousand, current prices

	2014	2015	2016	2017	2018	2019	2020	2021	2022	Percent change 2014-2022
<b>Sector/Supervisory authority</b>										
Hebrew state	26.5	28.0	29.6	31.9	34.2	35.9	35.7	36.5	37.4	41%
State-religious	29.4	31.6	34.5	39.4	42.1	45.2	42.1	43.3	44.3	51%
Arab state	18.0	19.1	21.2	22.8	24.8	27.7	28.7	30.3	31.2	73%
<b>Nurture Index quintile</b>										
1 (strongest)	22.1	23.3	24.9	27.8	30.1	31.5	31.2	32.1	32.8	49%
2	25.9	27.4	29.2	32.3	33.9	36.3	36.4	37.6	39.3	52%
3	27.4	29.6	32.9	34.9	37.8	38.9	37.9	38.7	40.0	46%
4	27.6	29.2	31.0	35.1	37.3	39.9	39.4	40.8	40.7	47%
5 (weakest)	25.5	26.7	28.4	30.8	33.2	37.9	36.1	37.9	38.4	51%
<b>School size</b>										
Fewer than 90	22.0	25.4	28.9	34.0	36.6	41.1	39.1	40.0	41.0	87%
90–179	28.8	31.0	33.0	36.3	40.6	43.8	41.8	43.1	44.1	53%
180–359	26.3	27.5	29.6	32.2	33.4	35.8	36.0	37.5	38.0	45%
360–649	23.5	24.5	25.8	27.5	29.6	31.1	31.0	32.2	33.2	41%
650–1,000	21.3	22.2	23.9	25.7	27.5	28.9	29.1	30.0	30.5	44%
Over 1,000	19.9	21.1	22.7	24.3	26.3	27.6	28.1	28.8	29.7	49%
Total	25.0	26.6	28.7	31.5	33.8	36.4	35.6	36.7	37.7	51%

Note: In 6-year high schools, the school size refers to the high school students only.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

**Table 3. Expenditure per student in high school by sector, supervisory authority, and school Nurture Index, 2014-2022**

NIS thousand, current prices

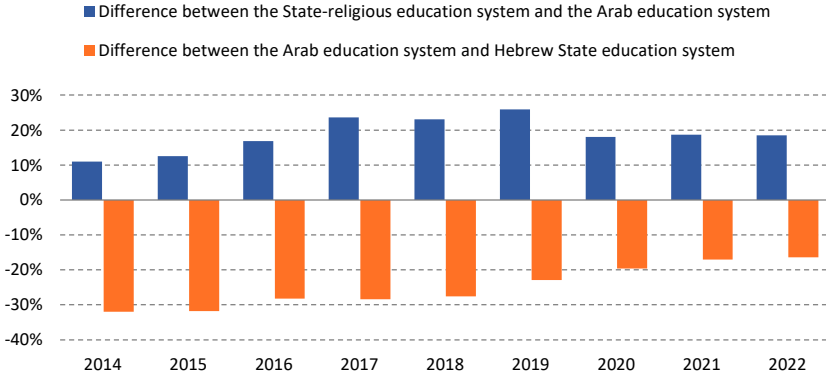
	School Nurture Index					Total
	1 (highest)	2	3	4	5 (lowest)	
<b>2014</b>						
Hebrew State	21.4	26.0	27.8	29.8	36.5	26.5
State-religious	23.8	28.3	30.5	34.2	37.1	29.4
Arab State	18.3	15.0	17.5	18.1	19.3	18.0
<b>Total</b>	<b>22.1</b>	<b>25.9</b>	<b>27.4</b>	<b>27.6</b>	<b>25.5</b>	<b>25.0</b>
<b>2022</b>						
Hebrew State	31.0	36.9	38.3	42.0	50.5	37.4
State-religious	36.7	43.4	47.8	50.8	55.2	44.3
Arab State	27.6	28.6	29.5	29.7	32.5	31.2
<b>Total</b>	<b>32.8</b>	<b>39.3</b>	<b>40.0</b>	<b>40.7</b>	<b>38.4</b>	<b>37.7</b>
<b>Difference between 2014-2022</b>						
Hebrew State	45%	42%	38%	41%	38%	41%
State-religious	54%	54%	57%	49%	49%	51%
Arab State	51%	90%	69%	64%	68%	73%
<b>Total</b>	<b>49%</b>	<b>52%</b>	<b>46%</b>	<b>47%</b>	<b>51%</b>	<b>51%</b>

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

The data presented above show, among other things, the narrowing of the gap in funding per student between the Arab sector and the Jewish sector, as can be seen in Figure 3. Between 2014 and 2022, the gap in average expenditure per student between the Arab State system and the Hebrew State system was halved (from 32% to 16%), and the gap between the Arab State system and State-religious system dropped from 39% to 29%. Within the Jewish system, the data indicate a mixed trend: the gap in average expenditure per student between the State-religious system and the Hebrew State system grew from 11% in 2014 to 26% in 2019 but dropped to 19% in 2022.

### Figure 3. Disparities in per student expenditure in high school, by sector and supervisory authority

Relative to Hebrew State education



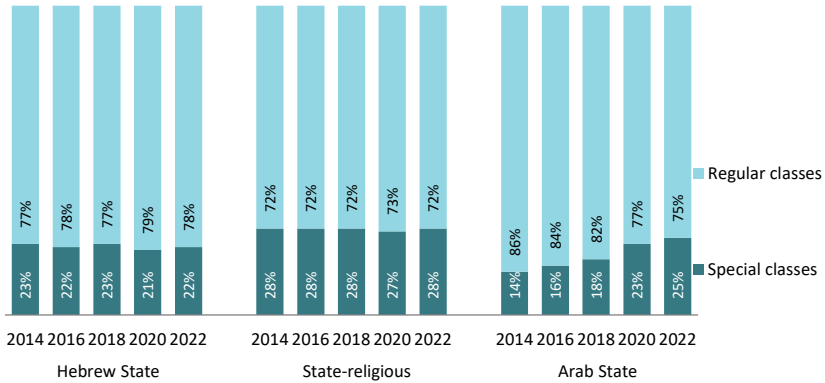
Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

A possible explanation for this change is the recognition within the government and the Ministry of Education of the large disparities in funding between the two sectors and the need to reduce them. In August 2016, a government decision was made to formulate a differential funding model for the high school system. In 2019, the Ministry of Education decided to implement a pilot program in the Arab sector, which was meant to last five years at a cost of about NIS 500 million (Moshe, 2021).

Indeed, and as can be seen in Figure 4, the share of students in special classes, such as Lev Iyuni and Etgar classes (where the cost per student is particularly high), has increased in the Arab sector and remained unchanged in the Jewish sector.



**Figure 4. Distribution of students by type of class, sector, and supervisory authority**



Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

In summary, it can be said that, in the Arab sector, there was growth in the proportion of students that entitle the school to an increased budget, while in the Jewish sector there was no such growth. The increase in budget per student in the Arab State system was also due to the previously noted change in the teacher profile in terms of seniority and education level (which, as noted, affects the budget), which was more pronounced in the Arab sector, and also the increase in the share of technological education in the Arab sector (Haddad Haj-Yahya et al., 2021; Yanay et al., 2019).

## Multivariate analysis

One of the main objectives of this study is to determine the extent to which the official budgeting formulas explain the large disparities in budget per student between the sectors and supervisory authorities. The descriptive data presented only partially explain the differences in budgeting between the sectors and supervisory authorities due to the correlations that exist between the different factors. To obtain a more accurate picture of the variables' direct effects on the differences in budget per student, we conducted a multivariate analysis (linear regression). The dependent variable is budget per student at the school level (in natural logarithms), while the explanatory variables include

teacher characteristics, the school Nurture Index, school size, the periphery index, special remunerations, class type, and study tracks, in addition to a number of other unique characteristics.<sup>15</sup> The analysis focused on two main aspects: the unique effect of each characteristic on the budget when all other variables are held constant, and its relative contribution to the model's explanatory power.

The results of the analysis are presented in Appendix Table 2. The Table presents six equations (one for each year) for the factors that affect budget per student between 2017 and 2022. In this section, we focus on a shorter period than the one examined in the descriptive analysis (i.e., 2014–2022), since data on students studying in technological tracks are only available from 2017 onwards. The following is a summary of the results for all schools.

The effects of the various variables on budget per student are in the expected directions. First, it is evident that the seniority and education level of teachers positively affect expenditure per student.<sup>16</sup> Furthermore, the data show that an increase in the size of the school has a negative effect on expenditure per student. In addition, expenditure per student is higher in schools where there is a remuneration for bagrut preparation relative to schools without such a remuneration. The variables for class type and study tracks also have a positive and strong effect.<sup>17</sup> Overall, these findings are consistent over the years. Finally, the school Nurture Index has a positive effect, that is, students from weaker socioeconomic backgrounds receive a larger budget, although it appears that the degree of differentiation (the rate of increase in the budget as the school Nurture Index increases) has declined over time.

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15 Other characteristics included in the multivariate model: whether the school has immigrant/gifted students; whether the school has a computerization program (assimilation of technological infrastructure for pedagogical and administrative needs); whether the school has gender separation; and type of school – 3-year/4-year/6-year.

16 The relationship between seniority/education level and expenditure per student is not linear and therefore a squared variable was added.

17 The relationship between the index of weekly hours for class types and expenditure per student is not linear and therefore a squared variable was added.

Table 4 describes the disparities in budget per student between the Arab State system and the State-religious system relative to the Hebrew State system before and after controlling for school characteristics and teacher characteristics.<sup>18</sup> The data point to several significant insights:<sup>19</sup>

1. There is a hierarchy in budget per student by sector and supervisory authority. The State-religious system is ranked first, followed by the State Hebrew system, and finally the Arab State system.
2. The gaps in budget per student among the groups narrow to a large extent after including a range of explanatory variables in the model. In 2022, however, this trend halted and even reversed, for reasons unclear to us at this time.
3. A sharp and continuous decline is observed in the budget per student gaps between the Jewish sector (Hebrew State system and State-religious system) and the Arab sector (before and after controlling for the explanatory variables).
4. The multivariate analysis succeeds in explaining about 80%–85% of the variation in expenditure per student across the years. In other words, a significant percentage of the disparities in budgeting per student is explained by the budgeting formulas (Appendix Table 2).

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18 The results in Table 4 are slightly different from those in Figure 3. Figure 3 takes into consideration all educational institutions. In contrast, Table 4's results before and after controlling for explanatory variables is for the same as the number of institutions for which there is complete data on these variables. Data on the explanatory variables were complete for 91%–93% of the institutions over the period. The percentages presented in Appendix Table 3 are in log points, as is common practice.

19 The data for the different years imply that in between 5% and 7% of schools (the vast majority of which are in the Arab sector) students do not take bagrut exams. In these schools, the expenditure per student is significantly lower. Since these schools are considered to be the exception that does not prove the rule, we ran an additional regression for schools whose students take the bagrut exams only. The results are reported in Appendix Table 4. Generally, the conclusions regarding the disparities in expenditure per student in the case of schools whose students take the bagrut exams do not differ from those for all schools, as presented.

**Table 4. The gaps in expenditure per student, by sector and supervisory authority, 2017–2022**

	2017	2018	2019	2020	2021	2022
<b>Without controlling for explanatory variables (relative to Hebrew State)</b>						
State-religious	24%	23%	26%	21%	21%	20%
Arab State	-29%	-29%	-25%	-20%	-17%	-16%
<b>After controlling for explanatory variables (relative to Hebrew State)</b>						
State-religious	11%	9%	9%	7%	7%	7%
Arab State	-21%	-20%	-19%	-14%	-10%	-13%

Note: All results are at the 1% significance level.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

### The contribution of the explanatory variables to differences in per student budget between schools

In the final stage of the analysis, the relative contribution of the variables to explaining the variance in budget per student was estimated.<sup>20</sup> Table 5 ranks the groups of explanatory variables, from highest to lowest, according to their contribution to explaining the variance in budget per student between 2017 and 2022.

As noted, the statistical models succeed in explaining between 80% and 85% of the variance in budget per student for the period examined. The most prominent result is the relative contribution of class type and study tracks in explaining the variance. It also appears that there is an increasing trend over time in the relative contribution of these variables to explaining the variance (from 31% to 36%).

20 The relative contribution of the groups of explanatory variables was calculated using the Shapley decomposition. For further details about this procedure, see Huettner and Sunder, 2012.

On the other hand, the relative contribution of the variable of interest in this research, i.e., sector and supervisory authority, is much smaller and decreases from 14% in 2017 to 9% in 2022.<sup>21</sup>

Another interesting result is the relatively small cumulative effect of the school Nurture Index and the periphery index on the budget variance.<sup>22</sup> Given these findings, the question arises as to whether the criteria for budgeting are appropriate from a national perspective and whether they are equitable and justified from a value perspective. It may be valid and proper to reconsider them and to increase the weight of the socioeconomic status and periphery components in the budgeting of high schools, to better reflect the differences in the students' socioeconomic backgrounds. However, this question goes beyond the scope of the current discussion.

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21 We tested models comparing budget per student between Jewish and Arab sectors and models for the Jewish population only that compare between the Hebrew State system and the State-religious system. The contribution of the variables to explaining the variance in budget per student in these models is reported in Appendix Table 5 and 6. In those models, the contribution of the sector variable to explaining the difference in budget per student between Jewish and Arab schools was higher than the contribution of the supervisory authority in the comparison between the Hebrew State system and the State-religious system. There was a significant decrease over the years in the contribution of the sector variable in the comparison between the Jewish and Arab school sectors (from 11% in 2017 to 6% in 2022), as can be seen in Appendix Table 5. In the analysis of the Jewish education sector there were almost no changes in the contribution of the variable supervisory authority (Appendix Table 6).

22 The contribution of the Nurture Index to explaining the variance in budget per student in official primary education in Grades 1–6 reached 19% in 2017 (Weiss, 2019, p. 35).

**Table 5. Contribution of explanatory variables as a percent of total variance, 2017–2022**

	2017	2018	2019	2020	2021	2022
Type of classes, study tracks	31%	30%	31%	32%	36%	36%
School size	7%	7%	8%	9%	11%	11%
Sector/Supervisory authority	14%	13%	12%	10%	10%	10%
Teacher profile	10%	10%	7%	7%	7%	7%
Bagrut remuneration	11%	10%	8%	10%	10%	10%
Nurture Index quintile + periphery index	7%	8%	7%	6%	7%	7%
School profile	7%	7%	7%	6%	5%	5%
Unexplained variance	14%	15%	21%	20%	16%	16%

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

## Conclusion

In this study, we sought to thoroughly examine the claim of significant disparities in the budgeting of high schools between schools in the State-religious education system and those in the Hebrew and Arab State education systems. To this end, we examined the budgets of all schools with students in the high school grades (in 3-year, 4-year, and 6-year schools), accounting for characteristics of the school (class types, teacher profiles, the Nurture Index, and the like) and their impact on the size of the budget. The findings were unequivocal:

1. Throughout the period, there was a gap in budgeting on average between the Hebrew State-religious system and the Hebrew State system, and even more so between the former and the Arab State system. However, a persistent reduction was observed in the budgeting gap per student between the Jewish and Arab State sectors — both before and after controlling for the explanatory variables.
2. In the multivariate analysis, after controlling for explanatory variables, the budget gaps between the Arab State system and the Hebrew State-religious system narrowed from 28% in 2017 to 19% in 2022; between Arab State education and Hebrew State education the gaps narrowed in the same years from 21% to 13%; and between Hebrew State and State-religious education, the gaps narrowed from 11% to 7%.

3. Most of the disparities in budgeting per student (between 80% to 85% depending on the year) are explained by the budgeting formulas, which are clear and transparent guidelines that can be viewed as capturing neutral factors. These include the types of classes in the school, the study tracks offered to students, the school's size, etc. However, a budgeting formula naturally reflects the positions and values of those who decided on it; decision makers with a different worldview and different values might decide on a different formula, which would lead to different outcomes.
4. There is evidence that the positive processes noted in the previous two points halted in 2022, for reasons that are unclear at this stage.

This study highlights the point that when there is a desire and determination on the part of the government and the Ministry of Education to implement policy, and in particular in the Arab State education system, they have the tools to do so. The decisions made by the government to reduce the gaps between Jewish and Arab society (Decision 922 in 2015 and Decision 550 in 2022) are clear evidence of this.

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## Appendix

**Appendix Table 1. Number of students in high schools, 2014–2022**

Thousands

	Hebrew State	State -religious	Arab State	Total
2014	171.2	49.3	91.6	91.6
2015	175.0	50.2	95.8	95.8
2016	177.4	50.7	99.2	99.2
2017	179.2	50.3	100.8	100.8
2018	180.9	51.3	103.4	103.4
2019	184.9	52.5	104.7	104.7
2020	188.9	54.1	104.3	104.3
2021	194.7	56.1	105.0	105.0
2022	195.8	57.0	102.8	102.8

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

**Appendix Table 2. Multivariate analysis of the reasons for the disparities in per student budgets, 2017–2022**

	2017	2018	2019	2020	2021	2022
<b>Sector/Supervisory authority (Reference group: Hebrew State education)</b>						
State-religious	0.101***	0.0883***	0.0893***	0.0716***	0.0665***	0.0709***
Arab State	-0.232***	-0.217***	-0.208***	-0.146***	-0.107***	-0.137***
<b>Teacher profile</b>						
Median teaching seniority	0.0327***	0.0368***	0.0349***	0.0176***	0.0300***	0.0304***
Median seniority squared	-0.000691***	-0.000835***	-0.000809***	-0.000337**	-0.000644***	-0.000689***
% of teachers with master's degree or higher	0.938***	0.810***	0.965***	1.394***	0.949***	1.274***
% of teachers with master's degree or higher squared	-0.704***	-0.650**	-0.731***	-1.171***	-0.753***	-0.950***
<b>Nurture Index (Reference group: first quintile, strongest)</b>						
2	0.0407**	0.0257*	0.0235	0.0522***	0.0331**	0.0326***
3	0.0398**	0.0486***	0.0360**	0.0287	0.0442***	0.0427***
4	0.0951***	0.0765***	0.0709***	0.0515***	0.0475***	0.0226
5 (weakest)	0.119***	0.115***	0.105***	0.0705***	0.0558***	0.0437**
<b>School size (Reference group: fewer than 90)</b>						
90–179	-0.0483*	-0.0726***	-0.0826**	-0.0610***	-0.0578***	-0.0919***
180–359	-0.122***	-0.125***	-0.128***	-0.108***	-0.105***	-0.136***
360–649	-0.193***	-0.215***	-0.214***	-0.202***	-0.207***	-0.234***
650–1,000	-0.242***	-0.256***	-0.248***	-0.237***	-0.241***	-0.275***
Over 1,000	-0.233***	-0.247***	-0.250***	-0.234***	-0.253***	-0.273***

**Appendix Table 2 (continued). Multivariate analysis of the reasons for the disparities in per student budgets, 2017–2022**

	2017	2018	2019	2020	2021	2022
Periphery index	-0.0367***	-0.0429***	-0.0414***	-0.0313***	-0.0301***	-0.0300***
Separate gender classes	0.00359	0.00432	0.0147	-0.0173	-0.02	-0.026
ICT program	-0.00859	-0.00547	0.00869	0.0171	0.00294	0.0136
<b>Remunerations (Reference group: low)</b>						
Medium	0.0624**	0.0961***	0.119***	0.0859**	0.047	0.0809*
High	0.0726**	0.107***	0.140***	0.124***	0.0847**	0.120***
<b>Bagrut remuneration (Reference group: none)</b>						
Partial	0.503***	0.508***	0.391***	0.503***	0.470***	0.401***
Full	0.404***	0.398***	0.346***	0.380***	0.385***	0.317***
<b>Institution type (Reference group: 6-year school)</b>						
Multi-year	-0.0154	-0.0323**	-0.00627	-0.0152	0.00201	-0.0107
4-year high school	0.0173	-0.012	-0.0246	0.0102	0.0223	0.00571
Has new immigrants	-0.0614**	-0.0261	-0.0386	-0.0198	0.0154	-0.0308
Has gifted students	0.0174	-0.00299	0.0107	0.0241	0.0214	0.0191
Weekly hours index	0.586***	0.439***	0.349***	0.459***	0.475***	0.507***
Weekly hours index squared	-0.0657***	-0.0371***	-0.0155	-0.0417***	-0.0453***	-0.0500***
Weekly hours for tracks in Grade 12	0.138***	0.191***	0.144***	0.141***	0.0781**	0.105***
Constant	8.344***	8.512***	8.702***	8.571***	8.683***	8.611***
Number of observations	912	938	956	959	969	985
R <sup>2</sup>	0.859	0.853	0.793	0.801	0.845	0.841

Significance levels: \* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

Note: This table uses robust standard errors. In 6-year high schools, the school size refers to the high school students only.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

**Appendix Table 3. Disparities in per student expenditure, by sector and supervisory authority, 2017–2022**

	2017	2018	2019	2020	2021	2022
<b>Without controlling for explanatory variables (relative to Hebrew State)</b>						
State-religious	21%	21%	23%	19%	19%	19%
Arab State	-35%	-34%	-28%	-22%	-19%	-18%
<b>After controlling for explanatory variables (relative to Hebrew State)</b>						
State-religious	10%	9%	9%	7%	7%	7%
Arab State	-23%	-22%	-21%	-15%	-11%	-14%

Note: All results are at the 1% significance level. The percentages in the table are in log points, as is common practice.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

**Appendix Table 4. Multivariate analysis of the reasons for disparities in per student budget for institutions that prepare their students for bagrut, 2017–2022**

	2017	2018	2019	2020	2021	2022
<b>Sector/Supervisory authority (Reference group: Hebrew State education)</b>						
State-religious	0.107***	0.0876***	0.0890***	0.0715***	0.0721***	0.0640***
Arab State	-0.219***	-0.202***	-0.195***	-0.146***	-0.0996***	-0.132***
<b>Teacher profile</b>						
Median teaching seniority	0.0316***	0.0363***	0.0372***	0.0185***	0.0314***	0.0326***
Median seniority squared	-0.000666***	-0.000821***	-0.000872***	-0.000367**	-0.000688***	-0.000750***
% of teachers with master's degree or higher	0.665***	0.361	0.745**	1.025***	0.782***	0.857**
% of teachers with master's degree or higher squared	-0.382	-0.152	-0.514*	-0.803***	-0.595**	-0.577*
<b>Nurture Index (Reference group: first quintile, strongest)</b>						
2	0.0429***	0.0270*	0.0253	0.0559***	0.0329**	0.0347***
3	0.0416**	0.0507***	0.0395**	0.0342*	0.0456***	0.0494***
4	0.0945***	0.0809***	0.0758***	0.0579***	0.0456***	0.0321**
5 (weakest)	0.117***	0.112***	0.107***	0.0756***	0.0543***	0.0492***
<b>School size (Reference group: fewer than 90)</b>						
90–179	-0.0542**	-0.0805***	-0.0750**	-0.0457**	-0.0498**	-0.0760***
180–359	-0.127***	-0.131***	-0.118***	-0.0943***	-0.0958***	-0.123***
360–649	-0.201***	-0.227***	-0.210***	-0.190***	-0.201***	-0.221***
650–1,000	-0.248***	-0.268***	-0.242***	-0.223***	-0.235***	-0.260***
Over 1,000	-0.246***	-0.258***	-0.249***	-0.222***	-0.250***	-0.260***

**Appendix Table 4 (continued). Multivariate analysis of the reasons for disparities in per student budget for institutions that prepare their students for bagrut, 2017–2022**

	2017	2018	2019	2020	2021	2022
Periphery index	-0.0370***	-0.0413***	-0.0393***	-0.0297***	-0.0292***	-0.0279***
Separate gender classes	-0.00752	0.00354	0.0144	-0.0169	-0.0272	-0.0157
ICT program	-0.00523	-0.0000541	0.0114	0.0216	0.00359	0.0174*
<b>Remuneration (Reference group: low)</b>						
Medium	0.0424	0.0568	0.0810**	0.0518	0.0138	0.0293
High	0.0554*	0.0704*	0.104**	0.0918**	0.0524	0.0681
<b>Bagrut remuneration (Reference group: none)</b>						
Partial	0.438***	0.379***	0.229**	0.404***	0.395***	0.255***
Full	0.358***	0.303***	0.207***	0.298***	0.323***	0.204***
<b>Institution type (Reference group: 6-year school)</b>						
Multi-year	-0.0113	-0.0305*	-0.00288	-0.0131	0.00643	-0.00898
4-year high school	0.0113	-0.0146	-0.023	0.00744	0.0211	0.00768
Has new immigrants	-0.0464*	-0.0113	-0.0264	-0.0159	0.023	8.464***
Has gifted students	0.0158	-0.00841	0.0109	0.0237	0.0215	0.0196
Weekly hours index	0.593***	0.451***	0.350***	0.459***	0.512***	0.513***
Weekly hours index squared	-0.0673***	-0.0401***	-0.0163	-0.0424***	-0.0533***	-0.0522***
Weekly hours for tracks in Grade 12	0.134***	0.173***	0.129***	0.136***	0.0839**	0.0962***
Constant	8.464***	8.756***	8.909***	8.757***	8.747***	8.854***
Number of observations	883	907	930	935	944	963
R <sup>2</sup>	0.814	0.803	0.737	0.740	0.799	0.796

Significance levels: \*p < 0.10; \*\*p < 0.05; \*\*\*p < 0.01.

Note: In 6-year high schools, the school size refers to the high school students only.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

**Appendix Table 5. Contribution of explanatory variables to the reasons for disparities in per student budget in high schools, 2017–2022**

	2017	2018	2019	2020	2021	2022
Type of classes, study tracks	31%	30%	31%	32%	36%	36%
School size	8%	8%	9%	10%	12%	11%
Bagrut remuneration	11%	10%	9%	11%	10%	9%
Teacher profile	10%	10%	7%	7%	7%	9%
Nurture Index quintile + periphery index	7%	8%	7%	7%	7%	7%
Sector	11%	11%	9%	7%	7%	6%
School profile	7%	8%	7%	6%	5%	6%
Unexplained variance	15%	15%	21%	20%	16%	16%

Note: This table does not examine the contribution of the variable of supervisory authority; it looks at sector alone — that is, Jewish or Arab. The other explanatory variables are the same as in Appendix Table 2. In 6-year high schools, the school size refers to the high school students only.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education

**Appendix Table 6. Contribution of explanatory variables in the reasons for disparities in per student budget in high schools in the Hebrew education system, 2017–2022**

	2017	2018	2019	2020	2021	2022
Type of classes, study tracks	36%	35%	34%	33%	39%	41%
Nurture Index quintile + periphery index	17%	17%	15%	14%	15%	14%
School size	11%	11%	10%	11%	12%	12%
School profile	5%	5%	5%	4%	4%	4%
Supervisory authority	4%	5%	4%	4%	4%	4%
Teacher profile	4%	4%	3%	3%	4%	3%
Bagrut remuneration	1%	1%	0%	3%	2%	1%
Unexplained variance	22%	22%	29%	29%	20%	21%

Note: This table examines the contribution of the variable of supervisory authority in the Jewish sector alone, that is, in the State Hebrew and State-religious school systems. The other explanatory variables are the same as in Appendix Table 2. In 6-year high schools, the school size refers to the high school students only.

Source: Nachum Blass and Haim Bleikh, Taub Center | Data: Ministry of Education