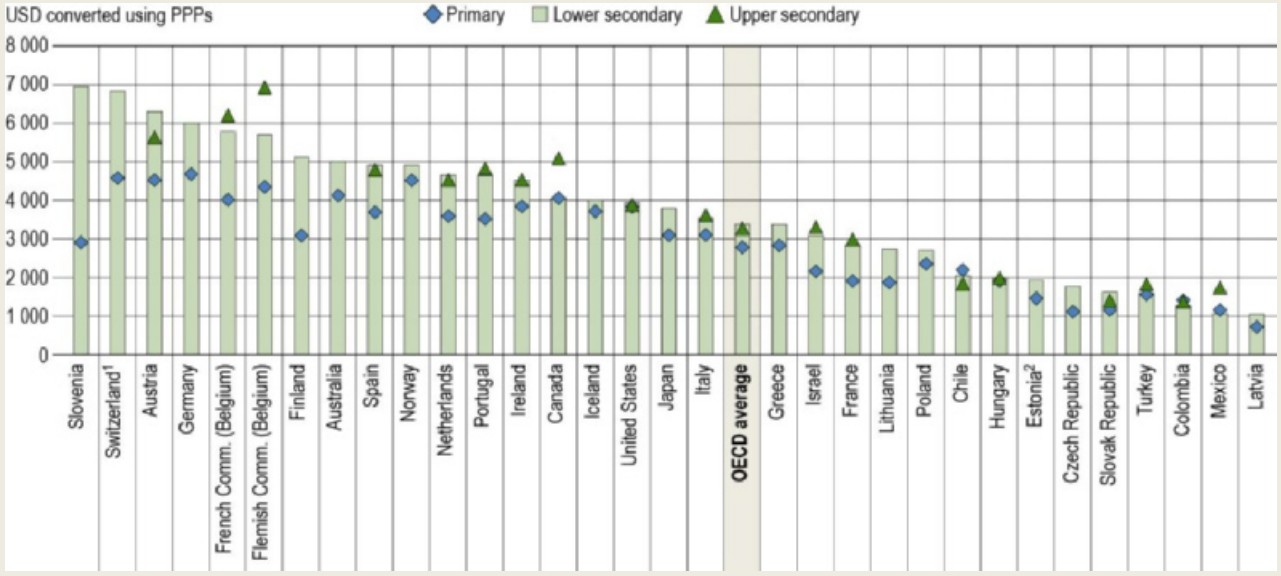
Indicator C7. Which factors influence teachers' salary cost?

Highlights

- This analysis calculates the salary cost of teachers per student using four factors: teachers' salaries, students' instruction time, teachers' teaching time and theoretical class size (see *Definitions* section). Different levels of salary cost of teachers per student result from various different combinations of these four factors.
- On average across OECD countries, the salary cost of teachers per student rises from USD 2 784 in primary education to USD 3 380 in lower secondary education.
- The two main factors influencing the level of teachers' salary costs are teachers' salaries and theoretical class sizes. Between 2005 and 2017, teachers' salaries increased in most OECD countries, and this additional cost was often offset by similar increases in the average class size.

Figure C7.1. Annual salary cost of teachers per student in public institutions, by level of education (2017)

USD converted using PPPs for private consumption



1. Teachers' statutory salaries after 10 years of experience instead of 15 years.
2. Teachers' statutory salaries at the start of their career instead of after 15 years of experience.

Countries and economies are ranked in descending order of the annual salary cost of teachers per student in lower secondary education.

Source: OECD (2019), Table C7.1. See *Source* section for more information and Annex 3 for notes (https://doi.org/10.1787/f8d7880d-en).

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Context

Governments have become increasingly interested in the relationship between the amount of resources devoted to education and student learning outcomes. They seek to provide more and better education for their population, while ensuring that public funding is used efficiently, particularly when public budgets are tight. Teachers' compensation usually accounts for the largest share of expenditure on education and thus of expenditure per student. The salary cost of teachers per student, as calculated in this indicator, is a function of students' instruction time, teachers' teaching time, teachers' statutory salaries and theoretical class sizes (see *Methodology* section).

Differences among countries in these factors may explain differences in the level of expenditure per student. Similarly, a given level of expenditure may be associated with different combinations of these factors. This indicator examines the choices countries make when investing their resources in primary and secondary education and explores how different policy choices related to these factors affect the salary cost of teachers.

The salary cost of teachers per student can be affected by other variables not directly assessed in this indicator, such as demographic changes. For example, in countries where enrolments have been declining in recent years, class sizes would also shrink (assuming all other factors remain constant), unless there was also a simultaneous drop in the number of teachers. This indicator does not distinguish between a reduction in class size due to demographic changes and a deliberate policy decision to reduce class size.

Other findings

- Similar levels of expenditure among countries can mask a variety of contrasting policy choices. For example, France and Hungary have nearly the same salary cost of teachers per primary student, but teachers' statutory salaries in France are 80% higher than in Hungary, which is more than balanced out by classes in France having about seven more students on average (based on the theoretical class size).
- On average across OECD countries, the salary cost of teachers per student represents 6.7% of gross domestic product (GDP) per capita at primary level and 8.2% at lower secondary level.
- Given a fixed level of salary cost, a reduction in class size can be compensated for by a decrease in teachers' salaries, a decrease in instruction time or an increase in teaching time. For example, in Australia, in order to reduce theoretical class size by one student and keep the salary cost per student constant, annual teacher salaries would have to fall by USD 3 600, annual instruction time would have to be reduced by 57 hours, or annual teaching time would have to increase by 53 hours

Note

The salary cost of teachers per student is estimated based on values for teachers' gross statutory salaries after 15 years of experience and the most prevalent qualifications (see Indicator D3), the theoretical instruction time for students (see Indicator D1) and teachers' statutory teaching time (see Indicator D4). This measure may differ from the actual salary cost of teachers (see Box C7.1).

The use of statutory salaries means that this indicator does not take into account the actual level of qualifications and the seniority of the teaching workforce. The statutory salary also does not include employer's contribution to social security and pension and therefore does not represent the full cost incurred by the employer (i.e. the government). As a result, this measure is not comparable to the indicator on expenditure on teacher compensation (see Indicator B6).

Analysis

Variation in the salary cost of teachers per student by level of education

On average across OECD countries and economies, the salary cost of teachers is USD 2 784 per primary student, USD 3 380 per lower secondary student and USD 3 274 per general upper secondary student (Figure C7.1). Each of these averages masks a wide range of salary costs across countries. For example, in primary education, the salary cost of teachers per student in Germany (USD 4 679) is over six times the cost in Latvia (USD 720). Higher salary costs are a result of higher teachers' salaries and/or having more teachers per student, which is itself pushed up by smaller classes, longer required instruction time for students or shorter teaching hours for teachers.

The general increase in teachers' salary cost between primary and lower secondary education is the result of increases in teachers' salaries and students' instruction time, as well as a reduction in teaching time, all of which push up the cost. In 2017, the OECD average annual statutory salary for teachers with 15 years of experience was USD 43 007 at lower secondary level, around USD 1 950 more than the average salary at primary level. Moreover, the average annual instruction time in lower secondary education was 124 hours longer than in primary education, while average teaching time was 83 hours shorter, implying that more teachers were needed to teach a given number of pupils.

In contrast to the other factors, theoretical class size tends to increase between primary and lower secondary education, which partially offsets the increase in cost between the two levels (the OECD average theoretical class size increases from 15 students at primary level to 17 students at lower secondary). However, in general, the effect of the larger class size is not enough to offset the increase in cost caused by the other three factors. Chile, Colombia and Mexico are the only OECD countries where the salary cost of teachers per student in lower secondary is less than in primary education (Tables C7.5a and b, available on line). This is mainly due to an increase in theoretical class size between primary and lower secondary levels in these countries.

In a few countries, the learning environment and the organisation of schools are relatively similar in primary and lower secondary education. For example, in 2017, the difference in the salary cost of teachers per student between primary and lower secondary was less than USD 100 in Canada, Hungary, Mexico and Turkey. The greatest difference was in Slovenia, where it was of USD 4 036.

Variation in the salary cost of teachers per student after accounting for countries' wealth

The level of the salary cost of teachers per student is positively correlated with countries' GDP per capita, so it is important to also take into account relative wealth when comparing countries. On average across OECD countries, the salary cost of teachers per student represents 6.7% of GDP per capita at primary level, 8.2% at lower secondary level and 8.0% in general programmes at upper secondary level (Table C7.1).

The ranking of a few countries changes once GDP per capita is taken into account. For example, Poland's salary cost of teachers per student in primary education is below the OECD average, at USD 2 355. However, this amount represents 7.9% of the country's GDP per capita, above the OECD average of 6.7%. This means that Poland devotes an above-average share of its GDP per capita to teachers' salary cost, even if the absolute amount is relatively low. The opposite is the case in Ireland, where the salary cost of teachers per student in primary education (USD 3 844) is considerably above the OECD average, but represents only 5% of the country's GDP per capita, well below the OECD average.

Box C7.1. Methodological limitations and potential future developments

Teachers' salary cost per student, as presented in this indicator, is an estimated measure of how much is spent on teachers' salaries in each country. In addition to teachers' salaries themselves, the indicator takes into account three factors that influence the number of teachers a system requires: the number of required instruction hours, the number of hours teachers spend teaching and the theoretical class size. Please see the *Methodology* section for more information on how these factors relate to each other and are combined to calculate the salary cost.

It is important to consider the limitations of this indicator's methodology when interpreting the results. First, the indicator is calculated using the statutory values for teaching and instruction time and teachers' statutory salaries. Therefore, the results presented in this indicator are theoretical in nature, and do not reflect the actual time teachers spend teaching or how much they actually earn each year. Indeed, even the concept of teaching and instruction time have become increasingly theoretical in nature as learning settings become more flexible, making it difficult to accurately measure the amount of time spent on these activities.

Second, by using national figures, the indicator misses the wide discrepancies that may exist within countries. The trade-off between teachers' salaries and class size, for example, may have very different effects depending on the socio-economic status of students and schools. Moreover, the trade-offs highlighted in this analysis are only a few of the many decisions countries must make when allocating their resources. Countries must also examine potential trade-offs with other investment areas, such as teacher training and school infrastructure, as well as trade-offs between different levels of education.

Although some of these limitations are difficult to address due to current data availability, there are several possible avenues to take that would expand the analytical potential of this indicator once more data become available. The first would be improving the measure used to estimate the cost of teachers. One way to achieve this might be to use teachers' average actual salaries, taking bonuses and allowances into account, instead of the statutory salaries. Another possibility would be to take into account the full cost to the government of teachers' salaries, including costs that do not go directly to teachers, such as employer's contributions and pensions.

Other avenues for potential future development include exploring the link between teachers' salary costs and school funding formulae, and how the trade-offs associated with teachers' salary costs may differ across subnational levels of decision making, such as schools, school districts and municipalities.

Contribution of each factor to the salary cost of teachers per student

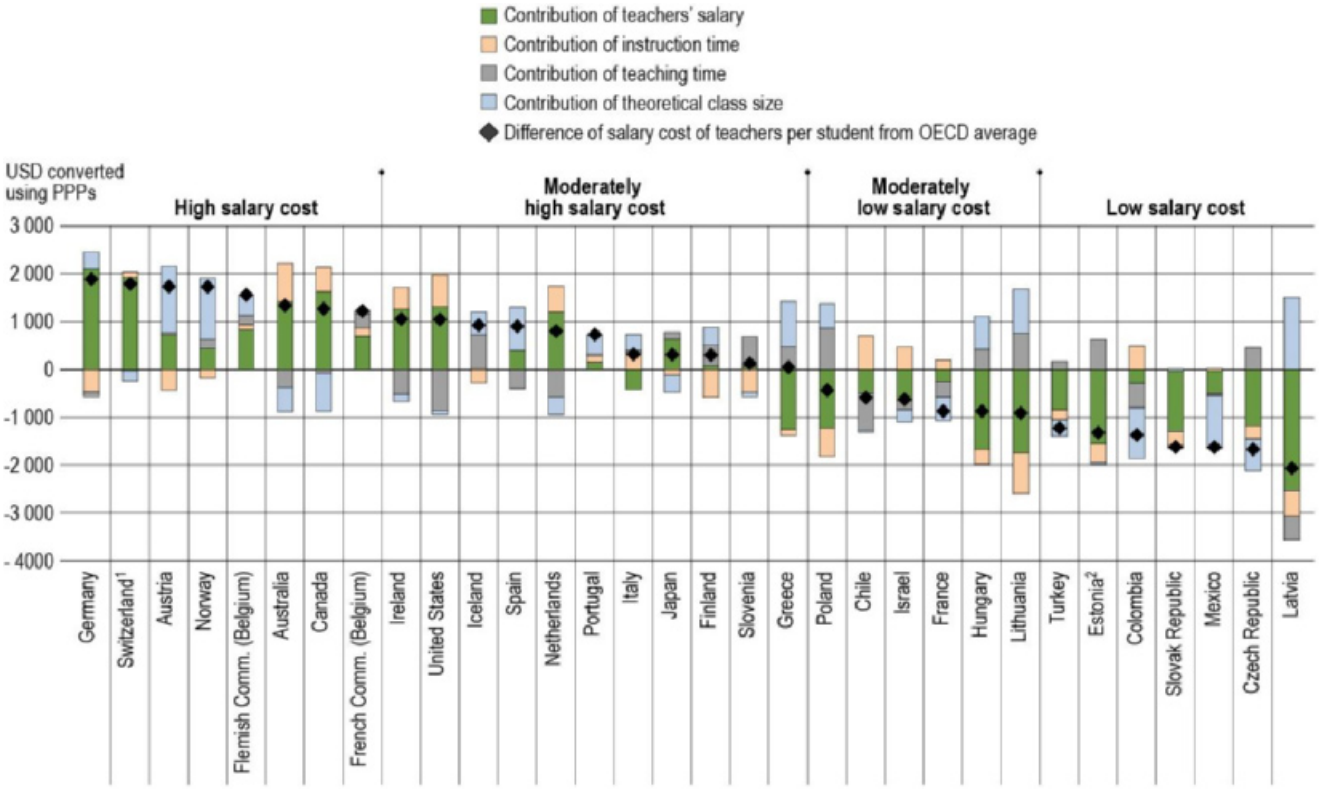
The four factors which determine the salary cost of teachers per student affect it in different ways. The impact of the first factor, teachers' salaries, is direct: higher salaries lead to higher salary costs. The other three factors affect the salary cost by changing the number of teachers needed, assuming that the number of students enrolled is constant. If instruction time increases or teaching time decreases, more teachers must be hired to keep class sizes constant. Similarly, more teachers would need to be hired in order to reduce class sizes while keeping everything else constant.

By comparing a country's salary cost to the OECD average, it is possible to determine the contribution of each of the four factors to the difference from the average. In other words, it is possible to assess whether a given salary cost is above average because of higher salaries, longer instruction times, shorter teaching hours, smaller class sizes or a combination of these four factors. Changing one of these factors may require compensatory trade-offs among the other factors in order to keep the total salary cost constant (Box C7.2).

Figure C7.2 shows the wide variety of combinations of the four factors across countries and their different effects on the salary cost of teachers. The size of the contribution of each factor to the difference between a country's salary cost and the OECD average depends on the difference between the factor itself and the respective OECD average. The sum of each factor's contribution equals the difference in salary cost between that country and the OECD average. For example, the salary cost per student in primary education in Poland is USD 2 355, USD 429 lower than the OECD average. This difference is the result of the contributory effects of the four factors: below-average theoretical class size adds USD 521 to the difference, below-average teaching time adds USD 864, below-average teachers' salary subtracts USD 1 226 and below-average instruction time subtracts USD 588 (Table C7.2).

Figure C7.2. Contribution of various factors to salary cost of teachers per student in public institutions, primary education (2017)

USD converted using PPPs for private consumption



How to read this chart: This figure shows the contribution (in USD) of the factors influencing the difference between salary cost of teachers per student in the country and the OECD average. For example, in Poland, the salary cost of teachers per student is USD 429 lower than the OECD average. Poland has a smaller theoretical class size (+ USD 521) and less teaching time (+ USD 864) than the OECD average, both of which push the salary cost of teachers up. However, this is more than compensated for by below-average teachers' salaries (- USD 1 226) and below-average instruction time (- USD 588), which push the cost down.

1. Teachers' statutory salaries after 10 years of experience instead of 15 years.
2. Teachers' statutory salaries at the start of their career instead of after 15 years of experience.

Countries and economies are ranked in descending order of the difference between the salary cost of teachers per student and the OECD average.

Source: OECD (2019), Table C7.2. See *Source* section for more information and Annex 3 for notes (https://doi.org/10.1787/f8d7880d-en).

StatLink https://doi.org/10.1787/888933979538

Different policies in countries with similar spending

Higher levels of expenditure on education cannot automatically be equated with better performance by education systems (OECD, 2016[1]). In addition to the fact that structural changes cannot guarantee better learning outcomes, countries spending similar amounts on education do not necessarily have similar education policies and practices. The OECD countries and economies shown in Figure C7.2 can be divided into four groups, each with similar teachers' salary cost per student, in order to better illustrate the range of policy choices that are possible – and have been made by other countries – while spending similar amounts.

Group 1: High salary cost of teachers per student in primary education

This group, which has the highest salary cost of teachers per student in primary education, is composed of Australia, Austria, the Flemish and French communities of Belgium, Canada, Germany, Norway and Switzerland. The salary cost of teachers per student in this group ranges from USD 4 013 to USD 4 679. All of these countries have above-average GDP per capita, but the relationship between salary cost and GDP per capita is not one-to-one. Some countries allocate a larger share of their wealth to this type of expenditure than others (Table C7.1).

Compared to countries from the other groups, it may seem as though these high-spending countries do not face trade-offs between the four factors analysed in this indicator. Indeed, most of the countries in this group can afford both above-average teacher salaries *and* below-average theoretical class sizes. However, the magnitude of the difference between these factors and the respective OECD averages differs considerably across these countries. In Germany, for example, the high salary cost of teachers is mostly a result of high teachers' salaries, whereas in Austria it is mostly the result of small theoretical class sizes.

Group 2: Moderately high salary cost of teachers per student in primary education

This group is composed of 11 countries with above-average salary costs: Finland, Greece, Iceland, Ireland, Italy, Japan, the Netherlands, Portugal, Slovenia, Spain and the United States. The salary cost of teachers per student in this group ranges from USD 2 833 to USD 3 844 (Table C7.1). This group is highly heterogeneous in terms of GDP per capita and education expenditure, which sheds light on the many different choices countries with similar spending can make.

A potential trade-off observed in some countries is between students' required instruction time and teachers' teaching time. In the Netherlands, for example, students receive 147 hours more instruction time per year than the OECD average, but this is almost entirely offset by teaching time that is 150 hours longer than the average. Requiring longer teaching hours, which limits the number of teachers that need to be hired, can also be used to compensate for higher teachers' salaries. This is the case in the United States, where the requirement for 224 teaching hours above the OECD average helps offset for the additional USD 19 970 teachers receive each year (the statutory teachers' salary in the United States is USD 61 028 compared to the OECD average of USD 41 058).

Group 3: Moderately low salary cost of teachers per student in primary education

This group is composed of six countries with below-average salary cost of teachers per student: Chile, France, Hungary, Israel, Lithuania and Poland. Teachers' salary cost in this group range from USD 1 875 per student to USD 2 355 (Table C7.1). With the exception of France, all of these countries have below-average GDP per capita.

All six countries in this group have below-average teacher salaries, which is one of the main drivers of the below-average salary cost in primary education. However, there are considerable differences between them. In Hungary, Lithuania and Poland, lower teachers' salaries are partially compensated by shorter teaching hours and smaller theoretical class sizes. This is not the case in the other three countries, where teaching time and theoretical class sizes are both above average. France and Hungary have nearly the same salary cost of teachers

per student, but teachers' statutory salaries in France are 80% higher than in Hungary, which is more than compensated for by having about seven more students per class (based on the theoretical class size).

Group 4: Low salary cost of teachers per student in primary education

This group is composed of the seven countries with the lowest salary cost of teachers per student in primary education: Colombia, the Czech Republic, Estonia, Latvia, Mexico, the Slovak Republic and Turkey. The salary cost of teachers per student in this group ranges from USD 720 to USD 1 560 (Table C7.1). These countries all have below-average GDP per capita.

In an overall cross-country comparison, Latvia and the Slovak Republic might be bundled together as having low salary costs due to below-average salaries and below-average theoretical class sizes. However, there are important differences in the education characteristics of these two countries. The Slovak Republic's larger theoretical class size (compared to Latvia's) allows it to pay teachers over twice as much as Latvia, which has the lowest teachers' salaries and smallest theoretical class sizes of all OECD countries.

Evolution of average class size and teachers' salaries

At each level of education, teachers' salaries generally have the greatest impact on the degree to which countries' salary cost of teachers per student diverges from the OECD average. The second most influential factor is the theoretical class size. The trade-off between these two variables, which are often the target of educational reforms and policies, reflects the choice countries have to make between increasing teachers' salaries and hiring more teachers. In fact, controlling for the total salary cost of teachers, countries with higher teachers' salaries tend to have larger class sizes (OECD, 2018[2]).

Figure C7.3 plots the evolution of teachers' statutory salaries and average class sizes between 2005 and 2017. The average class size, unlike the theoretical class size discussed in the previous sections of this indicator, refers to the average actual class size obtained by dividing the number of students enrolled by the number of classes in each country (please see the *Definitions* section for more information on the difference between theoretical and average class size).

The figure groups countries into four different categories, each represented in a quadrant of the chart. Countries in the top-right and bottom-left quadrants exhibit a trade-off between average class size and teachers' salaries in this period. Countries in the top-right quadrant increased average class sizes (which brings the salary cost of teachers down) and increased teachers' salaries (which pushes the cost up). The most notable example among this group of countries is Mexico, where the average class size increased by over 20% in the period, helping to offset the cost of increasing teachers' salaries by over 30%. Only two countries (Greece and Japan) faced the opposite trade-off, where average class sizes were reduced, but the additional cost was somewhat compensated for by lower teachers' salaries. It is important to note that although these changes have opposite effects on the salary cost, they are not necessarily taken in response to each other. In Japan, for example, the decrease in average class size was mainly due to a demographic change whereas the decrease in teachers' salaries was at least partially due to a change in teachers' generation.

No particular trade-off between these two variables seems to have taken place in this period in the countries and economies in the top-left and bottom-right quadrants. Those in the top-left quadrant increased average class sizes and reduced teachers' salaries over this period, both measures that push down the salary cost of teachers. In some countries and economies, the cost was mostly pushed down by larger average class sizes – in Portugal, for example, average class size increased by 17% in this period – and in others the cost was mostly pushed down by lower teachers' salaries – in England (United Kingdom), teachers' salaries decreased by 10%.

The opposite trend is found in countries in the bottom-right quadrant, which reduced average class sizes and increased teachers' salaries, both measures that increase the salary cost of teachers. Once again, the size of the change in each variable differs across countries. Between 2005 and 2017, teachers' salaries increased by nearly 40% in Luxembourg, while average class sizes fell by nearly 30% in Korea.

It is interesting to observe countries that had a similar evolution in one of the factors, but followed a very different path for the other. For example, between 2005 and 2017, both Austria and Hungary increased teachers' salaries by about 9%. However, during the same period, Hungary also increased average class sizes by 10%, thus offsetting some of the additional cost of higher salaries, while Austria reduced average class sizes by about 8%, thus increasing the salary cost of teachers even more.

Smaller class sizes are often seen as beneficial, but the evidence regarding their impact on student learning is mixed. Results from the latest Programme for International Student Assessment (PISA) show that students in larger classes have higher scores in science on average across OECD countries (OECD, 2016[3]). Other research has found that smaller class sizes may be beneficial in some cases, such as for students from disadvantaged backgrounds who may need more individualised attention (Dynarski, Hyman and Schanzenbach, 2013[4]). Given that reducing class size is a costly measure (Box C7.2), it is important to compare its impact with other possible interventions (OECD, 2016[1]).

Box C7.2. What might be the trade-offs of decreasing class size by one student?

This indicator assesses the impact of four factors (teachers' salaries, instruction time, teaching time and theoretical class size) on countries' salary cost of teachers per student and the trade-offs that can exist between them. This analysis can be used to answer the following question: assuming that the number of students and the salary cost remain constant, what are the potential trade-offs among the other factors which would compensate for a smaller class size? More specifically, by how much would salaries or instruction time have to fall, or teaching time have to increase, in order to maintain the same salary cost?

Table C7.a presents the simulation results for decreasing the theoretical class size by one student. For each factor, the value is calculated keeping everything else constant. For example, in primary education in Australia, in order to reduce the theoretical class size by one student and keep the salary cost per student constant, teachers' salaries would have to fall by USD 3 600, annual instruction time would have to fall by 57 hours, or annual teaching time would have to increase by 53 hours. Any one of these trade-offs would compensate for the additional cost of the smaller class size, without any change to the total salary cost of teachers per student.

These results emphasise the fact that reducing class sizes, by as little as one student, comes with a price tag. Indeed, class sizes have been decreasing in several OECD countries over recent years (see Indicator D2), although often as a result of demographic changes rather than of active policy choices. Class sizes tend to fall when student enrolment falls because of the political, economic and organisational challenges of simultaneously reducing the number of teachers. However, in the long term, not reducing the teaching workforce is in itself a policy choice that will keep classes smaller. Table C7.a shows that the price of smaller class sizes can either be reflected in higher salary costs, or it can be offset by changes to the other three factors.

It is important to assess the results presented in Table C7.a by taking into account the current values of each factor in the country. For example, Chile already has the longest teaching hours of all OECD countries, so further increases to compensate for smaller class size may not be feasible or desirable.

This simulation is not meant to assess the real cost of reforms. The simple model only takes into account four factors, and it only shows the trade-off for one factor at a time. In reality, trade-offs will often consist of changes in several factors at the same time. Moreover, important regional variations, not captured by this indicator, may require specific policies that would not necessarily be reflected in the national averages. Rather, this analysis is only meant to highlight the importance of trade-offs in policy decisions, and to provide some guidance as to the direction and size of the potential trade-offs across the four factors assessed in this indicator.

Table C7.a. Keeping salary cost constant, what might be the trade-offs of decreasing class size by one student? (2017)

Trade-offs of decreasing theoretical class size in primary education, public institutions only

OECD countries and economies	Teachers' statutory salaries (in equivalent USD per year)	Instruction time (in hours per year)	Teaching time (in hours per year)
Australia	-3 600	-57	53
Austria	-5 000	-69	85
Flemish Comm. (Belgium)	-3 900	-62	60
French Comm. (Belgium)	-3 400	-57	52
Canada	-3 500	-49	45
Chile	-2 200	-69	75
Colombia	-1 400	-40	41
Czech Republic	-1 000	-32	30
Estonia[1]	-1 300	-44	42
Finland	-3 200	-49	55
France	-2 000	-47	51
Germany	-5 300	-51	63
Greece	-2 500	-70	67
Hungary	-1 800	-61	63
Iceland	-3 200	-56	52
Ireland	-3 800	-58	62
Israel	-1 900	-58	54
Italy	-2 700	-67	62
Japan	-3 000	-45	47
Latvia	-1 200	-83	165
Lithuania	-1 900	-54	62
Mexico	-1 200	-29	31
Netherlands	-3 600	-56	59
Norway	-4 400	-72	78
Poland	-2 100	-52	50
Portugal	-3 300	-63	64
Slovak Republic	-1 400	-45	57
Slovenia	-2 700	-43	43
Spain	-4 100	-70	85
Switzerland[2]	-4 400	-51	53
Turkey	-1 600	-41	43
United States	-4 000	-63	70

Note: Results for teachers' statutory salaries are rounded to the nearest hundred. Teachers' salaries used in the calculation of this indicator refer to the annual statutory teachers' salaries in public institutions for teachers with 15 years of experience and the most prevalent qualification (Indicator D3). Instruction time refers to the average number of hours per year of compulsory instruction time (Indicator D1) and teaching time refers to the statutory net teaching hours over the school year (Indicator D4). The reference year for these factors may differ by one year for some countries. See Table C7.5a, available on line, for notes on each factor.

1. Teachers' statutory salaries at the start of their career instead of after 15 years of experience.
2. Teachers' statutory salaries after 10 years of experience instead of 15 years.

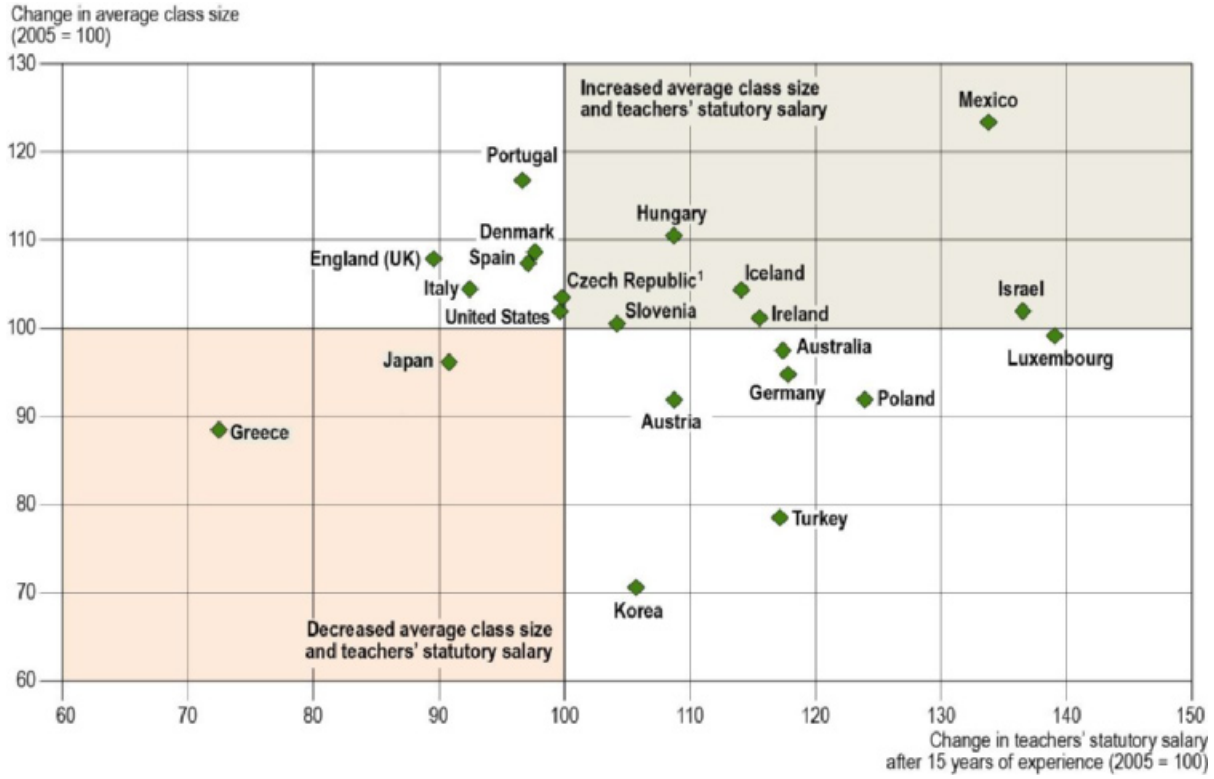
Source: OECD (2019), Table C7.5a, available on line. See *Source* section for more information and Annex 3 for notes (https://doi.org/10.1787/f8d7880d-en).

StatLink https://doi.org/10.1787/888933979576

As observed in Figure C7.3, one alternative measure is to increase teacher salaries. Evidence from PISA points to the importance of high-quality teaching in improving student outcomes (OECD, 2016[1]) and one way to help school systems attract the best candidates to the teaching profession is by offering higher salaries. However, attracting good candidates to the teaching profession and retaining the effective ones is not just a matter of raising salaries. Other factors include the quality of training before and after entering the profession and the relationship between teachers and society.

Figure C7.3. Index of change in teachers' salaries and in average class size in primary education between 2005 and 2017

Public institutions only



Note: The source for the average class size is the UOE CLASS questionnaire. The average class size does not correspond to the theoretical class size (please see *Definitions* section).
1. Teachers' statutory salaries based on minimum qualifications instead of typical qualifications.
Source: OECD (2019), Education at a Glance database, http://stats.oecd.org. See *Source* section for more information and Annex 3 for notes (https://doi.org/10.1787/f8d7880d-en).

StatLink https://doi.org/10.1787/888933979557

Definitions

Average class size refers to number of students enrolled in a given education level divided by the number of classes. It measures the average number of students that are grouped together in classrooms (see Indicator D2).

Instruction time refers to the time a public school is expected to provide instruction to students on all the subjects integrated into the compulsory and non-compulsory curriculum, on school premises or in before or after-school activities that are formal parts of the compulsory programme (see Indicator D1).

Teachers' teaching time is the annual average number of hours that full-time teachers teach a group or class of students including all extra hours, such as overtime (see Indicator D4).

Teachers' salary refers to the annual statutory salary of teachers after 15 years of experience, converted to USD using purchasing power parity (PPP) for private consumption (see Indicator D3).

Theoretical class size refers to the theoretical size of classes given the statutory – or theoretical – values of instruction and teaching time and the student teacher ratio (see *Methodology* section). It does not reflect the actual average class size in countries.

Methodology

The salary cost of teachers per student (SCS) is calculated as:

$$SCS = Teacher\ salary * Instruction\ time * \frac{1}{Teaching\ time} * \frac{1}{Theoretical\ Class\ Size}$$

Where theoretical class size is calculated as:

$$Theoretical\ class\ size = \frac{Instruction\ time}{Teaching\ time} * \frac{Students}{Teachers}$$

The contribution of each factor to the level of the salary cost of teachers per student is analysed by comparing the salary cost of teachers per student in each country to the OECD average and then calculating the contribution of these different factors to the variation from the OECD average. This exercise is based on a mathematical relationship between the various factors and follows the method presented in the Canadian publication *Education Statistics Bulletin* (Quebec Ministry of Education, Recreation and Sports, 2003[5]). Using this mathematical relationship and comparing a country's values for the four factors to the OECD averages makes it possible to measure both the direct and indirect contribution of each of these four factors to the variation in salary cost per student between that country and the OECD average.

Please see the *OECD Handbook for Internationally Comparative Education Statistics 2018* (OECD, 2018[6]) for more information and Annex 3 for country-specific notes (http://dx.doi.org/10.1787/eag-2018-36-en).

Source

Data referring to the 2017 school year are based on the UOE data collection on education statistics and on the Survey on Teachers and the Curriculum, which were both administered by the OECD in 2018.

Note regarding data from Israel

The statistical data for Israel are supplied by and are under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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Indicator C7 Tables

Table C7.1 Salary cost of teachers per student, by level of education (2017)

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Cut-off date for the data: 19 July 2019. Any updates on data can be found on line at http://dx.doi.org/10.1787/eag-data-en. More breakdowns can also be found at http://stats.oecd.org/, Education at a Glance database.

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Table C7.1. Salary cost of teachers per student, by level of education (2017)

Annual salary cost of teachers per student in public institutions, in equivalent USD, converted using PPPs for private consumption, and in percentage of GDP per capita

		Salary cost of teachers per student (in USD, 2017 constant prices)			Salary cost of teachers per student (in percentage of GDP per capita)		
		Primary	Lower secondary	Upper secondary, general programmes	Primary	Lower secondary	Upper secondary, general programmes
		(1)	(2)	(3)	(4)	(5)	(6)
OECD	**Countries**						
	Australia	4 127	5 008	m	7.9	9.6	m
	Austria	4 525	6 299	5 635	8.4	11.7	10.4
	Canada	4 057	4 057	5 092	8.6	8.6	10.9
	Chile	2 198	2 048	1 841	9.0	8.4	7.6
	Colombia	1 416	1 274	1 384	9.7	8.7	9.5
	Czech Republic	1 117	1 779	m	2.9	4.7	m
	Denmark	m	m	m	m	m	m
	Estonia[1]	1 463	1 930	m	4.4	5.8	m
	Finland	3 087	5 112	m	6.7	11.0	m
	France	1 915	2 843	2 993	4.3	6.4	6.8
	Germany	4 679	6 008	m	8.9	11.4	m
	Greece	2 833	3 376	m	9.9	11.8	m
	Hungary	1 915	2 000	1 990	6.7	7.0	6.9
	Iceland	3 714	4 010	m	6.6	7.1	m
	Ireland	3 844	4 532	4 532	5.0	5.9	5.9
	Israel	2 165	3 095	3 307	5.5	7.9	8.4
	Italy	3 103	3 546	3 616	7.6	8.7	8.8
	Japan	3 096	3 798	m	7.4	9.1	m
	Korea	q	q	m	q	q	m
	Latvia	720	1 044	m	2.8	4.1	m
	Lithuania	1 875	2 738	m	5.7	8.3	m
	Luxembourg	m	m	m	m	m	m
	Mexico	1 159	1 061	1 743	5.8	5.4	8.8
	Netherlands	3 590	4 650	4 531	6.6	8.5	8.3
	New Zealand	m	m	m	m	m	m
	Norway	4 518	4 909	m	8.6	9.3	m
	Poland	2 355	2 699	m	7.9	9.0	m
	Portugal	3 518	4 641	4 831	10.8	14.3	14.9
	Slovak Republic	1 164	1 627	1 406	3.6	5.0	4.3
	Slovenia	2 911	6 948	m	8.1	19.2	m
	Spain	3 691	4 912	4 787	9.4	12.6	12.2
	Sweden	m	m	m	m	m	m
	Switzerland[2]	4 579	6 818	m	6.9	10.2	m
	Turkey	1 560	1 605	1 830	5.5	5.7	6.5
	United States	3 834	3 940	3 880	6.4	6.6	6.5
	Economies						
	Flemish Comm. (Belgium)	4 349	5 699	6 920	8.8	11.5	14.0
	French Comm. (Belgium)	4 013	5 775	6 200	8.1	11.7	12.5
	England (UK)	m	m	m	m	m	m
	Scotland (UK)	m	m	m	m	m	m
	OECD average[3]	2 784	3 380	3 274	6.7	8.2	8.0

Note: Teachers' salaries used in the calculation of this indicator refer to the annual statutory teachers' salaries in public institutions for teachers with 15 years of experience and the most prevalent qualification (Indicator D3). Instruction time refers to the average number of hours per year of compulsory instruction time (Indicator D1) and teaching time refers to the statutory net teaching hours over the school year (Indicator D4). The reference year for these factors may differ by one year for some countries. See Tables C7.5a, b and c, available on line, for notes on each factor.

1. Teachers' statutory salaries at the start of their career instead of after 15 years of experience.
2. Teachers' statutory salaries after 10 years of experience instead of 15 years.
3. The OECD average only includes countries and economies with data for all factors used to calculate salary cost.

Source: OECD (2019). See *Source* section for more information and Annex 3 for notes (https://doi.org/10.1787/f8d7880d-en).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.

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Table C7.2. Contribution of various factors to salary cost of teachers per student in primary education (2017)

In equivalent USD, converted using PPPs for private consumption

		Salary cost of teachers per student (2017)	Difference (in USD) from the 2017 OECD average of USD 2 784	Contribution of the underlying factors to the difference from the OECD average			
				Effect (in USD) of teachers' salary below/above the 2017 OECD average of USD 41 058	Effect (in USD) of instruction time (for students) below/ above the 2017 OECD average of 793 hours	Effect (in USD) of teaching time (for teachers) below/ above the 2017 OECD average of 780 hours	Effect (in USD) of theoretical class size below/above the 2017 OECD average of 15 students per class
		(1)	(2) = (3) + (4) + (5) + (6)	(3)	(4)	(5)	(6)
OECD	**Countries**						
	Australia	4 127	1 343	1 423	804	- 363	- 521
	Austria	4 525	1 741	767	- 429	2	1 401
	Canada	4 057	1 273	1 633	515	- 79	- 797
	Chile	2 198	- 586	- 491	704	- 778	- 21
	Colombia	1 416	-1 368	- 285	493	- 513	-1 063
	Czech Republic	1 117	-1 668	-1 176	- 272	457	- 677
	Denmark	m	m	m	m	m	m
	Estonia[1]	1 463	-1 321	-1 550	- 391	633	- 13
	Finland	3 087	303	79	- 583	434	374
	France	1 915	- 869	- 250	202	- 334	- 488
	Germany	4 679	1 895	2 110	- 464	- 98	346
	Greece	2 833	49	-1 253	- 128	482	948
	Hungary	1 915	- 869	-1 667	- 315	428	685
	Iceland	3 714	930	8	- 274	721	474
	Ireland	3 844	1 060	1 262	460	- 517	- 145
	Israel	2 165	- 619	- 646	479	- 194	- 258
	Italy	3 103	319	- 415	345	55	334
	Japan	3 096	312	634	- 114	147	- 355
	Korea	q	q	q	q	q	q
	Latvia	720	-2 064	-2 541	- 526	- 505	1 509
	Lithuania	1 875	- 909	-1 743	- 853	756	931
	Luxembourg	m	m	m	m	m	m
	Mexico	1 159	-1 625	- 499	18	- 49	-1 095
	Netherlands	3 590	806	1 202	549	- 570	- 375
	New Zealand	m	m	m	m	m	m
	Norway	4 518	1 734	445	- 185	185	1 289
	Poland	2 355	- 429	-1 226	- 588	864	521
	Portugal	3 518	733	158	160	6	410
	Slovak Republic	1 164	-1 620	-1 296	- 302	- 34	13
	Slovenia	2 911	127	65	- 468	625	- 94
	Spain	3 691	907	396	- 3	- 393	907
	Sweden	m	m	m	m	m	m
	Switzerland[2]	4 579	1 795	1 931	106	- 23	- 220
	Turkey	1 560	-1 225	- 844	- 205	172	- 348
	United States	3 834	1 050	1 315	677	- 854	- 87
	Economies						
	Flemish Comm. (Belgium)	4 349	1 565	838	106	190	431
	French Comm. (Belgium)	4 013	1 229	694	177	288	70
	England (UK)	m	m	m	m	m	m
	Scotland (UK)	m	m	m	m	m	m

Note: Teachers' salaries used in the calculation of this indicator refer to the annual statutory teachers' salaries in public institutions for teachers with 15 years of experience and the most prevalent qualification (Indicator D3). Instruction time refers to the average number of hours per year of compulsory instruction time (Indicator D1) and teaching time refers to the statutory net teaching hours over the school year (Indicator D4). The reference year for these factors may differ by one year for some countries. See Table C7.5a, available on line, for notes on each factor.

1. Teachers' statutory salaries at the start of their career instead of after 15 years of experience.

2. Teachers' statutory salaries after 10 years of experience instead of 15 years.

Source: OECD (2019). See *Source* section for more information and Annex 3 for notes (https://doi.org/10.1787/f8d7880d-en).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.

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Table C7.3. Contribution of various factors to salary cost of teachers per student in lower secondary education (2017)

In equivalent USD, converted using PPPs for private consumption

		Salary cost of teachers per student (2017)	Difference (in USD) from the 2017 OECD average of USD 3 380	Contribution of the underlying factors to the difference from the OECD average			
				Effect (in USD) of teachers' salary below/above the 2017 OECD average of USD 43 007	Effect (in USD) of instruction time (for students) below/ above the 2017 OECD average of 916 hours	Effect (in USD) of teaching time (for teachers) below/ above the 2017 OECD average of 696 hours	Effect (in USD) of theoretical class size below/above the 2017 OECD average of 17 students per class
		(1)	(2) = (3) + (4) + (5) + (6)	(3)	(4)	(5)	(6)
OECD	**Countries**						
	Australia	5 008	1 628	1 524	367	- 570	308
	Austria	6 299	2 919	1 014	- 85	651	1 339
	Canada	4 057	677	1 621	33	- 253	- 724
	Chile	2 048	-1 331	- 650	422	-1 130	27
	Colombia	1 274	-2 106	- 418	636	- 531	-1 793
	Czech Republic	1 779	-1 601	-1 720	- 82	316	- 114
	Denmark	m	m	m	m	m	m
	Estonia[1]	1 930	-1 450	-2 085	- 294	401	528
	Finland	5 112	1 732	242	- 537	706	1 321
	France	2 843	- 537	- 349	100	56	- 344
	Germany	6 008	2 628	2 805	1	- 334	157
	Greece	3 376	- 4	-1 694	- 538	474	1 754
	Hungary	2 000	-1 380	-1 999	- 356	170	805
	Iceland	4 010	630	- 162	- 328	407	713
	Ireland	4 532	1 152	1 360	10	- 141	- 76
	Israel	3 095	- 285	- 681	235	- 11	172
	Italy	3 546	166	- 351	269	368	- 120
	Japan	3 798	418	608	- 91	478	- 576
	Korea	q	q	q	q	q	q
	Latvia	1 044	-2 336	-3 418	- 351	- 76	1 509
	Lithuania	2 738	- 642	-2 529	- 775	432	2 229
	Luxembourg	m	m	m	m	m	m
	Mexico	1 061	-2 319	- 138	539	- 857	-1 863
	Netherlands	4 650	1 270	2 250	359	- 305	-1 034
	New Zealand	m	m	m	m	m	m
	Norway	4 909	1 529	317	- 195	202	1 205
	Poland	2 699	- 681	-1 588	- 385	1 188	103
	Portugal	4 641	1 261	16	- 108	489	865
	Slovak Republic	1 627	-1 753	-1 801	- 266	166	149
	Slovenia	6 948	3 568	- 125	- 949	548	4 094
	Spain	4 912	1 533	758	573	- 96	297
	Sweden	m	m	m	m	m	m
	Switzerland[2]	6 818	3 438	3 035	254	- 363	513
	Turkey	1 605	-1 775	-1 089	- 208	825	-1 303
	United States	3 940	560	1 421	400	-1 228	- 32
	Economies						
	Flemish Comm. (Belgium)	5 699	2 319	858	121	251	1 089
	French Comm. (Belgium)	5 775	2 395	719	185	263	1 228
	England (UK)	m	m	m	m	m	m
	Scotland (UK)	m	m	m	m	m	m

Note: Teachers' salaries used in the calculation of this indicator refer to the annual statutory teachers' salaries in public institutions for teachers with 15 years of experience and the most prevalent qualification (Indicator D3). Instruction time refers to the average number of hours per year of compulsory instruction time (Indicator D1) and teaching time refers to the statutory net teaching hours over the school year (Indicator D4). The reference year for these factors may differ by one year for some countries. See Table C7.5b, available on line, for notes on each factor.

1. Teachers' statutory salaries at the start of their career instead of after 15 years of experience.
2. Teachers' statutory salaries after 10 years of experience instead of 15 years.

Source: OECD (2019). See *Source* section for more information and Annex 3 for notes (https://doi.org/10.1787/f8d7880d-en).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.

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