2

Viewing Education in the United States Through the Prism of PISA

This chapter examines the United States' performance in PISA compared with high-performing and rapidly improving education systems and other international benchmarks. This serves as the backdrop for the examination of other education systems in Chapters 3 through 9, which look at the trajectories of education policies and practices in the benchmark systems. The concluding chapter of this report then draws some possible lessons for the United States from both the comparative data and the education policies of the countries portrayed in this report.

Since the focus of the PISA 2009 assessment was on reading, results on reading are examined in greater detail than results in mathematics and science. Unless noted otherwise, references to tables and figures refer to OECD's *PISA 2009 Results*.

LEARNING OUTCOMES

Mean performance of United States' 15-year-olds in the middle of the rankings

On the 2009 PISA assessment of 15-year-olds, the United States performs around the average in reading (rank 14[1]) and science (rank 17[2]) and below the average in mathematics (rank 25[3]) among the 34 OECD countries (Table 2.1). Figures 2.16, 2.17 and 2.18 at the end of this chapter show the relative standing of the United States compared to the benchmark countries examined in the subsequent chapters and other OECD countries.

Table 2.1 United States' mean scores on reading, mathematics and science scales in PISA

	PISA 2000	PISA 2003	PISA 2006	PISA 2009
	Mean score	Mean score	Mean score	Mean score
Reading	504	495		500
Mathematics		483	474	487
Science			489	502

Source: OECD (2010), *PISA 2009 Results: What Students Know and Can Do: Student Performance in Reading, Mathematics and Science (Volume I)*, OECD Publishing.
StatLink http://dx.doi.org/10.1787/888932366636

There is, of course, significant performance variability within the United States, including between individual states. Unlike other federal nations, the United States did not measure the performance of states individually on PISA. However, it is possible to compare the performance of public schools among groups of states. Such a comparison suggests that in reading, public schools in the northeast of the United States would perform at 510 PISA score points – 17 score points above the OECD average (comparable with the performance of the Netherlands) but still well below the high-performing education systems examined in this volume – followed by the midwest with 500 score points (comparable with the performance of Poland), the west with 486 score points (comparable with the performance of Italy) and the south with 483 score points (comparable with the performance of Greece). Note, however, that because of the way in which the sample was drawn, the performance estimates for the groups of states are associated with considerable error.

Performance varies even more between schools and social contexts. For example, despite the fact that the relationship between socio-economic background and learning outcomes is stronger in the United States than in the high-performing systems examined in this volume, over 20% of American 15-year-olds enrolled in socio-economically disadvantaged schools reach the average performance standards of Finland, one of the best-performing education systems.[4]

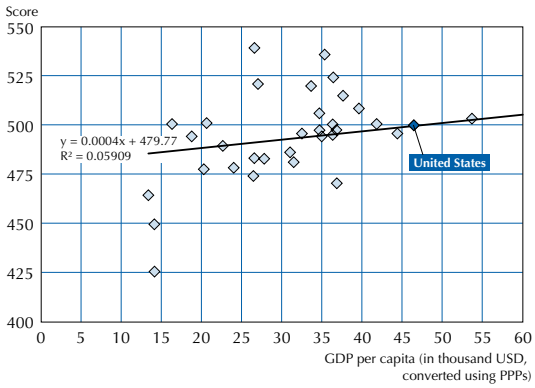
The United States has seen significant performance gains in science since 2006, which were mainly driven by improvements at the bottom of the performance distribution (visible in higher performance at the 10th and 25th percentiles) while performance remained unchanged at the top end of the performance distribution. Student performance in reading and mathematics has remained broadly unchanged since 2000 and 2003, respectively, when PISA began to measure these trends.

Average performance needs to be seen against a range of socio-economic background indicators, most of which give the United States a significant advantage compared with other industrialised countries (Box 2.1 and Table I.2.20 in *PISA 2009 Results Volume I*).

Box 2.1 A context for interpreting the performance of countries

■ Figure 2.1a ■

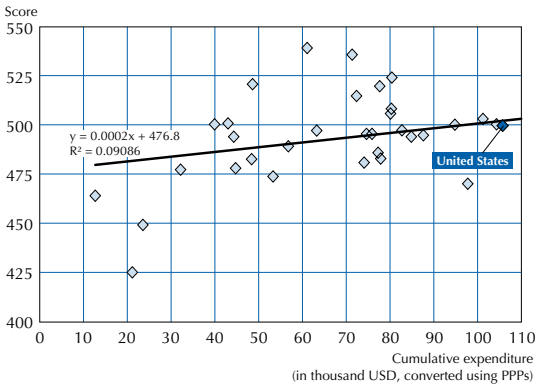
Reading performance and GDP



Source: OECD (2010), *PISA 2009 Results, Volume I*, Table I.2.20.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.1b ■

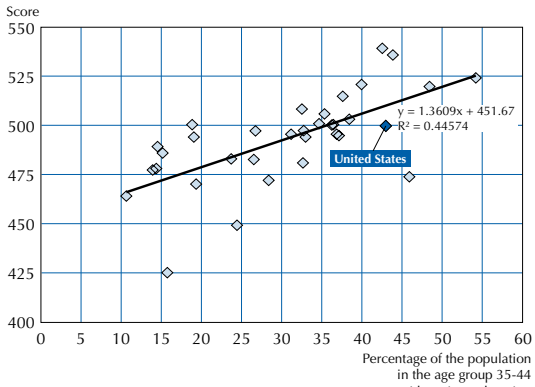
Reading performance and spending on education



Source: OECD (2010), *PISA 2009 Results, Volume I*, Table I.2.20.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.1c ■

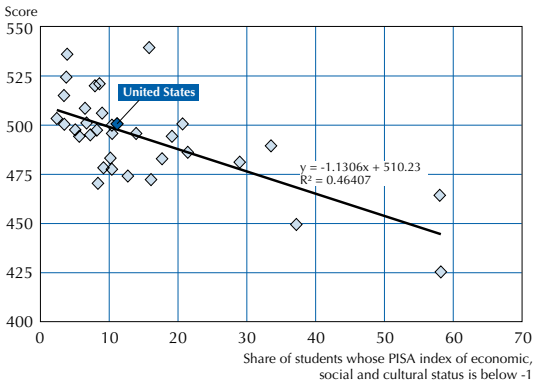
Reading performance and parents' education



Source: OECD (2010), *PISA 2009 Results, Volume I*, Table I.2.20.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.1d ■

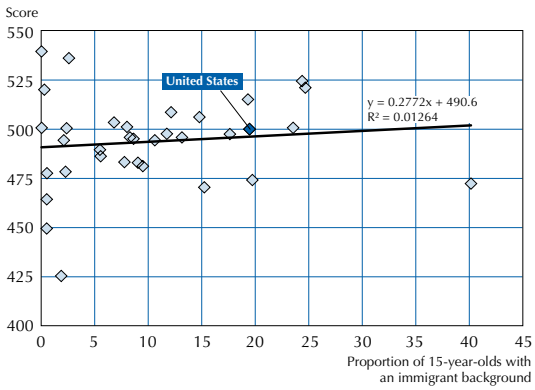
Reading performance and share of socio-economically disadvantaged students



Source: OECD (2010), *PISA 2009 Results, Volume I*, Table I.2.20.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.1e ■

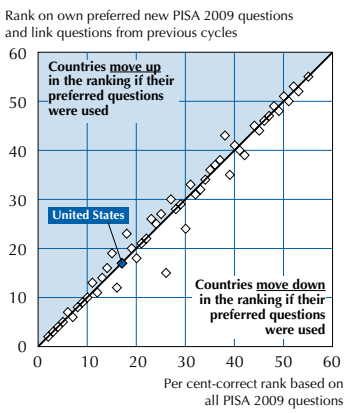
Reading performance and proportion of students from an immigrant background



Source: OECD (2010), *PISA 2009 Results, Volume I*, Table I.2.20.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.1f ■

Equivalence of the PISA test across cultures and languages



Source: OECD (2010), *PISA 2009 Results, Volume I*, Table I.2.21.
StatLink http://dx.doi.org/10.1787/888932366636

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The wealth of the United States means it can spend more on education. As shown in Volume II of *PISA 2009 Results, Overcoming Social Background,* the wealth of families influences the educational performance of their children. Similarly, the relative prosperity of some countries allows them to spend more on education, while other countries find themselves constrained by a lower national income. In fact, the relationship suggests that 6% of the variation between OECD countries' mean scores can be predicted on the basis of their GDP per capita. The United States, which ranks 3rd after Luxembourg and Norway in terms of GDP per capita, has a substantial economic advantage over other OECD countries because of the amount of money it has available to spend on education (Table I.1.20 in *PISA 2009 Results Volume I*).

Only Luxembourg spends more per student. While GDP per capita reflects the potential resources available for education in each country, it does not directly measure the financial resources actually invested in education. However, a comparison of countries' actual spending per student, from the age of 6 up to 15, on average, puts the United States at an even greater advantage, since only Luxembourg spends more than the United States on school education per student, on average. Across OECD countries, expenditure per student explains 9% of the variation in PISA mean performance between countries. Deviations from the trend line suggest that moderate spending per student cannot automatically be equated with poor performance by education systems. For example, Estonia and Poland, which spend around USD 40 000 per student, perform at the same level as Norway and the United States, which spend over USD 100 000 per student.[5] Similarly, New Zealand, one of the highest-performing countries in reading, spends well below the average per student (Table I.1.20 in *PISA 2009 Results Volume I*).

It is not just the volume of resources that matters but also how countries invest these, and how well they succeed in ***directing the money where it can make the most difference***. The United States is one of only three OECD countries in which, for example, socio-economically disadvantaged schools have to cope with less favourable student-teacher ratios than socio-economically advantaged schools, which implies that students from disadvantaged backgrounds may end up with considerably lower spending per student than what the above figures on average spending would suggest. With respect to spending on instruction, the United States spends a far lower proportion than the average OECD country on the salaries of high-school teachers.

At the same time, high school teachers in the United States teach far more hours, which reduces costs, but smaller class sizes are driving costs upwards (Table B7.3 in the 2010 edition of OECD's *Education at a Glance*). By contrast, Japan or Korea pay their teachers comparatively well and provide them with ample time for other work than teaching, which drives costs upwards, while paying for this with comparatively large class sizes. Finland puts emphasis on non-salary aspects of the working conditions of high-school teachers and also pays for the costs with comparatively large class sizes. Finally, the OECD indicators also show that the United States spends 11.6% of its resources for schools on capital outlays, a figure that is higher only in the Netherlands, Norway and Luxembourg (OECD average 7.6%) (Table B6.2b in the 2010 edition of OECD's *Education at a Glance*).

Parents in the United States are better educated than in most other countries. Given the close interrelationship between a student's performance and his or her parents' level of education observed in Volume II of *PISA 2009 Results,* it is also important to bear in mind the educational attainment of adult populations when comparing the performance of OECD countries, since countries with more highly educated adults are at an advantage over countries in which parents have less education. A comparison of the percentage of 35-to-44-year-olds that have attained upper secondary or tertiary levels of education, which roughly corresponds to the age group of parents of the 15-year-olds assessed in PISA, ranks the United States 8th among the 34 OECD countries (Table A1.2 in the in the 2010 edition of OECD's *Education at a Glance*).

The share of students from disadvantaged backgrounds in the United States is about average. Socio-economic disadvantage and heterogeneity in student populations pose other challenges for teachers and education systems. As shown in Volume II of *PISA 2009 Results,* teachers instructing socio-economically disadvantaged children are likely to face greater challenges than teachers with students from more privileged socio-economic backgrounds.

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A comparison of the socio-economic background of the most disadvantaged quarter of students puts the United States around the OECD average while the socio-economic background of the student population as a whole ranks clearly above the OECD average.[6] In other words, while the overall socio-economic context of students in the United States is above that of a typical OECD country, the proportion of students from disadvantaged backgrounds is similar in the United States to that of OECD countries in general. The greater socio-economic variability in the United States thus does not result from a disproportional share of students from poor families, but rather from an above-average share of students from socio-economically advantaged backgrounds.

Among OECD countries the United States has the 6th largest proportion of students with an immigrant background. Integrating students with an immigrant background is part of the socio-economic challenge, and the performance levels of students who immigrated to the country in which they were assessed in PISA can only be partially attributed to the education system of their host country. With 19.5%, the United States has the 6th highest share of students with an immigrant background among OECD countries. However, the share of students with an immigrant background explains just 3% of the performance variation between countries. Among the 8 OECD countries that have between 15% and 30% of students with an immigrant background, which includes the United States, four show a smaller performance gap for immigrants on PISA while three show a larger performance gap for immigrants than the United States (Figure II.4.3 in *PISA 2009 Results, Volume II*).

The data in Figure 2.1 show that countries vary in their demographic, social and economic contexts. These differences need to be taken into account when interpreting differences in student performance. At the same time, the future economic and social prospects of both individuals and countries depends on the results they actually achieve, not on the performance they might have achieved under different social and economic conditions. That is why the results that are actually achieved by students, schools and countries are the focus of the subsequent analysis in this chapter.

Even after accounting for the demographic, economic and social contexts of education systems, the question remains: to what extent is an international test meaningful when differences in languages and cultures lead to very different ways in which subjects such as language, mathematics or science are taught and learned across countries? It is inevitable that not all tasks on the PISA assessments are equally appropriate in different cultural contexts and equally relevant in different curricular and instructional contexts. To gauge this, PISA asked every country to identify those tasks from the PISA tests that it considered most appropriate for an international test. Countries were advised to give an on-balance rating for each task with regard to its relevance to "preparedness for life", authenticity and interest for 15-year-olds. Tasks given a high rating by each country are referred to as that country's most preferred questions for PISA. PISA then scored every country on its own most preferred questions and compared the resulting performance with the performance on the entire set of PISA tasks. For the United States, its relative standing remains the same, irrespective of whether all PISA items or the items "preferred" by the United States are used as a basis for comparisons.

Relative shares of students "at risk"

Eighteen per cent of 15-year-olds in the United States do not reach the PISA baseline Level 2 of reading proficiency, a percentage that is around the OECD average and that has remained unchanged since 2000. Excluding students with an immigrant background reduces the percentage of poorly performing students slightly to 16%. By contrast, in Shanghai-China, Hong Kong-China, Canada, Finland and Korea, the proportion of poor performers is 10% or less (Figure I.2.14 in *PISA 2009 Results Volume I*).

Level 2 on the PISA reading scale can be considered a baseline level of proficiency, at which students begin to demonstrate the reading competencies that will enable them to participate effectively and productively in life. Students proficient at Level 2 are capable of very basic tasks, such as locating information that meets several conditions, making comparisons or contrasts around a single feature, working out what a well-defined part of a text means even when the information is not prominent, and making connections between the text and personal experience. Some tasks at this level require students to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low-level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require students to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.

■ Figure 2.2 ■

Summary descriptions for the seven levels of proficiency in reading

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (OECD average)	Characteristics of tasks
6	698	0.8% of students across the OECD can perform tasks at Level 6 on the reading scale	Tasks at this level typically require the reader to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the reader to deal with unfamiliar ideas, in the presence of prominent competing information, and to generate abstract categories for interpretations. *Reflect and evaluate* tasks may require the reader to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understandings from beyond the text. A salient condition for *access and retrieve* tasks at this level is precision of analysis and fine attention to detail that is inconspicuous in the texts.
5	626	7.6% of students across the OECD can perform tasks at least at Level 5 on the reading scale	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis, drawing on specialised knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
4	553	28.3% of students across the OECD can perform tasks at least at Level 4 on the reading scale	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesise about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
3	480	57.2% of students across the OECD can perform tasks at least at Level 3 on the reading scale	Tasks at this level require the reader to locate, and in some cases recognise the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorising. Often the required information is not prominent or there is much competing information; or there are other obstacles in the text, such as ideas that are contrary to expectation or negatively worded. Reflective tasks at this level may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.
2	407	81.2% of students across the OECD can perform tasks at least at Level 2 on the reading scale	Some tasks at this level require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.
1a	335	94.3% of students across the OECD can perform tasks at least at Level 1a on the reading scale	Tasks at this level require the reader: to locate one or more independent pieces of explicitly stated information; to recognise the main theme or author's purpose in a text about a familiar topic; or to make a simple connection between information in the text and common, everyday knowledge. Typically the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.
1b	262	98.9% of students across the OECD can perform tasks at least at Level 1b on the reading scale	Tasks at this level require the reader to locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. The text typically provides support to the reader, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation the reader may need to make simple connections between adjacent pieces of information.

A follow-up of students who were assessed by PISA in 2000 as part of the Canadian Youth in Transitions Survey shows that students scoring below Level 2 face a disproportionately higher risk of poor post-secondary participation or low labour-market outcomes at age 19, and even more so at age 21, the latest age for which data are currently available. For example, the odds of Canadian students who had reached PISA Level 5 in reading at age 15 to achieve a successful transition to post-secondary education by age 21 were 20 times higher than for those who had not achieved the baseline Level 2, even after adjustments for socio-economic differences are made (OECD, 2010e).[7] Similarly, of the Canadian students who performed below Level 2 in 2000, over 60% had not gone on to any post-school education by the age of 21; by contrast, more than half of the students (55%) who had performed at Level 2 as their highest level were at college or university.

In mathematics, the proportion of students below Level 2 on the PISA mathematics scale is 23.4% (OECD average of 20.8%) and remained similar to the percentage in 2003 (25.7%) (Table V.3.2 in *PISA 2009 Results Volume V*). Students proficient at Level 2 in mathematics can employ basic algorithms, formulae, procedures or conventions. They can interpret and recognise mathematical situations in contexts that require no more than direct inference and extract relevant information from a single source and make use of a single representational mode. They are capable of direct reasoning and making literal interpretations of the results.

In science, the proportion of students below Level 2 on the PISA science scale is, at 18.1%, around the OECD average but has declined from 24.4% in 2006 (Table V.3.4 in *PISA 2009 Results Volume V*). To reach Level 2 requires competencies such as identifying key features of a scientific investigation, recalling single scientific concepts and information relating to a situation, and using results of a scientific experiment represented in a data table as they support a personal decision. In contrast, students who do not reach Level 2 in science often confuse key features of an investigation, apply incorrect scientific information, and mix personal beliefs with scientific facts in support of a decision.

Relative shares of top-performing students

At the other end of the performance scale, students in the United States do comparatively well at the very highest levels of reading proficiency (Levels 5 and 6), have an average share of top performers in science, but a below-average share of top performers in mathematics (Figures I.2.14, I.3.9 and I.3.20 in *PISA 2009 Results Volume I*).

Students proficient at Level 6 on the PISA reading scale are capable of conducting fine-grained analysis of texts, which requires detailed comprehension of both explicit information and unstated implications; and capable of reflecting on and evaluating what they read at a more general level. They can overcome preconceptions in the face of new information, even when that information is contrary to expectations. They are capable of recognising what is provided in a text, both conspicuously and more subtly, while at the same time being able to apply a critical perspective to it, drawing on sophisticated understandings from beyond the text. This combination of a capacity to absorb the new and to evaluate it is greatly valued in knowledge economies, which depend on innovation and nuanced decision making that draw on all the available evidence. At 1.5%, the United States has a significantly higher share of the highest-performing readers than the average (0.8%). However, in Australia, Canada, Finland, Japan, New Zealand, Singapore or Shanghai-China, the corresponding percentages are even higher, ranging from 1.8 to 2.9%.

At the next highest level, Level 5 on the PISA reading literacy scale, students can still handle texts that are unfamiliar in either form or content. They can find information in such texts, demonstrate detailed understanding, and infer which information is relevant to the task. Using such texts, they are also able to evaluate critically and build hypotheses, draw on specialised knowledge and accommodate concepts that may be contrary to expectations. The United States has, at 10%, an above-average share of students who perform at Level 5 or above (average 8%). However, in Shanghai-China (19.5%), New Zealand and Singapore (15.7%), Finland (14.5%) and Japan (13.4%) the corresponding percentages are higher.

Only 2% of students in the United States reach the highest level of performance in mathematics, compared with an OECD average of 3%, and figures ranging up to 27% in Shanghai-China (Table I.3.1 in *PISA 2009 Results Volume I*). Students proficient at Level 6 on the mathematics scale are capable of advanced mathematical thinking and reasoning. These students can apply insight and understanding, along with a mastery of symbolic and formal mathematical operations and relationships, to develop new approaches and strategies for addressing novel situations. They can formulate and accurately communicate their actions and reflections regarding their findings, interpretations, arguments and the appropriateness of these to the given situations. At the next highest level, Level 5 on the PISA mathematics scale, students can still develop and work with models in complex situations, identifying constraints and specifying assumptions.

They can select, compare and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriate linked representations, symbolic and formal characterisations, and insight pertaining to these situations. Ten per cent of students in the United States reach the PISA mathematics Level 5, compared with 13% on average across OECD countries. In Shanghai-China, half of the students reach Level 5, in Singapore and Hong Kong-China over 30% do, and in Chinese Taipei, Korea, Switzerland, Finland, Japan and Belgium over 20% do.

Students proficient at Level 6 in science can consistently identify, explain and apply scientific knowledge and knowledge about science in a variety of complex life situations. They can link different information sources and explanations and use evidence from those sources to justify decisions. They clearly and consistently demonstrate advanced scientific thinking and reasoning, and they use their scientific understanding to solve unfamiliar scientific and technological situations. Students at this level can use scientific knowledge and develop arguments in support of recommendations and decisions that centre on personal, social or global situations. One per cent of students in the United States reach Level 6 in science, which corresponds to the OECD average. In Singapore, the percentage is 4.6%, in Shanghai-China 3.9%, in New Zealand 3.6%, in Finland 3.3% and in Australia 3%.

Students proficient at the PISA science Level 5 can identify the scientific components of many complex life situations, apply both scientific concepts and knowledge about science to these situations, and can compare, select and evaluate appropriate scientific evidence for responding to life situations. Students at this level can use well-developed inquiry abilities, link knowledge appropriately and bring critical insights to situations. They can construct explanations based on evidence and arguments that emerge from their critical analysis. Nine per cent of students in the United States reach this level, which again corresponds to the OECD average. In Shanghai-China, 24.3% of students do, in Singapore 19.9%, in Finland 18.7%, in New Zealand 17.6% and in Japan, Hong Kong-China, Australia, Germany, the Netherlands and Canada, between 12.1% and 16.6% of students reach this level.

EQUITY IN THE DISTRIBUTION OF LEARNING OPPORTUNITIES

PISA explores equity in education from three perspectives: first, it examines differences in the distribution of learning outcomes of students and schools; second, it studies the extent to which students and schools of different socio-economic backgrounds have access to similar educational resources, both in terms of quantity and quality; and third, it looks at the impact of students' family background and school location on learning outcomes. The first perspective was discussed in the preceding section; the last two are discussed below.

Equity in access to resources

A first potential source of inequities in learning opportunities lies in the distribution of resources across students and schools. In a school system characterised by an equitable distribution of educational resources, the quality or quantity of school resources would not be related to a school's average socio-economic background, as all schools would enjoy similar resources. Therefore, if there is a positive relationship between the socio-economic background of students and schools and the quantity or quality of resources, this signals that more advantaged schools enjoy more or better resources. A negative relationship implies that more or better resources are devoted to disadvantaged schools. No relationship implies that resources are distributed similarly among schools attended by socio-economically advantaged and disadvantaged students.

In around half of OECD countries, the student-teacher ratio relates positively to the socio-economic background of schools – in other words, disadvantaged schools tend to have more teachers per student. This positive relationship is particularly pronounced in Belgium, Denmark, Estonia, Germany, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, Portugal and Spain. This important measure of resource allocation indicates that these countries use the student-teacher ratio to moderate disadvantage. Among OECD countries, only Israel, Slovenia, Turkey and the United States favour socio-economically advantaged schools with access to more teachers (Figure 2.3). The financing of schools in the United States, which is dependent on local taxation and thus closely related to housing costs, may contribute to concentrations of disadvantaged pupils in poorly resourced schools.

In the majority of OECD countries, including the United States, more advantaged students also enjoy a higher proportion of better-qualified full-time teachers. The picture is similar when examining schools whose principals report that the lack of qualified teachers hinders learning. All of this suggests that ensuring an equitable distribution of resources is still a major challenge for the United States, but also for other countries, if not in terms of the quantity of resources, then in terms of their quality. Figure 2.3 compares the Unites States with the benchmark countries examined in subsequent chapters as well as with other OECD countries.

■ Figure 2.3 ■

Relationship between school average socio-economic background and school resources

Disadvantaged schools are more likely to have more or better resources, in **bold** if relationship is statistically different from the OECD average

Advantaged schools are more likely to have more or better resources, in **bold** if relationship is statistically different from the OECD average

Within country correlation is not statistically significant

		Simple correlation between the school mean socio-economic background and:					
		Percentage of full-time teachers	Percentage of certified teachers among all full-time teachers	Percentage of teachers with university-level (ISCED 5A) among all full-time teachers	Index of quality of school's educational resources	Computer/student ratio	Student/teacher ratio[1]
OECD	Australia	**-0.21**	**-0.05**	0.02	**0.31**	0.01	-0.07
	Austria	-0.13	**0.21**	**0.64**	0.03	-0.05	-0.07
	Belgium	**-0.18**	0.05	**0.58**	0.02	**-0.23**	**0.66**
	Canada	0.01	**0.14**	0.03	0.18	-0.05	0.09
	Chile	-0.04	-0.01	**0.25**	**0.35**	**0.32**	-0.05
	Czech Republic	**-0.32**	**0.29**	**0.37**	0.00	0.15	0.08
	Denmark	0.01	-0.17	0.16	0.04	-0.08	**0.27**
	Estonia	0.14	0.00	0.00	0.10	-0.09	**0.43**
	Finland	**0.17**	-0.01	-0.01	0.13	-0.01	0.08
	France	c	c	c	c	c	c
	Germany	-0.15	-0.02	-0.02	0.06	-0.18	**0.28**
	Greece	-0.11	0.06	0.24	0.16	-0.12	0.25
	Hungary	**-0.33**	0.07	0.07	0.11	**-0.20**	0.02
	Iceland	**0.20**	**0.39**	**0.30**	**0.06**	**-0.41**	**0.40**
	Ireland	0.12	-0.10	-0.08	0.16	-0.03	**0.49**
	Israel	-0.08	-0.06	0.20	0.25	0.08	**-0.20**
	Italy	-0.06	**0.16**	0.13	0.15	**-0.19**	**0.50**
	Japan	-0.14	0.04	0.20	0.17	**-0.34**	**0.38**
	Korea	-0.14	0.00	-0.03	-0.04	**-0.53**	0.30
	Luxembourg	**-0.16**	**-0.01**	**0.39**	0.13	**-0.13**	**0.28**
	Mexico	-0.09	**-0.13**	-0.04	**0.59**	**0.14**	0.03
	Netherlands	**-0.34**	**-0.12**	**0.62**	0.06	-0.16	**0.38**
	New Zealand	-0.04	0.08	0.07	0.16	-0.02	0.11
	Norway	-0.05	0.04	0.15	0.14	-0.02	0.19
	Poland	-0.02	0.03	-0.05	0.06	-0.16	0.01
	Portugal	**0.14**	-0.05	0.04	0.24	-0.02	**0.39**
	Slovak Republic	-0.09	**0.28**	**-0.21**	-0.05	-0.06	0.00
	Slovenia	**0.46**	**0.32**	**0.55**	0.13	**-0.21**	**-0.25**
	Spain	**-0.29**	c	c	0.10	**-0.16**	**0.45**
	Sweden	0.05	0.01	-0.04	0.26	**0.13**	0.12
	Switzerland	-0.11	-0.07	0.24	0.10	0.03	0.06
	Turkey	0.12	-0.04	0.04	0.04	-0.06	**-0.26**
	United Kingdom	**-0.36**	0.05	-0.03	0.00	0.01	-0.10
	United States	**-0.42**	-0.24	0.10	0.22	0.06	**-0.17**
	OECD average	-0.07	0.04	0.15	0.13	-0.08	0.15
Partners	Albania	**-0.25**	0.00	**0.38**	**0.44**	**0.24**	0.15
	Argentina	0.13	0.13	0.22	**0.51**	**0.21**	-0.02
	Azerbaijan	0.05	-0.06	**0.44**	0.19	0.17	0.23
	Brazil	-0.03	0.10	0.03	**0.52**	**0.25**	**-0.20**
	Bulgaria	-0.08	0.17	0.17	0.09	-0.17	0.21
	Colombia	**-0.24**	**-0.16**	-0.08	**0.53**	**0.19**	-0.14
	Croatia	0.09	0.02	**0.28**	0.09	0.17	0.32
	Dubai (UAE)	**0.32**	**0.61**	**-0.01**	**0.34**	**0.47**	**-0.27**
	Hong Kong-China	-0.19	-0.06	0.12	0.06	0.04	0.02
	Indonesia	**0.24**	**0.27**	0.16	**0.44**	0.14	**-0.16**
	Jordan	-0.04	0.00	-0.02	0.26	0.05	0.06
	Kazakhstan	**0.23**	0.04	**0.34**	0.21	-0.12	**0.44**
	Kyrgyzstan	**0.17**	0.08	**0.35**	0.27	**0.13**	0.27
	Latvia	**0.19**	-0.03	0.19	0.14	0.00	**0.38**
	Liechtenstein	**-0.15**	0.02	**0.57**	**-0.91**	**0.79**	**0.70**
	Lithuania	**0.21**	0.09	0.19	-0.02	**-0.49**	0.21
	Macao-China	**0.11**	**0.05**	**-0.18**	**0.26**	**0.22**	**0.17**
	Montenegro	0.07	**0.32**	**0.38**	-0.11	-0.19	**0.33**
	Panama	**-0.51**	**-0.47**	-0.13	**0.68**	**0.38**	0.03
	Peru	-0.21	0.08	**0.48**	**0.53**	**0.46**	-0.02
	Qatar	**0.03**	**-0.04**	**-0.07**	**0.23**	**0.19**	**0.11**
	Romania	0.05	0.10	0.11	0.20	-0.07	-0.02
	Russian Federation	**0.18**	0.08	0.31	**0.26**	0.02	**0.29**
	Serbia	0.10	0.06	0.06	-0.01	0.00	0.11
	Shanghai-China	**0.14**	0.13	**0.32**	0.16	-0.10	**-0.13**
	Singapore	-0.13	0.00	**0.22**	**0.10**	**-0.18**	**-0.14**
	Chinese Taipei	0.12	**0.34**	0.29	0.19	-0.04	-0.07
	Thailand	0.07	0.06	0.16	**0.39**	0.00	-0.02
	Trinidad and Tobago	**-0.19**	**0.09**	**0.56**	0.12	**0.08**	**0.38**
	Tunisia	-0.06	0.00	0.20	0.13	0.15	-0.02
	Uruguay	-0.01	**0.27**	0.08	**0.33**	**0.30**	0.13

1. In contrast to the other columns, negative correlations indicate more favourable characteristics for advantaged students.

Source: OECD, *PISA 2009 Database*, Table II.2.2.

StatLink http://dx.doi.org/10.1787/888932366636

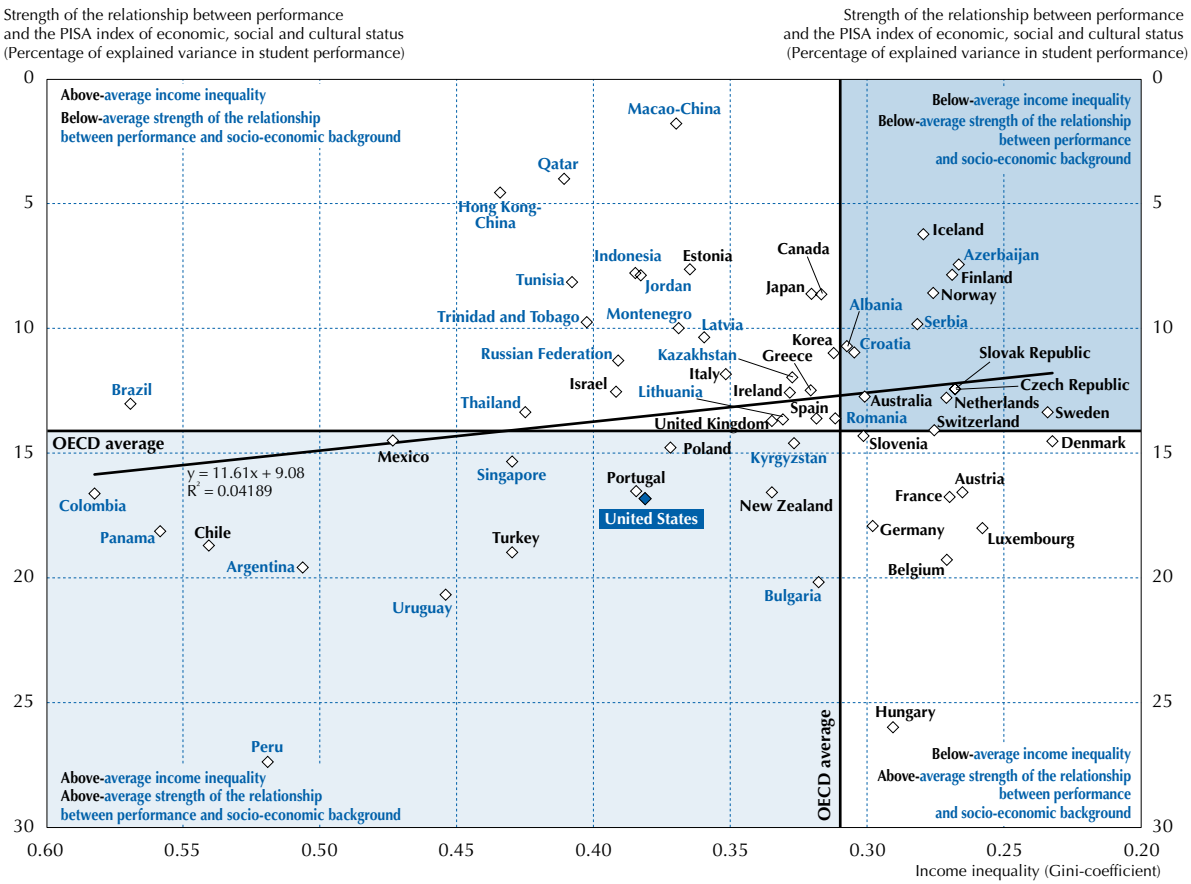
Moderating the impact of socio-economic background on learning outcomes

Students who did not surpass the most basic performance level on PISA were not a random group and the results show that socio-economic disadvantage has a particularly strong impact on student performance in the United States: 17% of the variation in student performance in the United States is explained by students' socio-economic background. This contrasts with just 9% in Canada or Japan, two of the benchmark countries described later in this volume. In other words, in the United States, two students from a different socio-economic background vary much more in their learning outcomes than is normally the case in OECD countries. Among OECD countries, only Hungary, Belgium, Turkey, Luxembourg, Chile and Germany show a larger impact of socio-economic background on reading performance than the United States. It is important to emphasise that these countries, including the United States, do not necessarily have a more disadvantaged socio-economic student intake than other countries; but socio-economic differences among students translate into a particularly strong impact on student learning outcomes (Figure 2.4).

Similarly, among the 25 countries participating in PISA that show a more unequal distribution of income in their populations than the United States (among OECD countries, these include only Chile, Israel, Mexico, Portugal and Turkey) only Panama, Chile, Peru, Argentina, Uruguay and Turkey show a larger impact of socio-economic background on learning outcomes at school (Figure 2.4). The comparatively close relationship between the learning outcomes of students in the United States and socio-economic background is therefore not simply explained by a more socio-economically heterogeneous student population or society but, as noted before, mainly because socio-economic disadvantage translates more directly into poor educational performance in the United States than is the case in many other countries.

■ Figure 2.4 ■

Income inequality in the population and strength of the relationship between socio-economic background and performance



Note: The Gini coefficient measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. The Gini index measures the area between the Lorenz curve and the hypothetical line of absolute equality, expressed as a proportion of the maximum area under the line. A Gini index of zero represents perfect equality and 1, perfect inequality.

Source: OECD, *PISA 2009 Database*, Table II.1.1.

StatLink http://dx.doi.org/10.1787/888932366636

If social inequities in societies were always closely linked to the impact of social disadvantage on learning outcomes, the role for public policy to improve equity in the distribution of learning opportunities would be limited, at least in the short term. However, there is almost no relationship between income inequalities in countries and the impact of socio-economic background on learning outcomes (Figure 2.4), that is, some countries succeed, even under difficult conditions, to moderate the impact of socio-economic background on educational success.

Also in the United States, the relationship between socio-economic background and learning outcomes is far from deterministic (Figure 2.5). For example, some of the most socio-economically disadvantaged schools match the performance of schools in Finland.[8] Furthermore, as noted before, a quarter of American 15-year-olds enrolled in socio-economically disadvantaged schools reach the average performance standards of Finland, one of the best-performing education systems.[9]

It is useful to examine four of the aspects of socio-economic background and their relationship to student performance in greater detail.

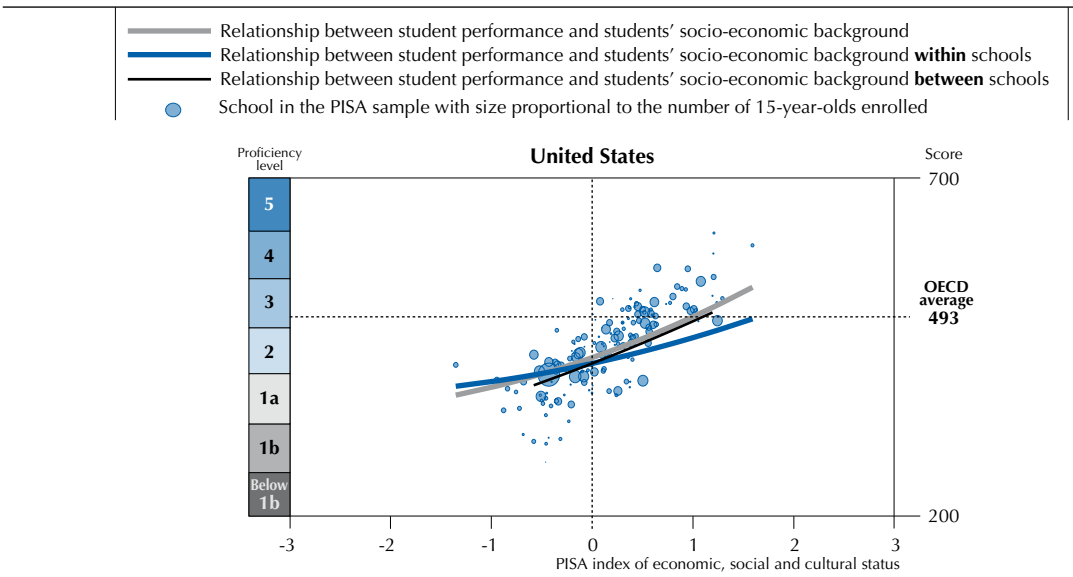
Community size: While students in the United States in large cities (students attending schools located in cities with over one million inhabitants) perform at 485 score points on the PISA reading scale, below the OECD average of 493 score points, suburban schools perform, on average, just slightly higher than the OECD average. The performance challenges for the United States therefore do not just relate to poor students in poor neighbourhoods, but to many students in many neighbourhoods.[10]

Family composition: While results from PISA show that single-parent families are more prevalent in the United States than on average across OECD countries (24% of 15-year-olds in the United States come from a single-parent family compared with an average of 17%), they also show that 15-year-olds in the United States from single-parent families face a much higher risk of low performance than is the case across OECD countries (Table II.2.5 in *PISA 2009 Results Volume II*).

Immigrant students: Thirty per cent of schools in the United States have more than a quarter of students with an immigrant background. Among OECD countries, only Luxembourg, Switzerland, Australia, New Zealand, Canada and Israel show a higher concentration of students with an immigrant background in schools (the OECD average is 14%). Twelve per cent of students in the United States are enrolled in schools in which the share of immigrant students even exceeds 50%, a percentage that only Luxembourg, Canada and New Zealand exceed (Table II.4.6 in *PISA 2009 Results Volume II*). What PISA data also show is that students in the United States with an immigrant background tend to attend schools with a socio-economically more disadvantaged background, that have a lower quality of educational resources, a more disadvantageous student/staff ratio, and greater teacher shortage as reported by school principals (Table II.4.9 in *PISA 2009 Results Volume II*). Such challenges are, however, not uncommon across OECD countries.

■ Figure 2.5 ■

Relationship between school performance and schools' socio-economic background in United States



Source: OECD, *PISA 2009 Database*.

StatLink http://dx.doi.org/10.1787/888932366636

While it might be tempting to attribute a performance lag of countries to the challenges that immigrant inflows pose to the education system, the reading performance of students in the United States without an immigrant background is, at 506 score points, only marginally higher than the performance of all students. In fact, the reading performance gap between students with and without an immigrant background is smaller in the United States than the average gap across OECD countries (Table II.4.1 in *PISA 2009 Results Volume II*), and particularly after the socio-economic background of students is accounted for (Table II.4.1 in *PISA 2009 Results Volume II*). The same holds if the language spoken at home, instead of the immigrant background of the student, is used for comparing student groups. Among the countries that took part in the latest PISA assessment, Switzerland, Canada and New Zealand have larger immigrant intakes than the United States, but score significantly better (Figure 2.6).

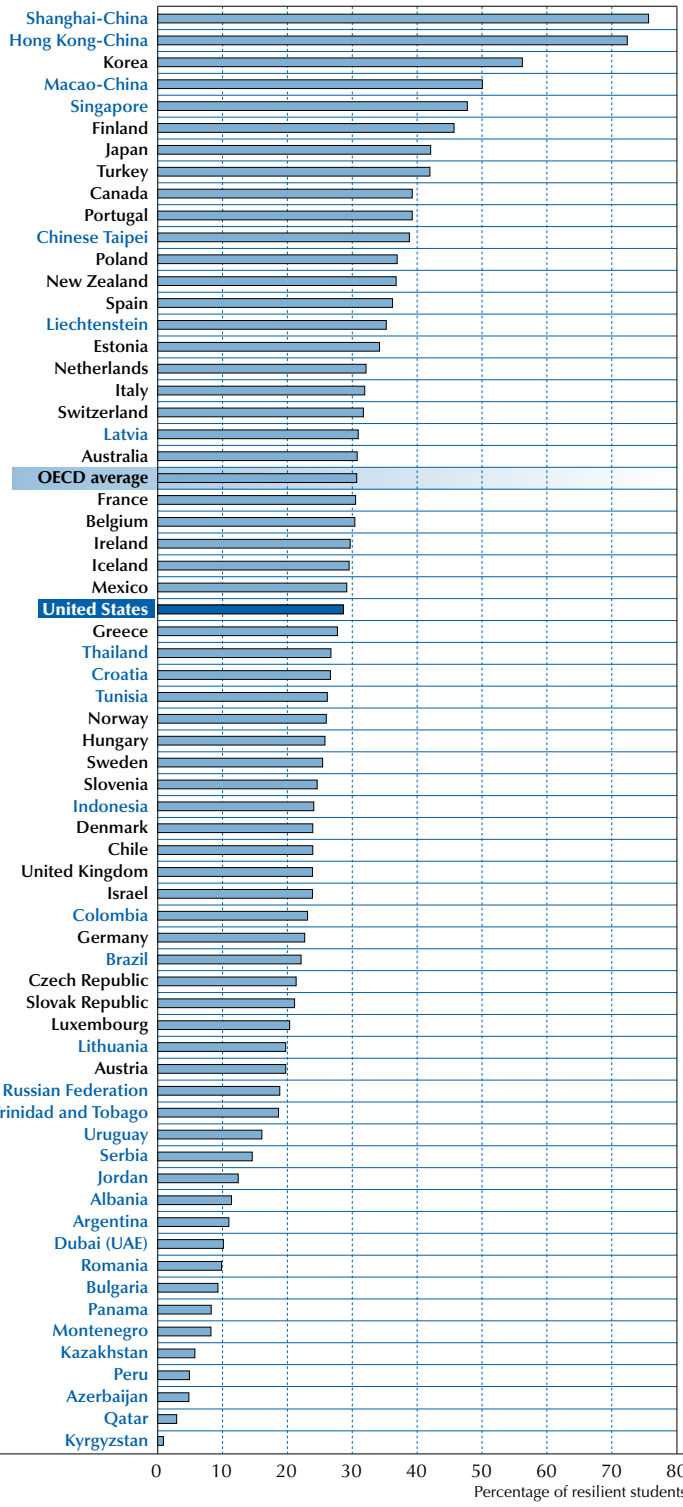
■ Figure 2.6 ■

Students' reading performance, by percentage of students with an immigrant background

Source: OECD, *PISA 2009 Database*, Table II.4.1.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.7 ■

Percentage of resilient students among disadvantaged students



Note: A student is classified as resilient if he or she is in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in the country of assessment and performs in the top quarter across students from all countries after accounting for socio-economic background. The share of resilient students among all students has been multiplied by 4 so that the percentage values presented here reflect the proportion of resilient students among disadvantaged students (those in the bottom quarter of the PISA index of social, economic and cultural status).

Source: OECD, *PISA 2009 Database,* Table II.3.3.

StatLink http://dx.doi.org/10.1787/888932366636

Concentration of socio-economic disadvantaged students in schools: In the United States, there are 32% of students in schools with a socio-economically disadvantaged intake, of which 61% are students who are socio-economically disadvantaged themselves (*i.e.* they are grossly over-represented), while 30% of students are in socio-economically privileged schools of which only 6% are socio-economically disadvantaged themselves. Disadvantaged students tend to do as expected in disadvantaged schools and advantaged students tend to do worse than expected, but by about the same margin as in many other OECD countries. In schools with a mixed socio-economic intake, disadvantaged students tend to do better than expected, again by the same margin as in the OECD in general, and advantaged students tend to do as expected. In schools with a privileged socio-economic intake, disadvantaged students tend to do better than expected (but by a smaller margin compared to other OECD countries) and advantaged students tend to do better than expected (within a similar margin of other OECD countries) (Table II.5.11 in *PISA 2009 Results, Volume II*).

In general, the accuracy with which socio-economic background predicts student performance varies considerably across countries. Most of the students who perform poorly in PISA share a challenging socio-economic background and yet some of their socio-economically disadvantaged peers excel in PISA and beat the odds working against them. These students show that overcoming socio-economic barriers to achievement is possible. While the prevalence of resilience is not the same across educational systems, it is possible to identify substantial numbers of resilient students in practically all OECD countries.[11] In the United States, 7% of students can be considered resilient, in the sense that they come from the 25% of the most socio-economically disadvantaged students but nevertheless perform much better than would be predicted based on their socio-economic background (7% is also the average in the OECD) (Figure 2.7). However, in Korea, Hong Kong-China and Shanghai-China, the share of disadvantaged students who excel at school despite their disadvantaged background is about twice as high.

The cost of the achievement gap

The international achievement gap is imposing on the United States economy an invisible yet recurring economic loss that is greater than the output shortfall in what has been called the worst economic crisis since the Great Depression. Using economic modelling to relate cognitive skills – as measured by PISA and other international instruments – to economic growth shows (with some caveats) that even small improvements in the skills of a nation's labour force can have large impacts on that country's future well-being. A recent study carried out by the OECD, in collaboration with the Hoover Institute at Stanford University, suggests that a modest goal of having the United States boost its average PISA scores by 25 points over the next 20 years – which corresponds to the performance gains that some countries achieved between 2000 and 2009 alone – could imply a gain of USD 41 trillion for the United States economy over the lifetime of the generation born in 2010 (as evaluated at the start of reform in terms of the real present value of future improvements in GDP). Bringing the United States up to the average performance of Finland, the best-performing education system among OECD countries, could result in gains in the order of USD 103 trillion. Narrowing the achievement gap by bringing all students to a baseline level of proficiency for the OECD (a PISA score of about 400) could imply GDP increases for the United States of USD 72 trillion, according to historical growth relationships (OECD, 2010b). Longitudinal studies have also demonstrated that student performance at school is a good indicator of subsequent successful education and labour-market pathways (OECD, 2010a).

Although there are uncertainties associated with these estimates, the gains from improved learning outcomes, put in terms of current GDP, exceed today's value of the short-run business-cycle management. This is not to say that efforts should not be directed towards mitigating the short-term effects of the economic recession, but it is to say that long-term issues should not be neglected.

THE LEARNING ENVIRONMENT IN THE CLASSROOM AND AT SCHOOL

The effects of educational policies and practices on student achievement depend heavily on how they translate into increased learning in the classroom. Results from PISA suggest that, across OECD countries, schools and countries where students work in a climate characterised by expectations of high performance and the readiness to invest effort, good teacher-student relations and high teacher morale tend to achieve better results, on average across countries and particularly in some countries. Even after accounting for socio-economic background and other aspects of the learning environment measured by PISA, the results show that reading performance is positively related to higher values on the *PISA index of teacher-student relationship* in 10 OECD countries, including the United States; on the *index of disciplinary climate* in 16 OECD countries, including the United States; and on the *index of teacher-related factors affecting school climate* in 14 OECD countries, including the United States (Table IV.2.13c in *PISA 2009 Results Volume IV*). It is noteworthy that in no country is there a negative relationship between any of these factors and learning outcomes.

The learning environment is also shaped by parents and school principals. Parents who are interested in their children's education are more likely to support their school's efforts and participate in school activities, thus adding to available resources. These parents also tend to have an advantaged socio-economic background. In addition, school principals can define their schools' educational objectives and guide their schools towards them. PISA shows that school principals' perceptions of parents' constant pressure to adopt high academic standards and to raise student achievement tend to be positively related to higher school performance in 19 OECD countries, although that relationship is not apparent in the United States. In some other countries, much of this relationship is mediated by socio-economic factors (Tables IV.2.13b and IV.2.13c in *PISA 2009 Results Volume IV*).

PISA also shows that the socio-economic background of students and schools and key features of the learning environment are closely interrelated. Both link to performance in important ways, perhaps because students from socio-economically advantaged backgrounds bring with them a higher level of discipline and more positive perceptions of school values, or perhaps because parental expectations of good classroom discipline are higher, and teacher commitment is stronger, in schools with advantaged socio-economic intake. Conversely, disadvantaged schools may be under less parental pressure to reinforce effective disciplinary practices or ensure that absent or unmotivated teachers are replaced. In summary, students perform better in schools with a more positive school climate, partly because such schools tend to have more students from advantaged backgrounds who generally perform well, partly because the favourable socio-economic characteristics of students reinforce the favourable climate, and partly for reasons unrelated to socio-economic variables. In many countries, the effect of parental pressure is particularly closely related to socio-economic background, with little independent effect, whereas factors related to the climate within the school, such as discipline and teacher-student relations, are also related to performance independently of socio-economic and demographic variables.

Some of the factors underlying these analyses are examined in greater detail in the following sections, which also position the United States along the various dimensions.

Teacher-student relations

Positive teacher-student relations can help to establish an environment that is conducive to learning. Research finds that students, particularly disadvantaged students, tend to learn more and have fewer disciplinary problems when they feel that their teachers take them seriously. One explanation is that positive teacher-student relations help foster social relationships, create communal learning environments and promote and strengthen adherence to norms conducive to learning. PISA asked students to agree or disagree with several statements regarding their relationships with their teachers in school. These statements include whether students get along with the teachers and whether teachers are interested in their personal well-being, whether teachers take the student seriously, whether teachers are a source of support if students need extra help, and whether teachers treat the student fairly. Students in the United States reported one of the best teacher-student relations among OECD countries (Figure IV.4.1 in *PISA 2009 Results Volume IV*). For example, over 80% of students in the United States agree or strongly agree that their teachers are interested in their well-being, whereas only 28% of students in Japan do so. As in the majority of countries, there is a positive relationship between teacher-student relations and student performance in both the United States and Japan. For example, the quarter of students in the United States who reported the poorest relationships with their teachers are 1.6 times more likely to be also among the quarter of the poorest performing students (for Japan the odds are 2.0).[12] Differences in student-reported teacher interest in their well-being may reflect either different student expectations of the level of involvement of their teachers, or different roles that teachers assume with respect to their students. A low percentage of agreement with these statements suggests a possible mismatch between student expectations and what teachers are actually doing.

Disciplinary climate

The disciplinary climate in the classroom and school can also affect learning. Classrooms and schools with more disciplinary problems are less conducive to learning, since teachers have to spend more time creating an orderly environment before instruction can begin. More interruptions within the classroom disrupt students' engagement and their ability to follow the lessons. PISA asked students to describe the frequency with which interruptions occur in reading lessons. The disciplinary climate is indicated in PISA by how often student do not listen to the teacher during lessons on the language of instruction; there is noise and disorder; the teacher has to wait a long time for students to quiet down; students cannot work well; and students do not start working for a long time after the lesson begins. The majority of students in OECD countries enjoy orderly classrooms in their language classes. Some 75% of students report that they never or only in some lessons feel that students do not start working for a long time after the lesson begins; 71% of students report that they never or only in some lessons feel that students do not listen; 68% report that noise never or only in some lessons affects learning; 72% say that their teacher never or only in some lessons has to wait a long time before students settle down; and 81% of the students attend classrooms where they feel they can work well practically most of the time (Figure IV.4.2 in *PISA 2009 Results Volume IV*).

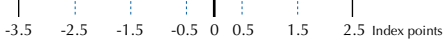
■ Figure 2.8 ■

School principals' views of how teacher behaviour affects students' learning

Index of teacher-related factors affecting school climate based on school principals' reports

- A Teachers' low expectations of students
- B Poor student-teacher relations
- C Teachers not meeting individual students' needs
- D Teacher absenteeism
- E Staff resisting change
- F Teachers being too strict with students
- G Students not being encouraged to achieve their full potential

		Percentage of students in schools whose principals reported that the following phenomena hindered learning "not at all" or "very little"							Range between top and bottom quarter / Average index	Variability in the index (S.D.)
		A	B	C	D	E	F	G		
OECD	Australia	68	85	58	86	61	96	78		0.91
	Austria	86	94	78	78	76	97	87		0.84
	Belgium	87	96	76	75	71	96	84		0.86
	Canada	86	89	75	88	62	94	86		0.82
	Chile	51	92	62	69	60	86	57		1.00
	Czech Republic	83	83	94	96	86	90	75		0.72
	Denmark	95	97	88	89	91	98	93		0.82
	Estonia	82	87	68	89	87	82	77		0.83
	Finland	94	88	67	80	84	97	86		0.69
	France	w	w	w	w	w	w	w		w
	Germany	82	93	77	78	70	96	89		0.75
	Greece	64	82	70	86	76	89	76		1.05
	Hungary	94	96	94	94	90	89	69		0.86
	Iceland	90	88	71	83	84	97	92		0.85
	Ireland	78	92	76	88	82	89	84		0.87
	Israel	73	86	67	71	80	90	80		0.86
	Italy	74	73	73	91	48	85	67		0.84
	Japan	76	85	71	97	63	81	61		0.87
	Korea	66	90	67	99	66	84	83		0.79
	Luxembourg	95	88	64	82	84	89	71		0.71
	Mexico	65	81	69	78	59	80	60		1.01
	Netherlands	66	90	44	62	61	86	45		0.67
	New Zealand	63	83	57	95	73	95	82		0.79
	Norway	80	90	52	75	79	98	77		0.71
	Poland	90	98	89	77	85	98	91		0.86
	Portugal	74	96	77	98	67	100	79		0.90
	Slovak Republic	87	94	88	80	79	75	78		0.79
	Slovenia	83	90	78	85	68	87	81		0.84
	Spain	75	91	85	91	67	92	74		0.92
	Sweden	77	93	64	87	67	99	75		0.83
	Switzerland	94	91	81	96	74	97	89		0.73
	Turkey	28	25	39	30	25	32	27		1.29
	United Kingdom	79	97	77	87	83	98	92		0.80
	United States	77	90	72	91	68	96	84		0.79
	OECD average	78	88	72	83	72	90	77		0.84
Partners	Albania	86	91	91	96	93	97	81		0.84
	Argentina	70	88	73	51	62	87	55		1.09
	Azerbaijan	67	67	80	82	81	91	76		1.09
	Brazil	56	89	58	70	64	92	65		0.95
	Bulgaria	73	84	70	73	87	88	72		1.13
	Colombia	66	93	66	79	49	81	63		1.09
	Croatia	79	90	75	94	58	90	72		0.82
	Dubai (UAE)	86	89	80	86	77	87	92		1.23
	Hong Kong-China	58	93	52	87	77	94	69		0.81
	Indonesia	86	96	90	97	90	92	69		0.87
	Jordan	60	62	64	58	61	86	69		1.08
	Kazakhstan	43	60	55	60	66	60	58		1.38
	Kyrgyzstan	54	71	69	66	64	65	59		1.37
	Latvia	90	93	81	91	93	89	77		0.83
	Liechtenstein	94	100	80	100	83	100	100		0.49
	Lithuania	94	99	93	98	96	99	96		0.68
	Macao-China	73	73	44	66	66	83	57		1.38
	Montenegro	85	95	73	88	88	93	58		0.71
	Panama	62	89	69	75	57	81	61		1.03
	Peru	64	91	72	85	69	83	63		0.95
	Qatar	77	80	82	88	84	88	85		1.07
	Romania	84	90	89	99	69	91	83		0.80
	Russian Federation	60	79	68	78	65	56	58		1.07
	Serbia	71	94	70	93	59	84	61		0.78
	Shanghai-China	58	59	45	71	60	73	47		1.33
	Singapore	64	83	59	84	83	90	90		0.92
	Chinese Taipei	52	57	54	70	56	67	52		1.42
	Thailand	67	82	72	90	90	68	87		0.86
	Trinidad and Tobago	45	66	34	41	54	91	71		0.94
	Tunisia	33	83	69	40	73	83	74		0.86
	Uruguay	53	92	68	35	57	94	33		1.03



Note: Higher values on the index indicate a positive teacher behaviour.
Source: OECD, *PISA 2009 Database*, Table IV.4.5.
StatLink http://dx.doi.org/10.1787/888932366636

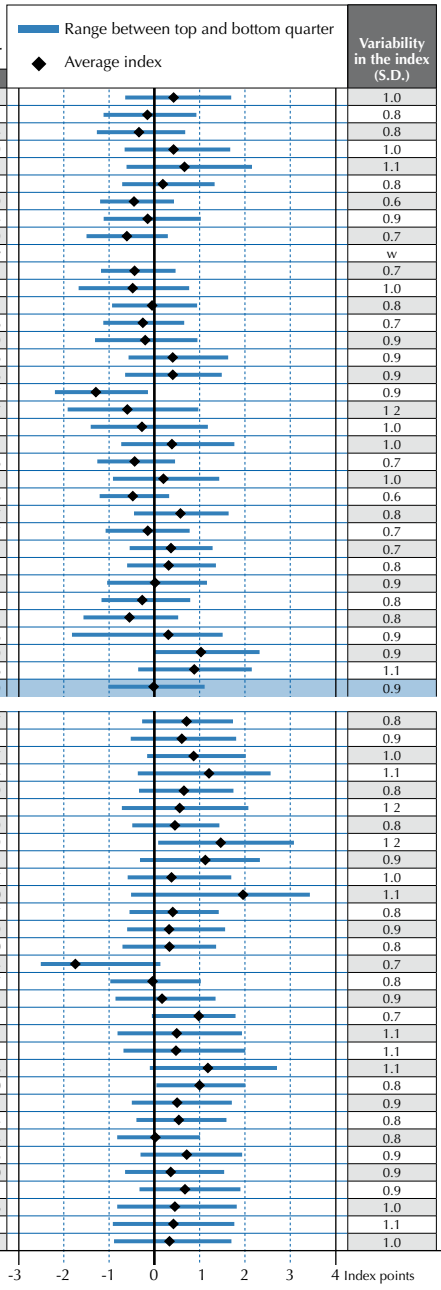
■ Figure 2.9 ■

School principals' views of their involvement in school matters

Index of school principal's leadership based on school principals' reports

A	I make sure that the professional development activities of teachers are in accordance with the teaching goals of the school.
B	I ensure that teachers work according to the school's educational goals.
C	I observe instruction in classrooms.
D	I use student performance results to develop the school's educational goals.
E	I give teachers suggestions as to how they can improve their teaching.
F	I monitor students' work.
G	When a teacher has problems in his/her classroom, I take the initiative to discuss matters.
H	I inform teachers about possibilities for updating their knowledge and skills.
I	I check to see whether classroom activities are in keeping with our educational goals.
J	I take exam results into account in decisions regarding curriculum development.
K	I ensure that there is clarity concerning the responsibility for co-ordinating the curriculum.
L	When a teacher brings up a classroom problem, we solve the problem together.
M	I pay attention to disruptive behaviour in classrooms.
N	I take over lessons from teachers who are unexpectedly absent.

		Percentage of students in schools whose principals reported that the following activities and behaviours occurred "quite often" or "very often" during the last school year														Variability in the index (S.D.)
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	
OECD	Australia	98	99	64	93	76	58	89	95	81	81	97	93	94	32	1.0
	Austria	89	92	41	60	67	86	84	79	67	22	75	92	87	53	0.8
	Belgium	95	97	43	42	68	33	89	90	82	46	74	98	96	4	0.8
	Canada	98	98	77	91	86	60	95	95	86	63	87	99	98	19	1.0
	Chile	97	98	55	93	95	73	90	96	82	84	94	97	97	62	1.1
	Czech Republic	95	98	57	81	79	93	86	98	83	59	93	96	75	23	0.8
	Denmark	86	89	25	44	53	39	94	91	76	25	76	99	95	29	0.6
	Estonia	92	94	59	84	58	75	72	93	57	62	87	83	79	24	0.9
	Finland	64	75	9	46	40	61	77	95	59	13	77	98	94	39	0.7
	France	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w
	Germany	82	94	40	57	53	82	80	85	57	33	73	95	84	42	0.7
	Greece	40	78	12	61	53	46	97	96	67	34	69	98	96	63	1.0
	Hungary	93	99	54	84	62	84	89	91	65	73	86	94	91	41	0.8
	Iceland	88	89	39	78	77	69	87	96	54	58	87	100	75	26	0.7
	Ireland	88	88	14	64	41	50	88	92	62	78	88	97	97	39	0.9
	Israel	94	99	46	87	85	81	94	89	86	90	94	97	98	26	0.9
	Italy	97	99	39	86	75	87	96	98	88	77	92	98	98	18	0.9
	Japan	43	51	37	30	38	40	29	50	31	37	29	61	60	17	0.9
	Korea	80	85	42	64	68	56	75	69	60	46	63	79	68	7	1.2
	Luxembourg	87	98	32	65	52	64	96	67	74	32	47	98	98	23	1.0
	Mexico	95	97	68	94	89	90	95	91	92	62	90	97	96	43	1.0
	Netherlands	95	97	52	66	73	50	76	82	79	75	80	86	71	16	0.7
	New Zealand	99	98	68	98	73	42	78	84	74	87	97	83	94	12	1.0
	Norway	81	88	24	70	49	55	90	91	48	47	81	98	95	28	0.6
	Poland	94	97	93	95	89	96	91	99	92	71	80	97	93	37	0.8
	Portugal	93	97	9	94	65	49	91	89	48	82	97	99	97	7	0.7
	Slovak Republic	97	99	86	87	86	90	86	98	91	76	96	91	91	15	0.7
	Slovenia	99	100	77	78	85	90	90	95	85	65	93	98	94	23	0.8
	Spain	86	97	28	85	55	45	86	86	66	71	92	99	99	63	0.9
	Sweden	90	96	38	83	63	29	89	90	52	68	93	98	87	13	0.8
	Switzerland	72	82	64	34	60	61	85	80	59	17	54	92	83	31	0.8
	Turkey	85	95	70	93	85	90	75	90	87	78	93	97	99	36	0.9
	United Kingdom	100	100	93	100	92	88	90	96	95	97	99	96	97	29	0.9
	United States	98	98	95	96	94	72	95	97	94	88	90	97	96	16	1.1
	OECD average	88	93	50	75	69	66	86	89	72	61	82	94	90	29	0.9
Partners	Albania	97	100	98	99	94	94	90	88	93	87	93	96	96	47	0.8
	Argentina	95	98	63	90	96	84	94	91	86	66	87	98	96	43	0.9
	Azerbaijan	95	96	97	89	97	99	86	96	99	86	90	90	99	77	1.0
	Brazil	99	99	60	94	94	91	97	97	91	94	94	99	99	44	1.1
	Bulgaria	100	100	92	95	79	93	87	98	94	71	98	91	96	29	0.8
	Colombia	98	99	45	85	92	88	90	96	82	87	92	96	96	31	1.2
	Croatia	94	98	70	80	92	96	96	95	98	76	95	99	100	19	0.8
	Dubai (UAE)	100	100	95	97	98	93	98	99	98	90	93	98	97	39	1.2
	Hong Kong-China	99	99	99	97	100	93	96	98	95	92	97	96	96	45	0.9
	Indonesia	94	99	88	91	99	77	89	96	96	95	96	81	93	47	1.0
	Jordan	99	100	100	99	100	98	99	99	99	81	81	100	99	90	1.1
	Kazakhstan	96	98	98	95	97	97	85	98	99	60	87	86	89	17	0.8
	Kyrgyzstan	90	92	98	90	94	98	89	96	95	82	87	86	81	29	0.9
	Latvia	96	97	80	97	83	86	85	94	85	75	83	76	85	30	0.8
	Liechtenstein	53	21	3	15	14	46	82	16	10	0	13	96	58	44	0.7
	Lithuania	97	98	47	92	75	60	74	89	55	65	89	95	83	7	0.8
	Macao-China	100	100	88	74	82	86	93	76	86	52	88	90	90	45	0.9
	Montenegro	95	100	88	97	97	100	92	100	99	84	100	100	96	23	0.7
	Panama	91	95	86	88	95	84	90	92	95	85	88	97	94	43	1.1
	Peru	94	98	86	88	93	80	80	94	92	84	91	91	95	45	1.1
	Qatar	96	100	100	98	97	94	95	95	98	84	87	96	98	28	1.1
	Romania	98	100	87	98	90	90	96	98	99	91	99	100	99	40	0.8
	Russian Federation	99	99	92	89	87	95	80	99	97	55	97	96	86	31	0.9
	Serbia	97	100	67	90	91	82	97	99	87	93	91	97	97	44	0.8
	Shanghai-China	98	98	94	57	99	69	91	93	96	70	98	99	89	14	0.8
	Singapore	100	100	80	99	94	66	93	93	93	98	98	97	96	8	0.9
	Chinese Taipei	98	98	92	84	86	94	86	98	88	90	95	97	95	20	0.9
	Thailand	94	99	88	98	95	97	94	98	94	96	98	97	97	45	0.9
	Trinidad and Tobago	97	98	60	86	88	71	94	95	84	92	95	97	98	26	1.0
	Tunisia	84	97	92	92	97	60	97	82	84	40	59	99	99	45	1.1
	Uruguay	85	98	89	90	90	81	92	94	84	45	73	98	100	25	1.0



Note: Higher values on the index indicate greater involvement of school principals in school matters.
Source: OECD, *PISA 2009 Database*, Table IV.4.8.
StatLink http://dx.doi.org/10.1787/888932366636

The United States does reasonably well on this measure, but the benchmark countries Japan, Korea or Germany show a significantly better disciplinary climate. What is also noteworthy is that there is considerable variation on this measure among students in the United States, and the quarter of students who reported the poorest disciplinary climate are twice as likely to be poor performers. This odds ratio is the second highest among all countries participating in PISA (OECD average odds 1.4) (Table IV.4.2 in *PISA 2009 Results Volume IV*).

It is noteworthy that the judgment of school principals on the disciplinary climate in the United States is less positive than what students report, and the mismatch between these perspectives may indicate differences in what students and school principals perceive to be problems (Table IV.4.4 in *PISA 2009 Results Volume IV*).[13]

Teacher-related factors affecting the school climate

To determine the extent to which teacher behaviour influences student learning, school principals in PISA were asked to report the extent to which they perceived learning in their schools to be hindered by such factors as teachers' low expectations of students, poor student-teacher relations, absenteeism among teachers, staff resistance to change, teachers not meeting individual students' needs, teachers being too strict with students, and students not being encouraged to achieve their full potential. The United States performed around the OECD average on these measures, but the reports from school principals highlight a number of challenges: 23% of students in the United States are enrolled in schools whose principals reported that teachers' low expectations of students hinder learning to some extent or a lot (in contrast, in the benchmark country Finland, that percentage is just 6%), 28% that this is the case because teachers do not meet individual students' needs, and 32% because staff resist change (Figure 2.8). In contrast, only 4% of school principals see teachers being too strict with students as a problem, and 10% or less see poor student-teacher relationships or teacher absenteeism as a problem that hinders learning.

HOW SCHOOLING IS ORGANISED

Governance of school systems

Many countries have pursued a shift in public and governmental concern away from mere control over the resources and content of education towards a focus on outcomes. This becomes evident when the distribution of decision-making responsibilities in education is reviewed across successive PISA assessments. In addition, school systems have made efforts to devolve responsibility to the frontline, encouraging responsiveness to local needs, and strengthening accountability (Figures 2.10 and 2.11). PISA shows a clear relationship between learning outcomes and the relative autonomy of schools in managing instructional policies and practices across systems when autonomy is coupled with accountability. Of course, the United States is a decentralised education system too, but while many systems have decentralised decisions concerning the delivery of educational services while keeping tight control over the definition of outcomes, the design of curricula, standards and testing, the United States is different in that it has decentralised both inputs and control over outcomes. That has only just begun to change with the recent introduction and progressive adoption, by individual states, of common core educational standards. Moreover, while the United States has devolved responsibilities to local authorities or districts, their schools often have less discretion in decision making than is the case in many OECD countries. In this sense, the question for the United States is not just how many charter schools it establishes but how to build the capacity for all schools to exercise responsible autonomy, as happens in most of the benchmark systems.

Important organisational features of school systems are the degree to which students and parents can choose schools, and the degree to which schools are considered autonomous entities that make organisational decisions independently of district, regional or national entities. Results from PISA suggest that school autonomy in defining curricula and assessments relates positively to the systems' overall performance (Figure 2.11, Figures IV.3.3 and IV.2.4a in *PISA 2009 Results Volume IV*). For example, school systems that provide schools with greater discretion in making decisions regarding student assessment policies, the courses offered, the course content and the textbooks used, tend to be school systems that perform at higher levels.

Data from PISA also show that in school systems where most schools post achievement data publicly, schools with greater discretion in managing their resources tend to show higher levels of performance. In school systems where schools do not post achievement data publicly, a student who attends a school with greater autonomy in resource management than the average OECD school tends to perform 3.2 score points lower in reading than a student attending a school with an average level of autonomy. In contrast, in school systems where schools do post achievement data publicly, a student who attends a school with above-average autonomy scores 2.6 points *higher* in reading than a student attending a school with an average level of autonomy (Table IV.2.5 in *PISA 2009 Results Volume IV*).

■ Figure 2.10 ■

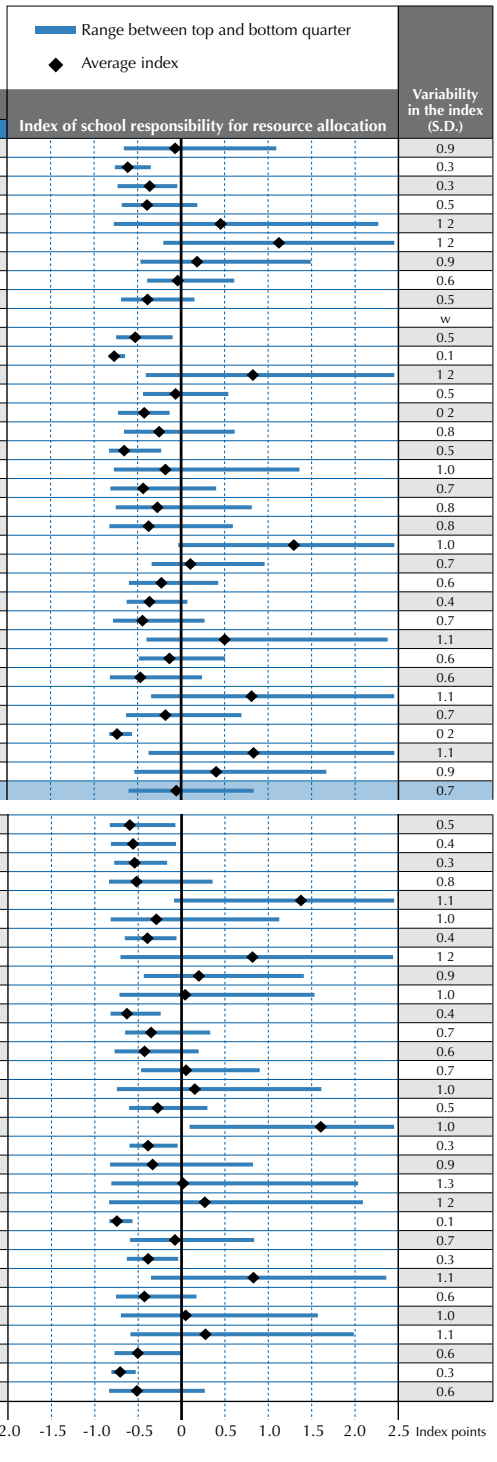
How much autonomy individual schools have over resource allocation

Percentage of students in schools whose principals reported that only "principals and/or teachers", only "regional and/or national education authority" or both "principals and/or teachers" and "regional and/or national education authority" have a considerable responsibility for the following tasks

A Selecting teachers for hire
B Dismissing teachers
C Establishing teachers' starting salaries
D Determining teachers' salaries increases
E Formulating the school budget
F Deciding on budget allocations within the school

1 Only "principals and/or teachers"
2 Both "principals and/or teachers" and "regional and/or national education authority"
3 Only "regional and/or national education authority"

		A			B			C			D			E			F			Variability in the index (S.D.)
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
OECD	Australia	61	20	19	43	12	45	12	5	84	13	6	81	68	16	16	93	6	0	0.9
	Austria	13	35	52	5	26	68	1	0	99	1	0	99	11	9	80	84	12	4	0.3
	Belgium	75	13	12	63	21	17	0	1	99	0	1	99	56	18	26	63	19	17	0.3
	Canada	54	39	7	17	35	48	3	5	92	4	6	91	25	30	45	76	19	5	0.5
	Chile	69	8	23	59	3	38	37	1	62	37	1	62	55	9	36	71	9	20	1 2
	Czech Republic	100	0	0	99	1	0	77	15	8	65	25	11	55	36	9	75	24	1	1 2
	Denmark	97	2	0	69	15	16	20	10	70	16	14	70	80	13	8	98	2	0	0.9
	Estonia	98	2	0	95	5	0	7	20	73	12	33	55	37	54	9	85	15	1	0.6
	Finland	32	43	25	18	19	63	8	7	84	5	15	80	36	41	23	92	6	1	0.5
	France	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w
	Germany	29	36	34	7	14	79	3	0	97	4	15	81	29	4	67	97	2	2	0.5
	Greece	0	1	99	0	2	98	0	0	100	0	0	100	34	7	59	59	7	34	0.1
	Hungary	99	1	0	97	2	1	49	7	44	56	7	37	73	15	12	92	5	2	1 2
	Iceland	94	6	0	93	7	0	7	13	80	4	16	80	57	30	13	77	22	0	0.5
	Ireland	61	25	14	36	14	50	0	2	98	1	0	99	60	13	27	89	5	6	0 2
	Israel	67	30	3	49	38	13	9	4	87	13	6	80	15	26	59	66	24	11	0.8
	Italy	9	10	82	9	6	84	3	0	97	3	0	96	7	7	86	69	11	21	0.5
	Japan	25	2	73	22	1	77	13	0	87	16	3	80	28	4	69	89	3	8	1.0
	Korea	32	6	62	23	4	74	8	0	92	6	0	94	29	12	58	86	6	8	0.7
	Luxembourg	21	41	38	19	36	45	6	0	94	6	0	94	31	57	12	78	14	8	0.8
	Mexico	34	5	61	22	4	73	8	0	92	6	0	94	46	6	48	71	7	22	0.8
	Netherlands	100	0	0	99	1	0	72	8	20	55	12	33	99	1	0	100	0	0	1.0
	New Zealand	100	0	0	89	7	4	9	3	88	15	21	64	95	4	1	99	1	0	0.7
	Norway	72	21	6	44	22	34	8	4	88	6	13	81	55	28	17	88	12	1	0.6
	Poland	87	12	1	90	10	0	9	20	71	4	20	77	7	42	51	26	43	31	0.4
	Portugal	13	57	30	14	0	86	5	0	94	5	0	94	63	10	27	89	3	8	0.7
	Slovak Republic	98	2	0	98	2	0	39	27	34	32	33	35	45	40	15	70	27	3	1.1
	Slovenia	96	4	1	88	10	1	7	11	82	13	31	56	26	49	26	78	21	1	0.6
	Spain	31	3	66	32	1	67	3	2	95	3	2	95	63	4	33	93	4	3	0.6
	Sweden	96	4	0	63	17	20	57	16	27	69	22	9	64	20	16	93	5	2	1.1
	Switzerland	82	15	3	60	26	15	8	8	84	8	13	79	35	30	35	83	13	4	0.7
	Turkey	1	1	99	2	2	96	1	0	99	1	0	99	34	19	47	56	16	28	0 2
	United Kingdom	90	9	0	70	22	8	52	23	25	67	17	15	57	29	14	95	5	1	1.1
	United States	88	12	0	75	19	6	17	5	78	18	6	75	54	29	16	83	13	4	0.9
	OECD average	61	14	25	51	13	37	17	7	77	17	10	73	46	22	32	81	12	8	0.7
Partners	Albania	8	14	78	7	14	79	3	0	97	3	1	96	33	12	55	61	8	31	0.5
	Argentina	44	5	51	27	3	70	2	1	97	1	4	96	22	5	73	64	12	24	0.4
	Azerbaijan	40	22	38	61	17	22	35	6	59	13	3	84	5	6	89	20	4	76	0.3
	Brazil	17	7	76	14	8	78	8	1	91	7	1	92	14	5	80	21	6	73	0.8
	Bulgaria	93	5	2	97	2	1	66	20	14	84	12	4	73	22	5	92	7	1	1.1
	Colombia	21	5	75	21	1	78	14	0	86	13	1	86	58	5	36	87	5	8	1.0
	Croatia	90	10	0	84	11	5	1	1	98	2	1	97	26	34	40	68	23	9	0.4
	Dubai (UAE)	65	12	23	67	9	24	62	3	34	68	1	31	75	2	22	92	3	5	1 2
	Hong Kong-China	83	15	2	79	17	4	18	24	58	15	12	74	84	15	2	91	9	0	0.9
	Indonesia	29	12	59	26	11	63	20	9	70	23	11	66	83	11	5	78	14	8	1.0
	Jordan	6	1	93	4	1	95	1	1	98	2	0	98	83	1	17	70	2	28	0.4
	Kazakhstan	88	10	2	95	4	2	17	10	73	8	10	82	8	13	79	17	19	64	0.7
	Kyrgyzstan	74	14	11	68	13	19	18	4	77	13	3	84	12	7	81	19	7	74	0.6
	Latvia	94	4	2	96	4	0	10	15	75	18	25	57	62	25	12	81	16	3	0.7
	Liechtenstein	41	0	59	37	0	63	6	0	94	39	17	45	37	0	63	100	0	0	1.0
	Lithuania	96	4	0	99	1	0	11	7	81	6	8	86	25	27	48	42	29	28	0.5
	Macao-China	92	4	4	91	5	4	91	4	5	90	4	5	95	5	0	84	16	0	1.0
	Montenegro	89	11	0	82	18	0	0	5	95	10	11	78	12	21	68	65	22	13	0.3
	Panama	22	3	76	20	8	72	14	5	81	14	8	79	70	15	15	43	10	47	0.9
	Peru	38	15	47	30	9	61	22	2	76	22	2	77	60	9	31	79	6	15	1.3
	Qatar	52	3	44	54	5	41	47	3	50	47	4	50	43	4	53	52	4	44	1 2
	Romania	1	9	91	4	11	86	0	2	97	1	4	95	7	25	68	40	13	47	0.1
	Russian Federation	95	4	1	95	5	0	35	15	50	29	20	51	8	30	63	46	28	27	0.7
	Serbia	72	28	1	64	30	7	1	8	90	16	19	65	9	27	64	74	16	10	0.3
	Shanghai-China	98	2	0	99	1	0	36	5	59	43	6	51	91	2	6	98	1	1	1.1
	Singapore	14	38	48	14	24	62	4	3	93	7	17	75	49	22	29	91	8	1	0.6
	Chinese Taipei	73	13	14	74	14	12	18	7	75	23	7	70	50	13	37	78	8	14	1.0
	Thailand	30	20	50	59	12	28	29	14	56	72	24	5	70	20	10	90	7	2	1.1
	Trinidad and Tobago	17	14	69	6	4	90	2	1	96	6	5	89	46	28	26	75	12	12	0.6
	Tunisia	2	0	98	1	0	99	1	1	99	1	0	99	10	18	72	78	13	9	0.3
	Uruguay	17	5	78	13	1	86	3	1	96	2	1	96	13	12	75	49	16	35	0.6



Source: OECD, *PISA 2009 Database*, Table IV.3.5.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.11 ■

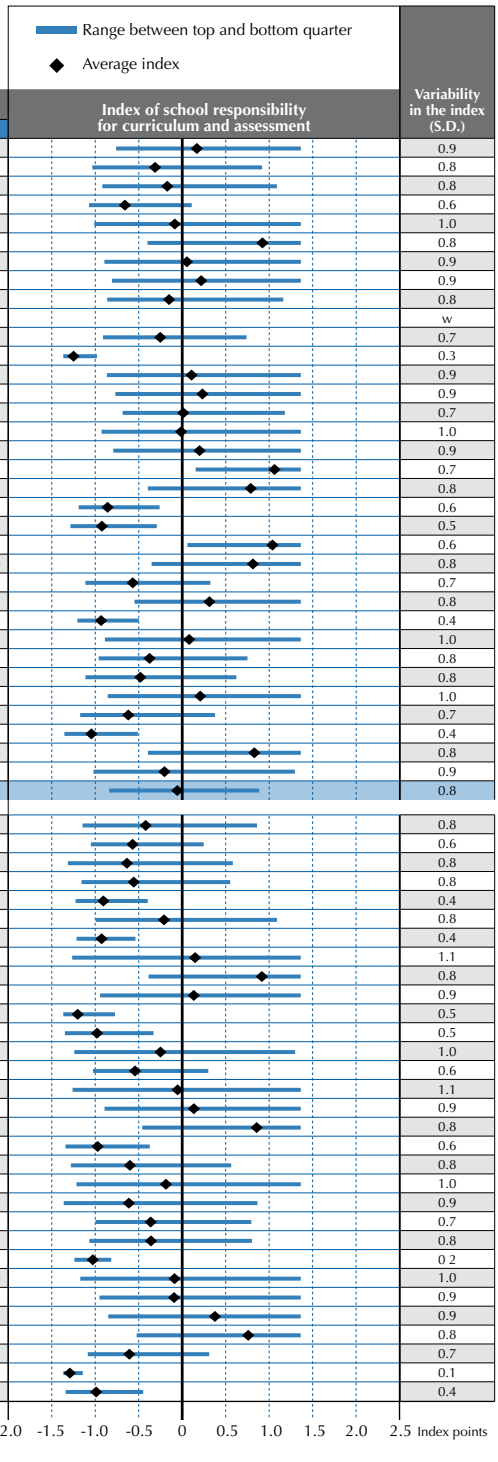
How much autonomy individual schools have over curricula and assessments

Percentage of students in schools whose principals reported that only "principals and/or teachers", only "regional and/or national education authority" or both "principals and/or teachers" and "regional and/or national education authority" have a considerable responsibility for the following tasks

A Establishing student assessment policies
B Choosing which textbooks are used
C Determining course content
D Deciding which courses are offered

1 Only "principals and/or teachers"
2 Both "principals and/or teachers" and "regional and/or national education authority"
3 Only "regional and/or national education authority"

	A			B			C			D			Index of school responsibility for curriculum and assessment	Variability in the index (S.D.)
	1	2	3	1	2	3	1	2	3	1	2	3		
OECD Australia	65	33	2	92	8	0	46	40	14	75	24	1		0.9
Austria	57	27	15	94	5	1	37	40	23	32	40	29		0.8
Belgium	78	19	4	94	4	1	32	42	26	40	46	13		0.8
Canada	28	62	10	40	49	11	12	51	38	44	54	3		0.6
Chile	72	21	6	73	20	7	43	22	35	64	20	16		1.0
Czech Republic	95	5	0	89	11	1	83	16	1	88	11	1		0.8
Denmark	61	28	11	100	0	0	56	32	12	47	39	14		0.9
Estonia	63	33	3	66	32	2	66	30	4	79	20	2		0.9
Finland	50	43	7	98	2	0	32	52	16	55	39	6		0.8
France	w	w	w	w	w	w	w	w	w	w	w	w		w
Germany	71	21	9	84	13	3	21	47	32	80	18	2		0.7
Greece	20	12	68	7	8	85	1	3	96	6	5	88		0.3
Hungary	94	6	0	98	2	0	49	36	15	43	28	29		0.9
Iceland	92	8	1	93	4	3	61	26	13	48	42	10		0.9
Ireland	87	13	0	97	3	0	29	37	34	78	21	1		0.7
Israel	80	20	0	53	43	4	52	44	5	44	50	6		1.0
Italy	91	8	1	99	1	0	59	27	14	49	25	27		0.9
Japan	98	2	0	89	8	3	93	6	1	94	5	2		0.7
Korea	92	6	2	96	4	0	89	8	2	79	17	4		0.8
Luxembourg	9	33	58	13	80	7	9	72	20	18	61	21		0.6
Mexico	56	15	29	63	11	26	14	7	79	5	5	91		0.5
Netherlands	99	1	0	100	0	0	87	12	1	89	10	1		0.6
New Zealand	81	17	2	99	1	0	79	20	1	92	8	0		0.8
Norway	38	36	27	97	2	1	30	40	30	23	33	44		0.7
Poland	92	8	0	92	8	0	93	7	0	40	31	29		0.8
Portugal	35	37	28	98	2	0	5	3	92	10	5	86		0.4
Slovak Republic	76	21	3	56	39	5	48	47	5	52	48	1		1.0
Slovenia	46	48	5	72	27	1	34	59	6	28	52	20		0.8
Spain	44	34	23	95	5	0	32	31	37	30	31	39		0.8
Sweden	66	30	3	99	1	0	66	26	8	53	25	22		1.0
Switzerland	57	27	16	40	40	20	21	41	38	24	50	27		0.7
Turkey	42	29	30	14	18	68	9	15	76	14	21	65		0.4
United Kingdom	88	12	0	98	2	0	77	20	2	86	14	0		0.8
United States	46	40	13	62	28	10	36	46	18	58	37	4		0.9
OECD average	66	23	11	78	15	8	45	31	24	50	28	21		0.8
Partners Albania	51	16	33	91	8	1	35	7	57	35	12	53		0.8
Argentina	74	20	6	81	16	3	28	43	29	8	30	61		0.6
Azerbaijan	54	8	38	50	6	43	27	9	64	37	5	58		0.8
Brazil	47	27	26	88	9	2	35	25	40	18	17	65		0.8
Bulgaria	25	37	38	88	12	1	10	26	65	10	15	75		0.4
Colombia	39	21	39	92	3	4	69	23	8	64	14	23		0.8
Croatia	26	36	38	63	34	3	11	50	39	2	25	72		0.4
Dubai (UAE)	77	10	13	55	17	27	62	13	26	59	16	25		1.1
Hong Kong-China	93	7	0	93	7	0	81	17	2	87	13	0		0.8
Indonesia	67	28	6	80	13	7	75	18	7	49	23	28		0.9
Jordan	27	4	70	4	1	95	7	1	93	7	1	92		0.5
Kazakhstan	31	22	47	16	14	70	11	18	71	40	22	37		0.5
Kyrgyzstan	65	8	26	68	8	23	59	10	31	44	7	49		1.0
Latvia	56	40	4	71	27	2	19	46	36	30	42	28		0.6
Liechtenstein	69	25	6	54	5	40	41	0	59	53	9	38		1.1
Lithuania	75	20	5	89	11	1	50	35	15	75	20	5		0.9
Macao-China	95	0	5	100	0	0	94	6	0	81	14	4		0.8
Montenegro	40	32	28	5	30	65	5	34	61	20	36	44		0.6
Panama	41	25	34	52	26	22	41	23	36	26	23	51		0.8
Peru	75	15	10	52	12	37	53	23	24	45	18	37		1.0
Qatar	45	18	37	37	16	47	31	9	60	35	17	48		0.9
Romania	42	36	22	86	13	1	46	33	20	31	41	29		0.7
Russian Federation	63	25	12	65	27	8	21	40	39	71	22	7		0.8
Serbia	49	44	7	19	59	23	2	41	57	0	12	87		0 2
Shanghai-China	86	9	5	49	17	34	45	22	33	52	28	20		1.0
Singapore	57	41	2	72	24	3	44	38	18	66	31	4		0.9
Chinese Taipei	74	17	8	92	8	0	81	16	3	68	25	7		0.9
Thailand	79	18	2	89	10	1	89	11	0	91	8	1		0.8
Trinidad and Tobago	50	45	5	29	62	10	21	40	39	34	51	15		0.7
Tunisia	11	11	78	0	1	99	3	14	83	4	9	87		0.1
Uruguay	23	30	47	31	36	33	3	26	71	21	19	59		0.4



Source: OECD, *PISA 2009 Database*, Table IV.3.6.
StatLink http://dx.doi.org/10.1787/888932366636

PISA classifies OECD countries into four groups that share similar profiles in the way they allow schools and parents to make decisions that affect their children's education. The grouping is based on the levels of school autonomy and school competition. Two categories are identified for each dimension and the interplay between these dimensions results in four groups: school systems that offer high levels of autonomy to schools in designing and using curricula and assessments and encourage more competition between schools; school systems that offer low levels of autonomy to schools and limit competition between schools; school systems that offer high levels of autonomy to schools, but with limited competition between schools; and school systems that offer low levels of autonomy to schools, yet encourage more competition between schools (Figure IV.3.5 in *PISA 2009 Results Volume IV*).

Across OECD countries, the most common configuration is the one that gives schools the freedom to make curricular decisions, yet restricts competition for enrolment among schools. These school systems have relatively limited levels of choice for parents and students and there is little competition for enrolment among schools. Private schools are not widely available in these countries. Twenty-two OECD countries, including the United States, fall into this category.

School systems that offer relatively low levels of autonomy to schools and low levels of choice to parents are also fairly common across OECD countries: four OECD countries share this configuration and 11 partner countries and economies do.

Six other OECD countries offer high levels of autonomy and choice, either in the form of a high prevalence private schools or competition among schools for enrolment. In these school systems, schools have the freedom to choose teaching methods to meet learning objectives, and parents and students can choose among a variety of schools for enrolment. Some of the variables underlying this classification are examined in greater detail below.

School choice

Students in some school systems are encouraged or even obliged to attend their neighbourhood school. However, reforms over the past decades in many countries have tended to give more authority to parents and students to choose schools that meet their educational needs or preferences best. The assumption has been that if students and parents have sound information and choose schools based on academic criteria, this will foster competition among schools and create incentives for institutions to organise programmes and teaching in ways that better respond to diverse student requirements and interests, thus reducing the costs of failure and mismatches. In some school systems, schools not only compete for student enrolment, but also for funding. Direct public funding of independently managed institutions, based on student enrolments or student credit-hours, is one model for this. Giving money to students and their families to spend in public or private educational institutions of their choice through, for example, scholarships or vouchers, is another method (Figure 2.12).

According to the responses of school principals in PISA, across OECD countries, 76% of students attend schools competing with at least one other school for enrolment. Only in Switzerland, Norway and Slovenia do less than 50% of students attend schools that compete with other schools for enrolment. In contrast, in the Netherlands, Australia, Belgium, the Slovak Republic and Japan, over 90% of students attend schools that compete with other schools for enrolment (Table IV3.8a in *PISA 2009 Results Volume IV*).

Some 13 OECD countries allow parents and students to choose public schools and also incorporate vouchers or tax credits in their school-choice arrangements. Eleven OECD countries provide for freedom in the choice of public schools, but do not offer vouchers or tax credits; two OECD countries restrict parents and students in the choice of public schools, but offer tax or voucher credits to attend other schools; and in four OECD countries, parents and students must attend the public school nearest to where they live and are not offered any kind of subsidy to attend other schools (Table IV.3.7 in *PISA 2009 Results Volume IV*).

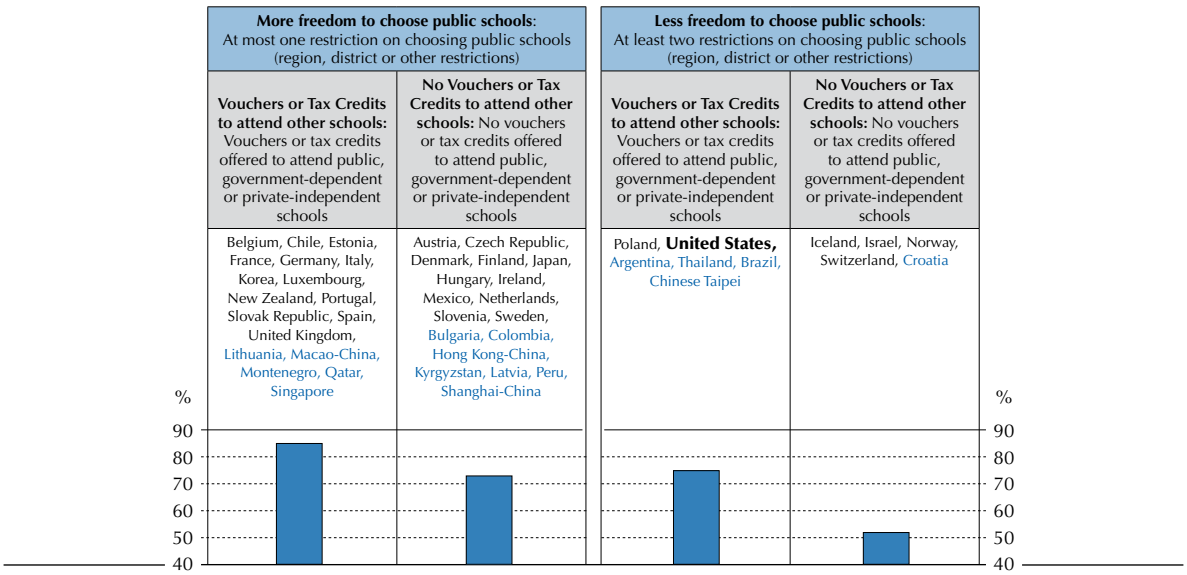
Competition among schools, as reported by school principals in PISA, is consistent with these school-choice arrangements as reported by central and regional governments, and is greatest in school systems that grant parents and students the freedom to choose public schools and offer subsidies in the form of vouchers or tax credits to attend other schools. In countries with these characteristics, 85% of students attend schools whose principals reported that they compete with at least one other school for enrolment. The lowest levels of school competition are found in countries that restrict attendance to public schools and do not offer subsidies to attend other schools. In the average country in this category, 52% of students attend schools whose principals reported that they compete for student enrolment with at least one other school (Figure 2.12). Levels of school competition are similar in countries that restrict attendance to public schools and offer subsidies, and in countries that do not restrict attendance to

public schools yet offer no subsidies. In these countries, around 75% of students attend schools whose principals reported that they compete with other schools for enrolment. The use of vouchers or tax credits and opening choice among public schools enhances school competition for students. However, competition among schools is less frequent in remote and rural areas, where public schools are usually located at greater distances from each other, making it more difficult for parents and students to choose a school other than the one that is closest to their home (Table IV.2.6 in *PISA 2009 Results Volume IV*).

■ Figure 2.12 ■

Countries in which parents can choose schools for their children

Prevalence of school competition by school choice arrangements



Note: Bars represent the average percentages of school competition in OECD countries, by four categories of school choice arrangements.
Source: OECD, *PISA 2009 Database*, Tables IV.3.7 and IV.3.8a.
StatLink http://dx.doi.org/10.1787/888932366636

Among schools within a country, competition and performance do seem related; but once the socio-economic profile of students and schools are taken into consideration, the relationship weakens, since privileged students are more likely to attend schools that compete for enrolment (Tables IV.2.4b and IV.2.4c in *PISA 2009 Results Volume IV*). This may reflect the fact that socio-economically advantaged students, who tend to achieve higher scores, are also more likely to attend schools that compete for enrolment, even after accounting for location and attendance in private schools (Table IV.2.6 in *PISA 2009 Results Volume IV*).

Why are socio-economically advantaged students more likely to attend schools of their choice? To understand differences in how parents choose schools for their children, PISA asked a series of questions regarding school choice in the questionnaire for parents that was distributed in eight OECD countries (no data from parents are available for the United States). On average, socio-economically disadvantaged parents are over 13 percentage points more likely than advantaged parents to report that they considered "low expenses" and "financial aid" to be very important determining factors in choosing a school (Table IV.2.7 in *PISA 2009 Results Volume IV*). While parents from all backgrounds cite academic achievement as an important consideration when choosing a school for their children, socio-economically advantaged parents are, on average, 10 percentage points more likely than disadvantaged parents to cite that consideration as "very important". It is possible that there can be differences in the parent's reasons due to socio-economic status because some of the priorities are already met in schools available to advantaged parents. Still, these differences suggest that socio-economically disadvantaged parents believe that they have more limited choices of schools for their children because of financial constraints. If children from socio-economically disadvantaged backgrounds cannot attend high-performing schools because of financial constraints, then school systems that offer parents more choice of schools for their children will necessarily be less effective in improving the performance of all students.

Public and private schools

School education takes place mainly in public schools. Nevertheless, with an increasing variety of educational opportunities, programmes and providers, governments are forging new partnerships to mobilise resources for education and to design new policies that allow all stakeholders to participate more fully and share costs and benefits more equitably. Privately provided education is not only a way of mobilising resources from a wider range of funding sources, it is sometimes also considered a way of making education more cost-effective. Publicly financed schools are not necessarily also publicly managed. Instead, governments can transfer funds to public and private educational institutions according to various allocation mechanisms. Indeed, publicly funded private schools are the most common model of private education in OECD countries (see section on school choice, above).

Across OECD countries, 15% of students are enrolled in privately managed schools that are either privately or government funded, although in many countries government authorities retain significant control over these schools, including the power to shut down non-performing schools. Enrolment in privately managed schools exceeds 50% of 15-year-old students in the Netherlands, Ireland and Chile, and between 35% and 40% in Australia and Korea. In contrast, in Turkey, Iceland and Norway, more than 98% of students attend schools that are publicly managed (Table IV.3.9 in *PISA 2009 Results Volume IV*).

On average across OECD countries, privately managed schools show a performance advantage of 30 score points on the PISA reading scale (in the United States, that advantage reaches 65 score points). However, once the socio-economic background of students and schools is accounted for, public schools come out with a slight advantage of seven score points, on average across OECD countries (in the United States, public and privately managed schools do not show a difference in performance once the socio-economic background is accounted for).

Selection of students into schools, grades and programmes

While teaching and learning are at the heart of schooling, they are supported by a complex organisation responsible for everything from selecting and admitting students to schools and classrooms, to evaluating their progress, formulating curricula, promoting successful approaches to teaching and learning, creating incentives to motivate students and teachers and deciding on the distribution of financial, material and human resources – all with the aim of providing quality education. This section looks at how school systems are organised to allocate students to programmes, schools and classes.

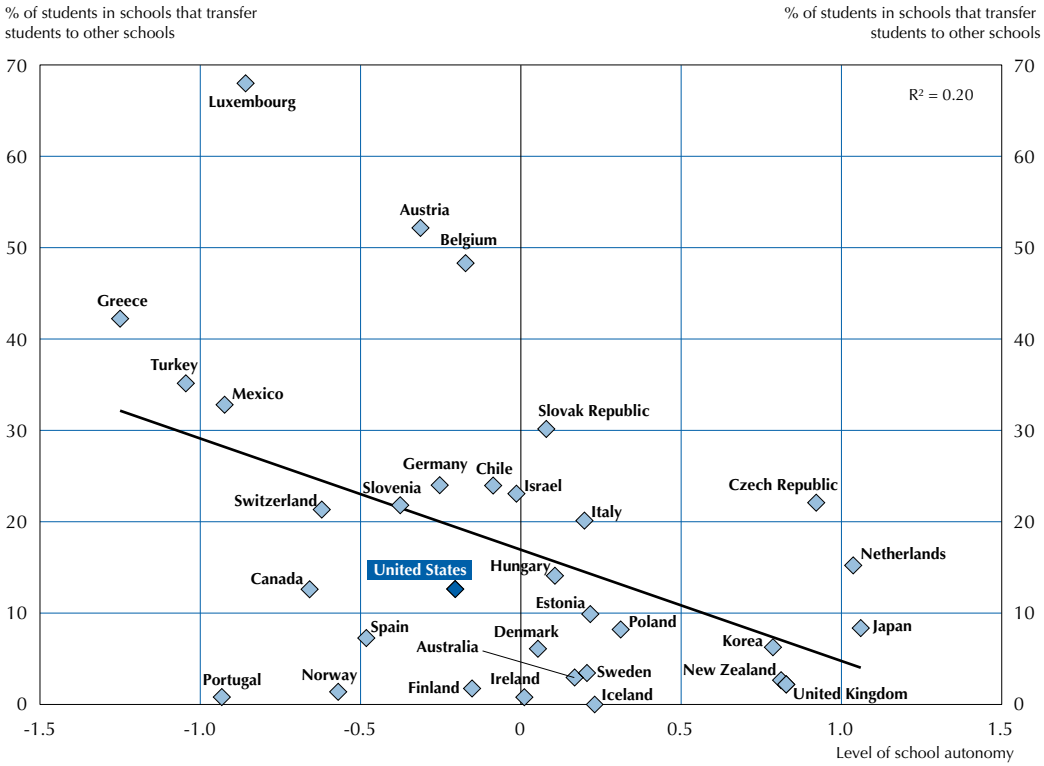
In the high-performing benchmark countries of this volume, it is the responsibility of schools and teachers to engage constructively with the diversity of student interests, capacities and socio-economic contexts, without having the option of making students repeat the school year or transferring them to educational tracks or school types with lower performance requirements. The data from PISA show that creating homogeneous schools and/or classrooms through selection is unrelated to the average performance of education systems, but clearly associated with larger variation in student achievement and a significantly larger impact of socio-economic background on learning outcomes. In particular, the earlier in the student's career the selection occurs, the greater the impact of socio-economic background on learning outcomes. That suggests that selection tends to reinforce inequities as students from disadvantaged backgrounds tend to be exposed to lower quality learning opportunities when compared to their peers from more advantaged socio-economic backgrounds (Figure IV.2.1 in *PISA 2009 Results Volume IV*).

PISA data also show grade repetition to be not only negatively related to equity but also negatively related to the average performance of education systems. That is, school systems with high grade repetition rates tend to also be school systems with lower student performance. Moreover, the more schools group students by ability across all subjects, and the more frequently schools transfer students to other schools because of students' low academic achievement, behavioural problems or special learning needs, the lower the school systems' overall performance, even after accounting for national income. While transferring difficult students out of a school may be advantageous to the school, it seems to relate negatively to the performance of the education system as a whole, and to larger performance differences between schools (Figure IV.2.1a in *PISA 2009 Results Volume IV*). School transfers may hurt student achievement because changing schools implies a loss of social capital inasmuch students have limited access to the resources that are shared in the school they are moving out of and need to recreate support and friendship networks. Furthermore, when transfers are motivated by behavioural problems, low academic achievement and special learning needs, students that are transferred out are more likely to be received by schools with a higher prevalence of similar students. Students that are transferred for these reasons not only pay the cost in terms of lost social capital, but are also less likely to benefit from higher-achieving peers. Also, in systems where transferring students or grade repetition is commonplace, teachers and the school community have an incentive

to evade problems by transferring students, rather than committing effort and resources to solving the underlying problems. They also tend to have more autonomy to adapt the learning environment in their schools (Figure 2.13). Equally important, a higher rate of student transfers also seems to be related to greater socio-economic inequities.

■ Figure 2.13 ■

School systems with low transfer rates tend to give more autonomy to schools to determine curricula and assessments



Note: The level of school autonomy is measured by the index of school responsibility for curriculum and assessment. Positive values indicate greater autonomy.
Source: OECD, *PISA 2009 Database,* Tables IV.3.3a and IV.3.6.
StatLink http://dx.doi.org/10.1787/888932366636

PISA classifies school systems attended by 15-year-old students into 12 groups according to the policies and practices they adopt concerning differentiation (Figure IV.3.2 in *PISA 2009 Results Volume IV*).[14]

Together with 12 other OECD countries, the United States is characterised by relatively low levels of formal differentiation. Students are generally not formally streamed, schools are not selective in their admissions process, and students usually do not repeat grades and few tend to be transferred to other schools. However, there is a high prevalence of informal streaming and tracking within schools in the United States, often starting in the early grades and particularly so in high schools (*e.g.* Advanced Placement courses, honours courses, etc.), which is not accounted for by this indicator. In addition, as shown above, there is also considerable socio-economic segregation between schools in the United States. And those few schools in the United States that do show high rates of grade repetition or schools transferring students with low performance or behavioural problems tend to perform more poorly and tend to be socio-economically disadvantaged schools (Tables IV.2.2b and IV.2.2c in *PISA 2009 Results Volume IV*).

School systems in six other OECD countries stratify students into different programmes based on students' academic performance, usually before they are 15 years old. Grade repetition is not common in these school systems, nor is horizontal differentiation at the school level. In five other OECD countries, school systems also provide differentiation at the system level. These school systems are characterised by their use of streaming and early selection into these programmes based on students' academic performance, but they generally do not use grade repetition or school-level differentiation.

Countries whose school systems use grade-repetition policies and similar devices to create homogeneous learning environments can be divided into two groups. While both groups make limited use of school-level horizontal differentiation, they differ in the extent to which they use vertical differentiation at the system level. While one system uses vertical differentiation and streaming of students into educational programmes (two OECD countries and three partner countries and economies), the other uses vertical differentiation as the primary and almost only form of selection and distributing students (one OECD country and four partner countries and economies).

In sum, the data suggest that in most of the countries that performed well in PISA, it is the primary responsibility of schools and teachers to engage constructively with the diversity of student interests, capacities and socio-economic contexts, without having the option of making students repeat the school year, or transferring them to educational tracks or school types with lower performance requirements. As shown in the subsequent chapters of this volume, many of the benchmark countries have developed elaborate support systems to foster the motivation of *all* students to become independent and lifelong learners. They tend to train teachers to be better at diagnosing learning difficulties so that they can be addressed through personalised instruction methods. They also help individual teachers to become aware of specific weaknesses in their own practices, which often means not just creating awareness of what they do, but also changing the underlying mindset. In addition, they seek to provide their teachers with an understanding of specific best practices and encourage teachers to make the necessary changes with a variety of incentives that goes well beyond material rewards. As noted above, the personalisation in these countries is provided in flexible learning pathways through the education system, rather than by establishing individualised goals or institutional tracking, which have often been shown to lower performance expectations for students and tend to provide easy ways for teachers and schools to defer, rather than solve, problems.

ASSESSMENT AND ACCOUNTABILITY ARRANGEMENTS

Educational standards

Fifteen-year-olds in the United States usually rate themselves comparatively highly in academic performance in PISA, even if they did not do well comparatively. This may be partly due to culture, but one interpretation is also that students are being commended for work that would not be acceptable in high-performing education systems. One trend across countries over recent years has been efforts to articulate the expectations that societies have in relation to learning outcomes and to translate these expectations into educational goals and standards. The approaches to standard-setting that OECD countries have pursued range from defining broad educational goals to formulating concise performance expectations in well-defined subject areas.

Educational standards have influenced many OECD education systems in various ways, helping them to: establish rigorous, focused and coherent content at all grade levels; reduce overlap in curricula across grades; reduce variation in implemented curricula across classrooms; facilitate co-ordination of various policy drivers, ranging from curricula to teacher training; and reduce inequity in curricula across socio-economic groups. The move by states to establish "common core standards" in the United States is a similar step that could address the current problem of widely discrepant state standards and cut scores that have led to non-comparable results. These discrepancies often mean that a school's fate depends more than anything else on where it is located and, perhaps even more important, that students across the United States are not equally well prepared to compete in the United States labour market.

Examinations

Setting performance standards has, in turn, led to the establishment of accountability systems. As discussed in the 2009 edition of *OECD's Education at a Glance* over the past decade, assessments of student performance have become common in many OECD countries – and often the results are widely reported and used in both public and specialised debate. However, the rationale for assessments and the nature of the instruments used vary greatly within and across countries. Methods employed in OECD countries include different forms of external assessment, external evaluation or inspection, and schools' own quality assurance and self-evaluation efforts. For students, tests may be the motivation needed to work harder. For teachers, student-based standardised assessments can provide information regarding the learning needs of students and may be used to personalise learning opportunities accordingly.

One aspect relating to accountability systems concerns the existence of standards-based external examinations. These are examinations that focus on a specific school subject and assess a major portion of what students who study this subject are expected to know or be able to do. Essentially, they define performance relative to an external standard, not relative to other students in the classroom or school. These examinations usually have a direct impact on students' education – and even on their futures – and may thus motivate students to invest greater efforts into learning. Other standardised tests, which may be voluntary and implemented by schools, often have only indirect

consequences for students. For teachers, standardised assessments can provide information on students' learning needs and can be used to tailor their instruction accordingly. In some countries, such as Brazil, Hungary, Italy, Malaysia, Mexico, Poland and the Slovak Republic, such tests are also used to determine teachers' salaries or to guide professional development (for data, see the 2009 edition of *Education at a Glance*). At the school level, information from standardised tests can be used to determine the allocation of additional resources, and what interventions are required to establish performance targets and monitor progress.

Across OECD countries, students in school systems that require standards-based external examinations perform, on average, over 16 points higher than those in school systems that do not use such examinations (Figure IV.2.6a in *PISA 2009 Results Volume IV*).

Among OECD countries, in the Czech Republic, Denmark, Estonia, Finland, France, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Poland, the Slovak Republic, Slovenia, Turkey and the United Kingdom, standards-based external examinations exist throughout the systems for students attending secondary school. In Australia, they cover 81% of secondary students, in Canada 51% and in Germany 35%. In Austria, Belgium, Chile, Greece, Mexico, Portugal, Spain, Sweden and Switzerland, such examinations do not exist or exist only in minor parts of the system (Table IV.3.11 in *PISA 2009 Results Volume IV*).

ASSESSMENT POLICIES AND PRACTICES

In PISA 2009, school principals were asked to report the types and frequency of assessments used: standardised tests, teacher-developed tests, teachers' judgemental ratings, student portfolios or student assignments. An average of 76% of students in OECD countries are enrolled in schools that use standardised tests. Standardised tests are relatively uncommon in Slovenia, Belgium, Spain, Austria and Germany, where less than half of students attend schools that use standardised tests for assessments. In contrast, the use of standardised tests is practically universal in Luxembourg, Finland, Korea, the United States, Poland, Denmark, Sweden and Norway, where over 95% of students attend schools that use this assessment at least once a year (Table IV.3.10 in *PISA 2009 Results Volume IV*).

The purposes of assessments vary greatly across countries. At the school level, these assessments can be used by schools to compare themselves to other schools, to monitor progress, or to make decisions about instruction. Some 59% of students across OECD countries are in schools that use achievement data to compare their students' achievement levels with those in other schools or against regional/national benchmarks. This practice is most common in the United States, New Zealand and the United Kingdom, where over 90% of students attend schools that use achievement data for comparative purposes. In Belgium, Japan, Austria, Spain and Greece, less than one-third of students attend schools that use achievement information this way (Table IV.3.12 in *PISA 2009 Results Volume IV*).

It is more common for schools to use achievement information to monitor school progress from year to year: on average across OECD countries, some 77% of students are in schools that do so. In 21 countries, more than 80% of students attend schools that use achievement data this way. Only in Denmark, Luxembourg, Switzerland and Austria do less than 50% of students attend schools that use achievement data to monitor progress.

Data on student achievement can also be used to identify aspects of instruction or the curriculum that could be improved. Across OECD countries, 77% of students are in schools whose principals reported doing so, and over 90% of students in New Zealand, the United States, the United Kingdom, Iceland, Poland, Mexico, Chile, Spain and Israel attend schools whose principals reported using achievement data in this way. Curriculum and instructional assessment using achievement data is less common in Greece and Switzerland, where less than 50% of students attend schools that use achievement data this way.

In contrast to standards-based external examinations, PISA does not show the prevalence of standardised tests to be systematically related to performance (Figure IV.2.6b in *PISA 2009 Results Volume IV*). This may be because, in part, the content and use of standardised tests vary considerably across schools and systems. However, education systems with a higher prevalence of standardised tests tend to show smaller socio-economic inequalities between schools and consequently show a smaller impact of school socio-economic background on performance (Table IV.2.10 in *PISA 2009 Results Volume IV*). The same holds for the use of assessment data to identify aspects of instruction or the curriculum that could be improved and the high proportions of schools where achievement data is tracked over time by administrative authorities.

PISA arranges OECD countries into four groups sharing similar profiles based on two dimensions (Figure 2.14): whether achievement data are used for various benchmarking and information purposes; and whether achievement data are used to make decisions that affect the school The idea is that school systems that use achievement data for benchmarking and information purposes are more likely to use this data to compare themselves with other schools,

monitor progress across time, have their progress tracked by administrative authorities, make their achievement data public, and provide parents with their child's achievement benchmarked to national or regional populations. School systems that use achievement data for decision making are more likely to use achievement data to determine the allocation of resources, make curricular decisions, and evaluate teachers' performance.

A first group of countries, composed of 16 OECD countries, including the United States, tend to use achievement data for benchmarking and information purposes and also for decisions that affect the school.

Four OECD countries use achievement data for benchmarking and information, but not for decisions affecting the school.

A third group, comprising four OECD countries, uses achievement data for decisions affecting the school, but not for benchmarking and information.

The fourth group, composed of nine OECD countries, is less likely to have schools that use achievement data for either for benchmarking and information or for decision making.

Some of the factors underlying this classification are examined in greater detail below.

■ Figure 2.14 ■

How school systems use student assessments

		Infrequent use of assessment or achievement data for benchmarking and information purposes	**Frequent use of assessment or achievement data for benchmarking and information purposes**
		Provide comparative information to parents: 32%	**Provide comparative information to parents: 64%**
		Compare the school with other schools: 38%	**Compare the school with other schools: 73%**
		Monitor progress over time: 57%	**Monitor progress over time: 89%**
		Post achievement data publicly: 20%	**Post achievement data publicly: 47%**
		Have their progress tracked by administrative authorities: 46%	**Have their progress tracked by administrative authorities: 79%**
Infrequent use of assessment or achievement data for decision making	**Make curricular decisions: 60% Allocate resources: 21% Monitor teacher practices: 50%**	Austria, Belgium,[1] Finland,[2] Germany, Greece, Ireland, Luxembourg, Netherlands,[1] Switzerland,[1] Liechtenstein	Hungary, Norway,[2] Turkey, Montenegro, Tunisia, Slovenia
Frequent use of assessment or achievement data for decision making	**Making curricular decisions: 88% Allocating resources: 40% Monitor teacher practices: 65%**	Denmark, Italy, Japan,[2] Spain, Argentina, Macao-China, Chinese Taipei, Uruguay	Australia,[1] Canada,[2] Chile, Czech Republic, Estonia,[2] Iceland,[2] Israel, Korea,[2] Mexico, New Zealand,[1] Poland,[1] Portugal, Slovak Republic, Sweden, United Kingdom, **United States,** Albania, Azerbaijan, Brazil, Bulgaria, Colombia, Croatia, Dubai (UAE), Hong Kong-China,[2] Indonesia, Jordan, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Panama, Peru, Qatar, Romania, Russian Federation, Shanghai-China,[1] Singapore,[1] Thailand, Trinidad and Tobago, Serbia

Note: The estimates in the grey cells indicate the average values of the variables used in latent profile analysis in each group. See Annex A5 for technical details.
1. Perform higher than the OECD average in reading.
2. Perform higher than the OECD average in reading and where the relationship between students' socio-economic background and reading performance is weaker than the OECD average.
Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932366636

Accountability arrangements

While performance data in the United States are often used for punitive accountability purposes, other countries tend to give greater weight to guide intervention, reveal best practices and identify shared problems. Where school performance is systematically assessed, the primary purpose is often not to support contestability of public services or market mechanisms in the allocation of resources; rather it is to reveal best practices and identify common problems in order to encourage teachers and schools to develop more supportive and productive learning environments. To achieve this, many education systems try to develop assessment and accountability systems that include progressive learning targets that explicitly describe the steps that learners follow as they become more proficient, and define what a student should know and be able to do at each level of advancement. The trend among OECD countries here is leading towards multi-layered, coherent assessment systems, from classrooms to schools to regional to national to

international levels, that: support improvement of learning at all levels of the system; are increasingly performance-based; add value for teaching and learning by providing information that can be acted on by students, teachers, and administrators; and are part of a comprehensive and well-aligned learning system that includes syllabi, associated instructional materials, matching exams, professional scoring and teacher training.

PISA 2009 collected data on the nature of accountability systems and the ways in which the resulting information was used and made available to various stakeholders and the public at large (Table IV.3.13 in *PISA 2009 Results Volume IV*). Some school systems make achievement data public to make stakeholders aware of the comparative performance of schools and, where school-choice programmes are available, to make parents aware of the choices available to them. Across OECD countries, an average of 37% of students attend schools that make achievement data available to the public; but in Belgium, Finland, Switzerland, Japan, Austria and Spain, less than 10% of students attend schools that make their data publicly available. In the United States and the United Kingdom, by contrast, more than 80% of students attend schools that make student achievement data publicly available. In seven OECD countries and nine partner countries and economies, schools whose school principals reported that student achievement data are posted publicly perform better than schools whose achievement data is not made publicly available, before accounting for the socio-economic and demographic background of students and schools; however no such relationship is seen in the United States. Moreover, since in most of the countries the schools that post achievement data publicly tend to be socio-economically advantaged schools, this performance advantage is often not observed once socio-economic background is accounted for (Figure IV.2.6b in *PISA 2009 Results Volume IV*).

School-level achievement data is often tracked over time by administrative authorities: across OECD countries, an average of 66% of students attend schools whose achievement data are tracked over time by administrative authorities. In 25 OECD countries, among them the United States, with the highest percentage (96%), more than 50% of students attend schools whose achievement data is so tracked (Table IV.3.13 in *PISA 2009 Results Volume IV*).

Achievement data can also be used to determine how resources are distributed. Across OECD countries, an average of 33% of students attend schools that use achievement data in this way. In Israel, Chile and the United States, more than 70% of students attend schools in which the principals reported that instructional resources are allocated according to the school's achievement data. This practice is least common in Iceland, Greece, Japan, Czech Republic and Finland, where less than 10% of students attend schools whose achievement data are used this way.

Some school systems make achievement data available to parents in the form of report cards and by sending teacher-formulated assessments home. Some school systems also provide information on the students' academic standing compared with other students in the country or region or within the school (Table IV.3.14 in *PISA 2009 Results Volume IV*). Across OECD countries, an average of 52% of students attend schools that use achievement data relative to national or regional benchmarks and/or as a group relative to students in the same grade in other schools; but in 17 countries, over 50% of students attend schools that do not provide any information regarding the academic standing of students in either of these ways. In contrast, in Sweden, the United States, Korea, Chile, Norway and Turkey, more than 80% of students attend schools that provide parents with this information compared with national or regional student populations.

Achievement data from students can also be used to monitor teacher practices, and an average of 59% of students across OECD countries attend schools whose principals reported doing so. Over 80% of students in Poland, Israel, the United Kingdom, Turkey, Mexico, Austria and the United States attend schools whose principals reported using achievement data to monitor teacher practices. Many schools across OECD countries complement this information with qualitative assessments, such as teacher peer reviews, assessments for school principals or senior staff, or observations by inspectors or other persons external to the school. Most schools across OECD countries use either student-derived, direct observations or reviews to monitor teachers, but school principals in Finland rarely use either to monitor teacher practices. Some 18% of students in Finland attend schools that use student assessments to monitor teachers; around 20% of students attend schools that use more qualitative and direct methods to monitor teacher practices; and only 2% of students attend schools that monitor teacher practices using observations of classes by inspectors or other persons external to the school (Table IV.3.15 in *PISA 2009 Results Volume IV*). There has also been a growing trend among OECD countries to use outstanding performance in teaching as criteria for base salary and additional payments awarded to teachers in public institutions. While in 2002 such practices were used in 38% of the 29 countries with available data, in 2008, 45% of countries with available data used such practices (Table D.3.3 in the 2010 edition of OECD's *Education at a Glance*).

RESOURCES

Effective school systems require the right combination of trained and talented personnel, adequate educational resources and facilities, and motivated students ready to learn. But performance on international comparisons cannot simply be tied to money, since only Luxembourg spends more per student than the United States. The results for the United States reflect rather a range of inefficiencies. That point is reinforced by the fact that, in international comparisons of children in primary school (TIMSS and PIRLS), the United States does relatively well by international standards, which, given the country's wealth, is what would be expected. The problem is that as they get older, children make less progress each year than children in the best-performing countries do. As discussed in the section *Equity in access to resources* above, and illustrated, in particular, in the country chapters on Canada, Finland and Shanghai-China, it is noteworthy that spending patterns in many of the world's successful education systems are markedly different from those in the United States. These countries invest money where the challenges are greatest, rather than making the resources that are devoted to schools dependent on the wealth of the local communities in which schools are located, and they put in place incentives and support systems that attract the most talented school teachers into the most difficult classrooms. They have often reformed inherited, traditional and bureaucratic systems of recruiting and training teachers and leaders, of paying and rewarding them and of shaping their incentives, both short-term and long-term.

Research usually shows a weak relationship between educational resources and student performance, with more variation explained by the quality of human resources (*i.e.* teachers and school principals) than by material and financial resources, particularly among industrialised nations. The generally weak relationship between resources and performance observed in past research is also seen in PISA. At the level of the education system, and net of the level of national income, the only type of resource that PISA shows to be correlated with student performance is the level of teachers' salaries relative to national income (Figure IV.2.8 in *PISA 2009 Results Volume IV*). Teachers' salaries are related to class size in that if spending levels are similar, school systems often make trade-offs between smaller classes and higher salaries for teachers. The findings from PISA suggest that systems prioritising higher teacher salaries over smaller classes tend to perform better. The lack of correlation between the level of resources and performance among school systems does not mean that resource levels do not affect performance at all. Rather, it implies that, given the variation in resources observed in PISA, they are unrelated to performance or equity. A school system that lacks teachers, infrastructure and textbooks will almost certainly perform at lower levels; but given that most school systems in PISA appear to satisfy the minimum resource requirements for teaching and learning, the lack of a relationship between many of the resource aspects and both equity and performance may result simply from a lack of sufficient variation among OECD countries.

Many of the high-performing countries share a commitment to professionalised teaching, in ways that imply that teachers are are accorded the same status as other highly-regarded professions. The subsequent chapters show that, to achieve this, countries often do four things well: first, they attract the best graduates to become teachers, realising that the quality of an education system cannot exceed the quality of its teachers. For example, the benchmark country, Finland, recruits its teachers from the top 10% of graduates. Second, they develop these teachers into effective instructors, through, for example, coaching classroom practice, moving teacher training into the classroom, developing strong school leaders and enabling teachers to share their knowledge and spread innovation. Singaporean teachers, for example, get 100 hours of fully paid professional development training each year; teachers in Shanghai-China get 240 hours over a five-year period. Third, countries put in place incentives and differentiated support systems to ensure that every child is able to benefit from excellent instruction. The image here is of teachers who use data to evaluate the learning needs of their students, and are constantly expanding their repertoire of pedagogic strategies to address the diversity of students' interests and abilities. Such systems also often adopt innovative approaches to staffing classrooms.

It is also important that, within school systems, much of the relationship between school resources and student performance is closely associated with schools' socio-economic and demographic profiles. This suggests the need for more consideration on how to distribute resources for schools more equitably. Across OECD countries, and considering aspects that relate to class size, instruction time, participation in after-school lessons, availability of extra-curricular activities, and the school principal's perception of teacher shortages and a lack of material resources that adversely affects instruction, only 5% of the variation in student performance is attributable solely to the differences in the educational resources available to schools. In contrast, 18% of the variation in student performance is attributable jointly to spending on education and to socio-economic and demographic background (Figure IV.2.9 and Table IV.2.12a in *PISA 2009 Results Volume IV*). Improving equity will thus require considering the disparities in resources among schools.

In other words, while much of the variation in student performance cannot be predicted solely by levels of resources, resources are closely related to the socio-economic composition of individual schools, such that socio-economically advantaged students attend schools with better resources. Whether and how long students are enrolled in pre-primary education is also an important resource consideration. Many of the inequities that exist within school systems are already present once students enter formal schooling and persist as students' progress through school. Earlier entrance into the school system may reduce educational inequities, since participation is then universal. On average across OECD countries, 72% of today's 15-year-old students reported in PISA that they had attended pre-primary education for more than one year when they were children. Attendance in more than one year of pre-primary education was practically universal in Japan, the Netherlands, Hungary, Belgium, Iceland and France, where over 90% of 15-year-old students reported that they had attended pre-primary school for more than one year. More than 90% of students in 27 OECD countries had attended pre-primary school for at least some time, and 98% or more of students in Japan, Hungary, France and the United States reported having done so. Pre-primary education is rare in Turkey, where less than 30% of 15-year-olds had attended pre-primary school for at least a year. More than one year of pre-primary education is uncommon in Chile, Ireland, Canada and Poland, where less than 50% of students had attended pre-primary school for that length of time (Table IV.3.18 in *PISA 2009 Results Volume IV*).

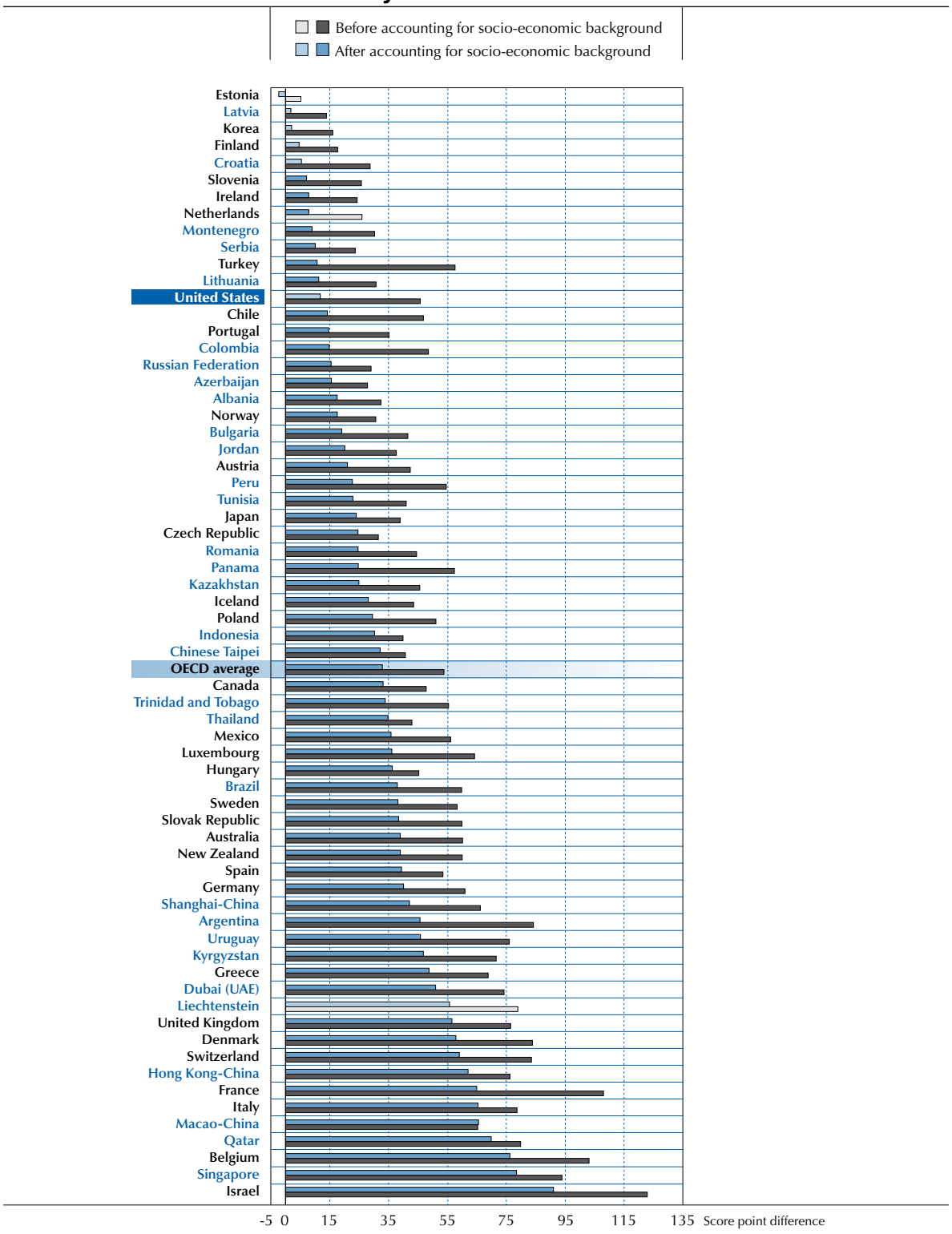
PISA 2009 results show that, in general, students who had attended pre-primary education perform better in reading at the age of 15 than students who had not (Figure 2.15, Figure II.5.9 and Table II.5.5 in *PISA 2009 Results Volume II*). In 32 OECD countries, students who had attended pre-primary education for more than one year outperformed students who had not attended pre-primary education at all, in many countries by the equivalent of well over a school year. This finding remains unchanged in most countries even after the socio-economic background of students is accounted for. However, across countries, there is considerable variation in the impact of students' attendance in pre-primary education on their 15-year-old reading performance. Among OECD countries, in Israel, Belgium, Italy and France, students who had attended pre-primary education for more than one year perform at least 64 score points higher in reading than students who had not attended pre-primary education, which corresponds to the equivalent of roughly one-and-a-half school years. This was the case even after students' socio-economic background was accounted for. On the other hand, in Estonia, Finland, the United States and Korea, there is no marked difference in reading scores between those students who had attended pre-primary education (for more than one year) and those who hadn't after the socio-economic background of students is accounted for. In the United States, the performance advantage of students who had attended pre-primary education for one year or less is 33 score points on the PISA reading scale – roughly the equivalent of one school year at age 15 – and the advantage of students who had attended pre-primary education for one year or more is 46 score points. However, in the United States, a large part of that advantage is explained by socio-economic characteristics, that is, students from more privileged socio-economic backgrounds tend to take greater advantage of pre-primary education. While these results underline the importance of pre-primary education, international comparisons of children in primary school show that the United States does well by international standards. The problem is that as they get older, these children make less progress each year than children in many other countries. In other words, more pre-primary education can only be part of the solution.

One hypothesis to explain the variability in the impact of pre-primary education on later school performance is the quality of pre-primary education. This hypothesis is supported by the fact that the impact of pre-primary education attendance on performance tends to be greater in education systems with a longer duration of pre-primary education, smaller pupil-to-teacher ratio in pre-primary education, or higher public expenditure per pupil at the pre-primary education level (Table II.5.6 in *PISA 2009 Results Volume II*).

When the impact of pre-primary education attendance on reading performance at age 15 is compared between different socio-economic backgrounds, no significant difference is found between students from socio-economically disadvantaged and advantaged backgrounds (Table II.5.8 in *PISA 2009 Results Volume II*). Socio-economically disadvantaged and advantaged students benefit equally from pre-primary education attendance in 31 OECD countries and 25 partner countries and economies. The United States is the only OECD country where PISA shows evidence that disadvantaged students benefit more from pre-primary education. Part of the difference in the impact of attendance in pre-primary education on the performance of students from different socio-economic backgrounds may be due to the fact that many other factors apart from attendance in pre-primary education (*e.g.* education in and out of school that students received between the ages of 6 and 15) may influence 15-year-olds' performance.

■ Figure 2.15 ■

Performance difference between students who had attended pre-primary school for more than one year and those who had not



Note: Score point differences that are statistically significant are marked in a darker tone.
Countries are ranked in ascending order of the score point difference between students who report having attended pre-primary school (ISCED 0) for more than one year and those without pre-primary school attendance after accounting for socio-economic background.
Source: OECD, *PISA 2009 Database,* Table II.5.5.
StatLink http://dx.doi.org/10.1787/888932366636

When the impact of pre-primary education on performance at age 15 is compared between students with immigrant backgrounds and native students, a significant difference is found in some countries (Table II.5.9 in *PISA 2009 Results Volume II*). In Finland, Ireland, Canada and the partner country Qatar, the impact of attendance in pre-primary education on performance is greater for immigrant students than for native students.

In countries that spend more public resources on pre-primary education per student, students with immigrant backgrounds tend to benefit more from pre-primary education than native students (Table II.5.10 in *PISA 2009 Results Volume II*). However, other measures of quality of pre-primary education, such as a higher enrolment rate for pre-primary education, a longer duration of pre-primary education, and smaller pupil-to-teacher ratio in pre-primary education are more closely related to the performance advantage observed by PISA.

The following chapters will describe some of the success stories of high-performing and rapidly improving education systems in detail before the concluding chapter lays out possible lessons for the United States.

■ Figure 2.16 ■

Comparing countries' performance in reading

Statistically significantly **above** the OECD average
Not statistically significantly different from the OECD average
Statistically significantly **below** the OECD average

Mean	Comparison country	Countries whose mean score is NOT statistically significantly different from that of the comparison country
556	Shanghai-China	
539	Korea	Finland, Hong Kong-China
536	Finland	Korea, Hong Kong-China
533	Hong Kong-China	Korea, Finland
526	Singapore	Canada, New Zealand, Japan
524	Canada	Singapore, New Zealand, Japan
521	New Zealand	Singapore, Canada, Japan, Australia
520	Japan	Singapore, Canada, New Zealand, Australia, Netherlands
515	Australia	New Zealand, Japan, Netherlands
508	Netherlands	Japan, Australia, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany
506	Belgium	Netherlands, Norway, Estonia, Switzerland, Poland, United States, Liechtenstein
503	Norway	Netherlands, Belgium, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France
501	Estonia	Netherlands, Belgium, Norway, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
501	Switzerland	Netherlands, Belgium, Norway, Estonia, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
500	Poland	Netherlands, Belgium, Norway, Estonia, Switzerland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
500	Iceland	Netherlands, Norway, Estonia, Switzerland, Poland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Hungary
500	**United States**	Netherlands, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
499	Liechtenstein	Netherlands, Belgium, Norway, Estonia, Switzerland, Poland, Iceland, United States, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
497	Sweden	Netherlands, Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary, Portugal
497	Germany	Netherlands, Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary
496	Ireland	Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, France, Chinese Taipei, Denmark, United Kingdom, Hungary, Portugal
496	France	Norway, Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, Chinese Taipei, Denmark, United Kingdom, Hungary, Portugal
495	Chinese Taipei	Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Denmark, United Kingdom, Hungary, Portugal
495	Denmark	Estonia, Switzerland, Poland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, United Kingdom, Hungary, Portugal
494	United Kingdom	Estonia, Switzerland, Poland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, Hungary, Portugal
494	Hungary	Estonia, Switzerland, Poland, Iceland, United States, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Portugal
489	Portugal	Sweden, Ireland, France, Chinese Taipei, Denmark, United Kingdom, Hungary, Macao-China, Italy, Latvia, Slovenia, Greece
487	Macao-China	Portugal, Italy, Latvia, Greece
486	Italy	Portugal, Macao-China, Latvia, Slovenia, Greece, Spain
484	Latvia	Portugal, Macao-China, Italy, Slovenia, Greece, Spain, Czech Republic, Slovak Republic
483	Slovenia	Portugal, Italy, Latvia, Greece, Spain, Czech Republic
483	Greece	Portugal, Macao-China, Italy, Latvia, Slovenia, Spain, Czech Republic, Slovak Republic, Croatia, Israel
481	Spain	Italy, Latvia, Slovenia, Greece, Czech Republic, Slovak Republic, Croatia, Israel
478	Czech Republic	Latvia, Slovenia, Greece, Spain, Slovak Republic, Croatia, Israel, Luxembourg, Austria
477	Slovak Republic	Latvia, Greece, Spain, Czech Republic, Croatia, Israel, Luxembourg, Austria
476	Croatia	Greece, Spain, Czech Republic, Slovak Republic, Israel, Luxembourg, Austria, Lithuania
474	Israel	Greece, Spain, Czech Republic, Slovak Republic, Croatia, Luxembourg, Austria, Lithuania, Turkey
472	Luxembourg	Czech Republic, Slovak Republic, Croatia, Israel, Austria, Lithuania
470	Austria	Czech Republic, Slovak Republic, Croatia, Israel, Luxembourg, Lithuania, Turkey
468	Lithuania	Croatia, Israel, Luxembourg, Austria, Turkey
464	Turkey	Israel, Austria, Lithuania, Dubai (UAE), Russian Federation
459	Dubai (UAE)	Turkey, Russian Federation
459	Russian Federation	Turkey, Dubai (UAE)
449	Chile	Serbia
442	Serbia	Chile, Bulgaria
429	Bulgaria	Serbia, Uruguay, Mexico, Romania, Thailand, Trinidad and Tobago
426	Uruguay	Bulgaria, Mexico, Romania, Thailand
425	Mexico	Bulgaria, Uruguay, Romania, Thailand
424	Romania	Bulgaria, Uruguay, Mexico, Thailand, Trinidad and Tobago
421	Thailand	Bulgaria, Uruguay, Mexico, Romania, Trinidad and Tobago, Colombia
416	Trinidad and Tobago	Bulgaria, Romania, Thailand, Colombia, Brazil
413	Colombia	Thailand, Trinidad and Tobago, Brazil, Montenegro, Jordan
412	Brazil	Trinidad and Tobago, Colombia, Montenegro, Jordan
408	Montenegro	Colombia, Brazil, Jordan, Tunisia, Indonesia, Argentina
405	Jordan	Colombia, Brazil, Montenegro, Tunisia, Indonesia, Argentina
404	Tunisia	Montenegro, Jordan, Indonesia, Argentina
402	Indonesia	Montenegro, Jordan, Tunisia, Argentina
398	Argentina	Montenegro, Jordan, Tunisia, Indonesia, Kazakhstan
390	Kazakhstan	Argentina, Albania
385	Albania	Kazakhstan, Panama
372	Qatar	Panama, Peru
371	Panama	Albania, Qatar, Peru, Azerbaijan
370	Peru	Qatar, Panama, Azerbaijan
362	Azerbaijan	Panama, Peru
314	Kyrgyzstan	

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.17 ■

Comparing countries' performance in mathematics

Statistically significantly **above** the OECD average
Not statistically significantly different from the OECD average
Statistically significantly **below** the OECD average

Mean	Comparison country	Countries whose mean score is NOT statistically significantly different from that of the comparison country
600	Shanghai-China	
562	Singapore	
555	Hong Kong-China	Korea
546	Korea	Hong Kong-China, Chinese Taipei, Finland, Liechtenstein
543	Chinese Taipei	Korea, Finland, Liechtenstein, Switzerland
541	Finland	Korea, Chinese Taipei, Liechtenstein, Switzerland
536	Liechtenstein	Korea, Chinese Taipei, Finland, Switzerland, Japan, Netherlands
534	Switzerland	Chinese Taipei, Finland, Liechtenstein, Japan, Canada, Netherlands
529	Japan	Liechtenstein, Switzerland, Canada, Netherlands, Macao-China
527	Canada	Switzerland, Japan, Netherlands, Macao-China
526	Netherlands	Liechtenstein, Switzerland, Japan, Canada, Macao-China, New Zealand
525	Macao-China	Japan, Canada, Netherlands
519	New Zealand	Netherlands, Belgium, Australia, Germany
515	Belgium	New Zealand, Australia, Germany, Estonia
514	Australia	New Zealand, Belgium, Germany, Estonia
513	Germany	New Zealand, Belgium, Australia, Estonia, Iceland
512	Estonia	Belgium, Australia, Germany, Iceland
507	Iceland	Germany, Estonia, Denmark
503	Denmark	Iceland, Slovenia, Norway, France, Slovak Republic
501	Slovenia	Denmark, Norway, France, Slovak Republic, Austria
498	Norway	Denmark, Slovenia, France, Slovak Republic, Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary
497	France	Denmark, Slovenia, Norway, Slovak Republic, Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary
497	Slovak Republic	Denmark, Slovenia, Norway, France, Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary
496	Austria	Slovenia, Norway, France, Slovak Republic, Poland, Sweden, Czech Republic, United Kingdom, Hungary, United States
495	Poland	Norway, France, Slovak Republic, Austria, Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Portugal
494	Sweden	Norway, France, Slovak Republic, Austria, Poland, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Ireland, Portugal
493	Czech Republic	Norway, France, Slovak Republic, Austria, Poland, Sweden, United Kingdom, Hungary, Luxembourg, United States, Ireland, Portugal
492	United Kingdom	Norway, France, Slovak Republic, Austria, Poland, Sweden, Czech Republic, Hungary, Luxembourg, United States, Ireland, Portugal
490	Hungary	Norway, France, Slovak Republic, Austria, Poland, Sweden, Czech Republic, United Kingdom, Luxembourg, United States, Ireland, Portugal, Spain, Italy, Latvia
489	Luxembourg	Poland, Sweden, Czech Republic, United Kingdom, Hungary, United States, Ireland, Portugal
487	**United States**	Austria, Poland, Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, Ireland, Portugal, Spain, Italy, Latvia
487	Ireland	Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Portugal, Spain, Italy, Latvia
487	Portugal	Poland, Sweden, Czech Republic, United Kingdom, Hungary, Luxembourg, United States, Ireland, Spain, Italy, Latvia
483	Spain	Hungary, United States, Ireland, Portugal, Italy, Latvia
483	Italy	Hungary, United States, Ireland, Portugal, Spain, Latvia
482	Latvia	Hungary, United States, Ireland, Portugal, Spain, Italy, Lithuania
477	Lithuania	Latvia
468	Russian Federation	Greece, Croatia
466	Greece	Russian Federation, Croatia
460	Croatia	Russian Federation, Greece
453	Dubai (UAE)	Israel, Turkey
447	Israel	Dubai (UAE), Turkey, Serbia
445	Turkey	Dubai (UAE), Israel, Serbia
442	Serbia	Israel, Turkey
431	Azerbaijan	Bulgaria, Romania, Uruguay
428	Bulgaria	Azerbaijan, Romania, Uruguay, Chile, Thailand, Mexico
427	Romania	Azerbaijan, Bulgaria, Uruguay, Chile, Thailand
427	Uruguay	Azerbaijan, Bulgaria, Romania, Chile
421	Chile	Bulgaria, Romania, Uruguay, Thailand, Mexico
419	Thailand	Bulgaria, Romania, Chile, Mexico, Trinidad and Tobago
419	Mexico	Bulgaria, Chile, Thailand
414	Trinidad and Tobago	Thailand
405	Kazakhstan	Montenegro
403	Montenegro	Kazakhstan
388	Argentina	Jordan, Brazil, Colombia, Albania
387	Jordan	Argentina, Brazil, Colombia, Albania
386	Brazil	Argentina, Jordan, Colombia, Albania
381	Colombia	Argentina, Jordan, Brazil, Albania, Indonesia
377	Albania	Argentina, Jordan, Brazil, Colombia, Tunisia, Indonesia
371	Tunisia	Albania, Indonesia, Qatar, Peru, Panama
371	Indonesia	Colombia, Albania, Tunisia, Qatar, Peru, Panama
368	Qatar	Tunisia, Indonesia, Peru, Panama
365	Peru	Tunisia, Indonesia, Qatar, Panama
360	Panama	Tunisia, Indonesia, Qatar, Peru
331	Kyrgyzstan	

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.18 ■

Comparing countries' performance in science

Statistically significantly **above** the OECD average
Not statistically significantly different from the OECD average
Statistically significantly **below** the OECD average

Mean	Comparison country	Countries whose mean score is NOT statistically significantly different from that comparison country
575	Shanghai-China	
554	Finland	Hong Kong-China
549	Hong Kong-China	Finland
542	Singapore	Japan, Korea
539	Japan	Singapore, Korea, New Zealand
538	Korea	Singapore, Japan, New Zealand
532	New Zealand	Japan, Korea, Canada, Estonia, Australia, Netherlands
529	Canada	New Zealand, Estonia, Australia, Netherlands
528	Estonia	New Zealand, Canada, Australia, Netherlands, Germany, Liechtenstein
527	Australia	New Zealand, Canada, Estonia, Netherlands, Chinese Taipei, Germany, Liechtenstein
522	Netherlands	New Zealand, Canada, Estonia, Australia, Chinese Taipei, Germany, Liechtenstein, Switzerland, United Kingdom, Slovenia
520	Chinese Taipei	Australia, Netherlands, Germany, Liechtenstein, Switzerland, United Kingdom
520	Germany	Estonia, Australia, Netherlands, Chinese Taipei, Liechtenstein, Switzerland, United Kingdom
520	Liechtenstein	Estonia, Australia, Netherlands, Chinese Taipei, Germany, Switzerland, United Kingdom
517	Switzerland	Netherlands, Chinese Taipei, Germany, Liechtenstein, United Kingdom, Slovenia, Macao-China
514	United Kingdom	Netherlands, Chinese Taipei, Germany, Liechtenstein, Switzerland, Slovenia, Macao-China, Poland, Ireland
512	Slovenia	Netherlands, Switzerland, United Kingdom, Macao-China, Poland, Ireland, Belgium
511	Macao-China	Switzerland, United Kingdom, Slovenia, Poland, Ireland, Belgium
508	Poland	United Kingdom, Slovenia, Macao-China, Ireland, Belgium, Hungary, United States
508	Ireland	United Kingdom, Slovenia, Macao-China, Poland, Belgium, Hungary, United States, Czech Republic, Norway
507	Belgium	Slovenia, Macao-China, Poland, Ireland, Hungary, United States, Czech Republic, Norway, France
503	Hungary	Poland, Ireland, Belgium, United States, Czech Republic, Norway, Denmark, France, Sweden, Austria
502	**United States**	Poland, Ireland, Belgium, Hungary, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Austria, Latvia, Portugal
500	Czech Republic	Ireland, Belgium, Hungary, United States, Norway, Denmark, France, Iceland, Sweden, Austria, Latvia, Portugal
500	Norway	Ireland, Belgium, Hungary, United States, Czech Republic, Denmark, France, Iceland, Sweden, Austria, Latvia, Portugal
499	Denmark	Hungary, United States, Czech Republic, Norway, France, Iceland, Sweden, Austria, Latvia, Portugal
498	France	Belgium, Hungary, United States, Czech Republic, Norway, Denmark, Iceland, Sweden, Austria, Latvia, Portugal, Lithuania, Slovak Republic
496	Iceland	United States, Czech Republic, Norway, Denmark, France, Sweden, Austria, Latvia, Portugal, Lithuania, Slovak Republic
495	Sweden	Hungary, United States, Czech Republic, Norway, Denmark, France, Iceland, Austria, Latvia, Portugal, Lithuania, Slovak Republic, Italy
494	Austria	Hungary, United States, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Latvia, Portugal, Lithuania, Slovak Republic, Italy, Spain, Croatia
494	Latvia	United States, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Austria, Portugal, Lithuania, Slovak Republic, Italy, Spain, Croatia
493	Portugal	United States, Czech Republic, Norway, Denmark, France, Iceland, Sweden, Austria, Latvia, Lithuania, Slovak Republic, Italy, Spain, Croatia
491	Lithuania	France, Iceland, Sweden, Austria, Latvia, Portugal, Slovak Republic, Italy, Spain, Croatia
490	Slovak Republic	France, Iceland, Sweden, Austria, Latvia, Portugal, Lithuania, Italy, Spain, Croatia
489	Italy	Sweden, Austria, Latvia, Portugal, Lithuania, Slovak Republic, Spain, Croatia
488	Spain	Austria, Latvia, Portugal, Lithuania, Slovak Republic, Italy, Croatia, Luxembourg
486	Croatia	Austria, Latvia, Portugal, Lithuania, Slovak Republic, Italy, Spain, Luxembourg, Russian Federation
484	Luxembourg	Spain, Croatia, Russian Federation
478	Russian Federation	Croatia, Luxembourg, Greece
470	Greece	Russian Federation, Dubai (UAE)
466	Dubai (UAE)	Greece
455	Israel	Turkey, Chile
454	Turkey	Israel, Chile
447	Chile	Israel, Turkey, Serbia, Bulgaria
443	Serbia	Chile, Bulgaria
439	Bulgaria	Chile, Serbia, Romania, Uruguay
428	Romania	Bulgaria, Uruguay, Thailand
427	Uruguay	Bulgaria, Romania, Thailand
425	Thailand	Romania, Uruguay
416	Mexico	Jordan
415	Jordan	Mexico, Trinidad and Tobago
410	Trinidad and Tobago	Jordan, Brazil
405	Brazil	Trinidad and Tobago, Colombia, Montenegro, Argentina, Tunisia, Kazakhstan
402	Colombia	Brazil, Montenegro, Argentina, Tunisia, Kazakhstan
401	Montenegro	Brazil, Colombia, Argentina, Tunisia, Kazakhstan
401	Argentina	Brazil, Colombia, Montenegro, Tunisia, Kazakhstan, Albania
401	Tunisia	Brazil, Colombia, Montenegro, Argentina, Kazakhstan
400	Kazakhstan	Brazil, Colombia, Montenegro, Argentina, Tunisia, Albania
391	Albania	Argentina, Kazakhstan, Indonesia
383	Indonesia	Albania, Qatar, Panama, Azerbaijan
379	Qatar	Indonesia, Panama
376	Panama	Indonesia, Qatar, Azerbaijan, Peru
373	Azerbaijan	Indonesia, Panama, Peru
369	Peru	Panama, Azerbaijan
330	Kyrgyzstan	

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932366636

■ Figure 2.19 ■

United States: Profile data

Language(s)	American English
Population	304 228 300[15]
Youth population	20.2%[16] (OECD average 18.7%)
Elderly population	12.7%[17] (OECD average 14.4%)
Growth rate	0.95%[18] (OECD 0.68%)[19]
Foreign-born population	13.6%[20] (OECD average 12.9%)
GDP per capita	USD 47 495[21] (OECD average 33 732)[22]
Economy-origin of GDP	Services: 30.8%; Other: 28.2%; Finance, insurance and real estate: 18.2%; Government and government enterprises: 13%; Manufacturing: 9.7%[23]
Unemployment/youth unemployment	5.8% (2008) [24] (OECD average 6.1%)[25] 12.8% (OECD average 13.8%)[26]
Expenditure on education	5.3% of GDP; (OECD average 5.2%) 3.7% on primary, secondary and post-secondary non-tertiary 1.2% on tertiary[27] education[28] (OECD average 3.5%; 1.2% respectively) 14.1% of total public expenditure (OECD average 13.3%) 9.9% on primary, secondary and post-secondary non-tertiary 3.3% on tertiary education[29] (OECD average 9%; 3.1% respectively)
Enrolment ratio, early childhood education	46.9%[30] (OECD average 71.5%)[31]
Enrolment ratio, primary education	98.6%[32] (OECD average 98.8%)[33]
Enrolment ratio, secondary education	80.8%[34] (OECD average 81.5%)[35]
Enrolment ratio, tertiary education	23.2%[36] (OECD average 24.9%)[37]
Students in primary education, by type of institution or mode of enrolment[38]	Public: 90.3% (OECD average 89.6%) Government-dependent private: no data[39] (OECD average 8.1%) Independent, private: 9.7% (OECD average 2.9%)
Students in lower secondary education, by type of institution or mode of enrolment[40]	Public 91.1% (OECD average 83.2%) Government-dependent private: no data[41] (OECD average 10.9%) Independent, private: 8.9% (OECD average 3.5%)
Students in upper secondary education, by type of institution or mode of enrolment[42]	Public: 91.4% (OECD avg 82%) Government-dependent private: no data[43] (OECD average 13.6%) Independent, private: 8.6% (OECD average 5.5%)
Students in tertiary education, by type of institution or mode of enrolment[44]	Tertiary type B education: Public: 81.1% Government-dependent private: no data[45] Independent-private: 18.9% (OECD average Public: 61.8% Government-dependent private: 19.2% Independent-private: 16.6%) Tertiary type A education: Public: 71.7% Government-dependent private: no data[46] Independent-private: 28.3% (OECD average Public: 77.1% Government-dependent private: 9.6% Independent-private: 15%)
Teachers' salaries	Average annual starting salary in lower secondary education: USD 35 915 (OECD average USD 30 750)[47] Ratio of salary in lower secondary education after 15 years of experience to GDP per capita: 94[48] (OECD average: 1.22)[49]
Upper secondary graduation rates	77% (OECD average 80%)[50]

StatLink http://dx.doi.org/10.1787/888932366636

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OECD (2010e), *Pathways to Success,* OECD Publishing.

OECD (2010f), *PISA 2009 Results, Volume I-V,* OECD Publishing.

Notes

1. Though rank 14 is the best estimate, due to sampling and measurement error the rank could be between 8 and 19.

2. Though rank 17 is the best estimate, due to sampling and measurement error the rank could be between 13 and 22.

3. Though rank 23 is the best estimate, due to sampling and measurement error the rank could be between 21 and 29.

4. Twenty-six per cent of US students in socio-economically disadvantaged schools performed at or above the average performance in Finland. Disadvantaged schools are defined as schools for which the *PISA index of economic, social and cultural status* is below the average of the United States, which is equal to -.0634 index points.

5. All figures shown in purchasing power parities.

6. This is measured by the *PISA index of economic, social and cultural status* of students. The index has an average of 0 and a standard deviation of 1 for OECD countries. The index value for the most disadvantaged quarter of students is -1.05 for the United States and -1.14 for the OECD average. The index value for the entire student population is 0.17 for the United States and 0.00 for the OECD average.

7. No such data are available for the United States.

8. Among the students in socio-economically disadvantaged schools, 2% of American students are in schools that compare with the average school in Finland.

9. Twenty-six per cent of US students in socio-economically disadvantaged schools performer at or above the average performance in Finland. Disadvantaged schools are defined as schools for which the *PISA index of economic, social and cultural status* is below the average of the United States, which is equal to -.0634 index points.

10. Students in the United States attending schools located in a city with between 100 000 and 1 000 000 inhabitants performed, on average, at 504 score points, students attending schools in towns with between 15 000 and 100 000 inhabitants reached 506 score points, and students attending schools located in a small town with between 3 000 and 15 000 inhabitants reached 502 score points.

11. Resilient students are those who come from a socio-economically disadvantaged background and perform much higher than would be predicted by their background. To identify these students, first, the relationship between performance and socio-economic background across all students participating in the PISA 2009 assessment is established. Then the actual performance of each disadvantaged student is compared with the performance predicted by the average relationship among students from similar socio-economic backgrounds across countries. This difference is defined as the student's residual performance. A disadvantaged student is classified as resilient if his or her residual performance is found to be among the top quarter of students' residual performance from all countries.

12. In the United States, one unit of the *PISA index of student-teacher relationship* is positively associated with 14.9 score points on the PISA reading scale (Table IV.4.1).

13. An average proportion of school principals in the United States report that a number of student-related factors hinder learning "to some extent" or "a lot."

14. Vertical differentiation refers to the ways in which students progress through the education systems as they become older. Even though the student population is differentiated into grade levels in practically all schools in PISA, in some countries, all 15-year-old students attend the same grade level, while in other countries they are dispersed throughout various grade levels as a result of policies governing the age of entrance into the school system and/or grade repetition. Horizontal differentiation refers to differences in instruction within a grade or education level. Horizontal differentiation, which can be applied by the education system or by individual schools, groups students according to their interests and/or performance. At the system level, horizontal differentiation can be applied by schools that select students on the basis of their academic records, by offering specific programmes (vocational or academic, for example), and by setting the age at which students are admitted into these programmes. Individual schools can apply horizontal differentiation by grouping students according to ability or transferring students out of the school because of low performance, behavioural problems or special needs.

15. OECD (2010a), *OECD Factbook 2010*, OECD Paris.

16. OECD (2010a), *OECD Factbook 2010*, OECD Paris. Ratio of population aged less than 15 to the total population (data from 2008).

17. OECD (2010a), *OECD Factbook 2010*, OECD Paris. Ratio of population aged 65 and older to the total population, (data from 2008).

18. OECD (2010a),*OECD Factbook 2010*, OECD Paris. Annual population growth rate (data from 2007).

19. OECD (2010a),*OECD Factbook 2010*, OECD Paris. Annual population growth in percentage, OECD total, (data from 2007).

20. OECD (2010a), *OECD Factbook 2010*, OECD Paris. Foreign-born population as per cent of the total population, (data from 2007).

21. OECD (2010b), *OECD Economic Surveys: United States 2010*, OECD Publishing. Data from 2009.

22. OECD (2010a),*OECD Factbook 2010*, OECD Paris, Current prices and PPPs (data from 2008).

23. OECD (2010b), *OECD Economic Surveys: United States 2010*, OECD Publishing. Origin of national income in 2009 (per cent of national income).

24. OECD (2010a), *OECD Factbook 2010*, OECD Paris. Total unemployment rates as percentage of total labour force (data from 2008).

25. OECD (2010a), *OECD Factbook 2010*, OECD Paris. Total unemployment rates as percentage of total labour force (data from 2008).

26. OECD (2010c), *Employment Outlook*, OECD Publishing. Unemployed as a percentage of the labour force in the age group: youth aged 15-24 (data from 2008).

27. The OECD follows standard international conventions in using the term "tertiary education" to refer to all post-secondary programmes at ISCED levels 5B, 5A and 6, regardless of the institutions in which they are offered. OECD (2008), *Tertiary Education for the Knowledge Society: Volume 1*, OECD Publishing.

28. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Public expenditure presented in this table includes public subsidies to households for living costs (scholarships and grants to students/households and students loans), which are not spent on educational institutions (data from 2006).

29. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Public expenditure presented in this table includes public subsidies to households for living costs (scholarships and grants to students/households and students loans), which are not spent on educational institutions (data from 2006).

30. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Net enrolment rates of ages 4 and under as a percentage of the population aged 3 to 4 (data from 2008).

31. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. OECD average net enrolment rates of ages 4 and under as a percentage of the population aged 3 to 4 (data from 2008).

32. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Net enrolment rates of ages 5 to 14 as a percentage of the population aged 5 to 14 (data from 2008).

33. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. OECD average net enrolment rates of ages 5 to 14 as a percentage of the population aged 5 to 14 (data from 2008).

34. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Net enrolment rates of ages 15 to 19 as a percentage of the population aged 15 to 19 (data from 2008).

35. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. OECD average net enrolment rates of ages 15 to 19 as a percentage of the population aged 15 to 19 (data from 2008).

36. OECD (2010d), Net enrolment rates of ages 20 to 29 as a percentage of the population aged 20 to 29 (data from 2008). This figure includes includes all 20-29 year olds, including those in employment, etc. The Gross Enrolment Ratio (GER), measured by the United Nations as the number of actual students enrolled/number of potential students enrolled, is generally higher. The GER for tertiary education in the US in 2008 is 83% (*www.WorldBank.org*).

37. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. OECD average net enrolment rates of ages 20 to 29 as a percentage of the population aged 20 to 29 (data from 2008).

38. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Data from 2008.

39. Data is not applicable because category does not apply.

40. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Data from 2008.

41. Data is not applicable because category does not apply.

42. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Data from 2008.

43. Data is not applicable because category does not apply.

44. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Data from 2008.

45. Data is not applicable because category does not apply.

46. Data is not applicable because category does not apply.

47. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Starting salary/minimum training in USD adjusted for PPP (data from 2008).

48. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Data from 2008.

49. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Data from 2008.

50. OECD (2010d), *Education at a Glance 2010,* OECD Publishing. Sum of upper secondary graduation rates for a single year of age (year of reference for OECD average: 2008).