



2

Three Perspectives on Educational Equity and Equality

In discussing equity and equality in education, this chapter examines how differences in student performance are distributed across countries and schools, and the extent to which students and schools with different socio-economic backgrounds have access to similar educational resources, both in quantity and quality. It also discusses the impact of students' family background and school location on learning outcomes.

This chapter explores equity and equality in education from three perspectives: first, it examines differences in the distribution of learning outcomes among students and schools; then it studies the extent to which students and schools with different socio-economic backgrounds have access to similar educational resources, both in terms of quantity and quality; and finally, it looks at the impact of students' family background and school location on learning outcomes. This chapter provides a broad perspective of two themes that are further developed in Chapters 3, 4 and 5: Chapter 3 concentrates on how student performance is related to students' socio-economic background; Chapter 4 focuses on the relationship between student performance and immigrant status and the language spoken at home; and Chapter 5 examines how students' performance is related to their schools' socio-economic intake. Chapter 6 discusses the policy implications of this volume's findings.

EQUALITY IN LEARNING OUTCOMES

An analysis of how the learning outcomes are distributed throughout a school system provides valuable policy insights for stakeholders interested in education. Equality in learning outcomes can be understood as the difference between high- and low-performing students. It can also be understood to mean that all students perform at a baseline level of proficiency. In the former approach, the difference between the low- and high-performing students identifies the performance disadvantage of low-performing students relative to their high-performing peers. By contrast, the absolute proportion of students who fall below a baseline level of performance can signal those students who have not acquired the fundamental knowledge or mastered the basic skills that will enable them to progress further in education and beyond. Both these relative and absolute measures of equality in learning outcomes provide insight into the extent to which a school system fails to provide all students with equal and adequate levels of knowledge and skills.

Relative performance gaps within countries

At the top end of the performance distribution, students with more ability, effort and/or opportunities to learn achieve high scores on the PISA assessment of reading, pulling ahead from the middle of the performance distribution. A similar situation occurs at the bottom of the scale: low-performing students, whether due to low levels of ability, effort and/or opportunities to learn fall behind the middle of the distribution. A relatively large gap at the bottom implies that there is a large difference in reading performance between a country's low performers and the middle of the distribution. In countries with large performance gaps at the bottom, the low-performing students are at a double disadvantage: not only do they perform less well than their peers; they are also more likely to lack the most basic reading skills. International comparisons are another useful benchmark as they help policy makers develop a deeper understanding of performance gaps within countries by providing examples of countries where the gaps are narrower (see Chapter 1 and Figure II.1.1).

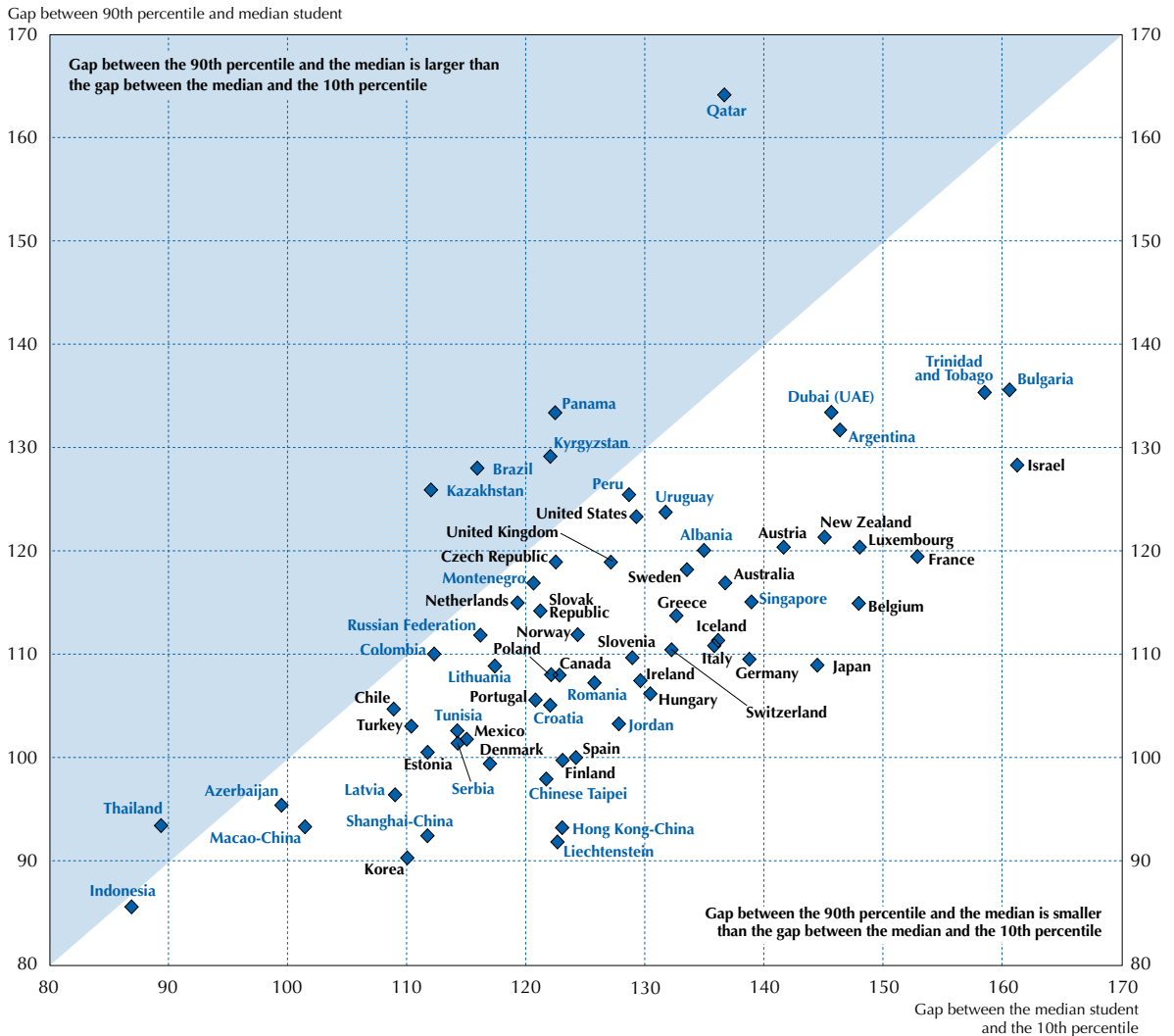
The score point differences across percentiles of the performance distribution are good measures of performance gaps within countries. The 10th percentile is the score reached by 9 out of 10 students, but not reached by the lowest performing 10%. The 50th percentile, also known as the median score, is defined as the score that half of the students in the country do not reach and the other half exceed. Therefore, the median student is the student in the middle of the performance distribution for each system. The difference in score points between the median and the 10th percentile is a measure of the achievement gap at the bottom end of the distribution.¹ Similarly, the gap between the median and the 90th percentile (the score exceeded by only 1 in 10 students) is a measure of the achievement gap at the top.

Figure II.2.1 compares these two measures of performance gaps across the whole distribution of student performance within each country. The figure shows the gap at the top end of the distribution on the vertical axis and the gap at the bottom end in the horizontal axis. The dots represent each education system, and their position indicates how they fare along these two dimensions. A diagonal line divides the figure into two halves. Dots in the top half, above the diagonal, represent systems where the gap at the top end is larger than the gap at the bottom end of the student performance distribution.

Figure II.2.1 shows that the gap at the bottom end of the performance distribution is, in general, wider than the gap at the top end (except in six partner countries). The distinction hints at the source of variation in student performance within each country. The gap at the top end of the scale is also a good within-country benchmark to gauge the size of the gap at the bottom end. In general, school systems with low mean performance have wider performance gaps, particularly at the top of the performance distribution.²



■ Figure II.2.1 ■
Performance differences among the highest- and lowest-achieving students
Gaps at the top and bottom end of the distribution of reading performance



Note: The performance gap between percentiles is displayed in terms of score points.

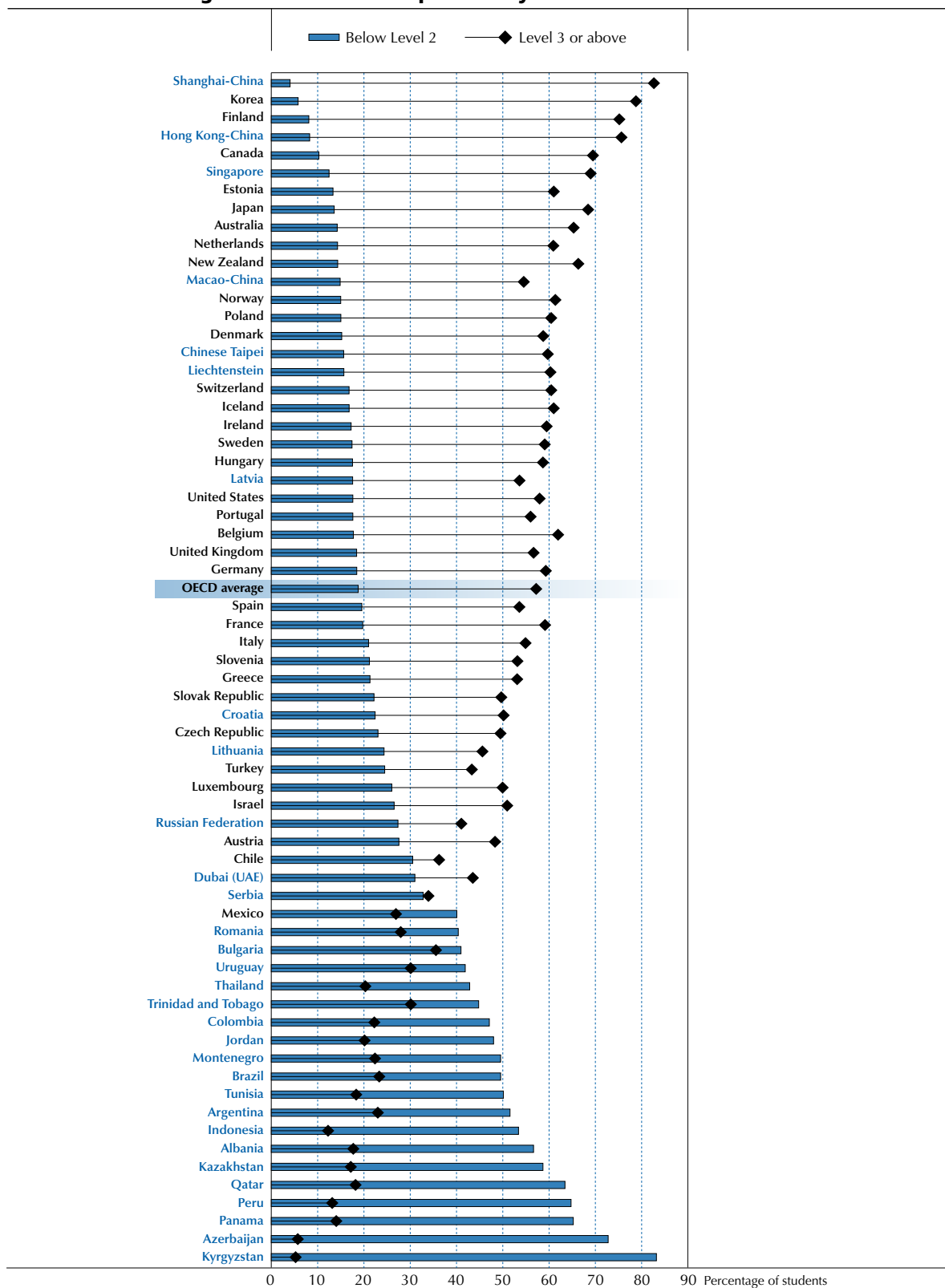
Source: OECD, *PISA 2009 Database*, Table II.1.1.

StatLink <http://dx.doi.org/10.1787/888932343570>

Figure II.2.1 also highlights large differences between the gaps at the top and bottom ends of the distribution for some countries. Among OECD countries, for example, Japan, Germany, Slovenia, Switzerland, Italy, Iceland and Norway all share similar gaps at the top end of the distribution of about 111 score points, the OECD average. However, the gaps at the bottom end of the distribution within this group of countries range from 124 in Norway to 144 score points in Japan (Table II.1.1). Also, Austria, Luxembourg, New Zealand, the United States and Israel show similar gaps at the top of the distribution, all with gaps of 120 score points or more. Yet, in the United States, the gap at the bottom is very similar to the gap at the top at 129 score points, whereas in Israel, the gap at the bottom is 161 score points and at the top is 128 score points; in Austria, Luxembourg and New Zealand, the gap at the bottom is in the range of 142 to 148 score points. The same patterns are evident among the partner countries and economies, where, for example, Argentina, Bulgaria, Dubai (UAE) and Trinidad and Tobago have large gaps at the bottom, both in absolute terms and relative to the gaps at the top end of their performance distributions. A similar picture emerges if other percentiles are used to analyse performance distribution, or if this analysis is carried out with data from previous PISA assessments. These findings mirror the results from other international assessments (Brown and Micklewright, 2004).


■ Figure II.2.2 ■

Percentage of students below proficiency Level 2 and at Level 3 or above



Countries are ranked in ascending order of percentage of students below proficiency Level 2.

Source: OECD, PISA 2009 Database, Table I.2.1.

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Share of the students failing to reach a baseline level of proficiency

As discussed in Volume I, *What Students Know and Can Do*, PISA assesses reading performance along seven levels of proficiency, of which Level 2 is judged the baseline level at which students begin to demonstrate the reading literacy competencies that will enable them to participate effectively and productively in life. Students proficient at Level 2 are capable of tasks such as locating information that meets several criteria, comparing or contrasting against a single feature in the text, 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. Students performing below Level 2 may have learned to read, but they struggle with using reading for learning. From an equity perspective, this is a critical group of students. These students are disadvantaged by their performance, particularly from an international perspective, as they move beyond education and into increasingly globalised labour markets.

Students scoring below reading proficiency Level 2 are a particularly vulnerable group. Their limited abilities put their future educational and work-related careers at risk. Longitudinal studies confirm this. In Canada, for example, of the 9% of students who scored below Level 2 in reading in PISA 2000, two-thirds of them had not progressed to post-secondary education and only 10% of them had reached university. In contrast, the majority of students proficient at Level 2, but no higher, had moved to post-secondary education, and only 7% of those proficient at Level 5 had not pursued any form of post-secondary education (OECD, 2010c). Evidence from Australia, Switzerland and Uruguay shows similar results and emphasises the direct or indirect positive relationship between performance in PISA and acquiring more education, attending and successfully completing more intellectually challenging vocational schools or acquiring tertiary education (Marks, 2007; Bertschy *et al.*, 2009; Boado and Fernández, 2010).

Level 2 on the PISA reading scale is thus a useful benchmark for many countries as it assists them in identifying the population that is at greater risk of leaving school early or not achieving its full potential. Figure II.2.2 shows the percentage of students across countries who do not reach Level 2. In some countries with a high proportion of students proficient at Level 2, a different benchmark might be more meaningful. For example, students who perform at Level 3 or above are those who perform well above the baseline requirements.

Figure II.2.2 shows marked differences across countries in the percentage of students who do not reach proficiency Level 2.³ On average across the OECD, 19% of students are not proficient at Level 2. In Korea, Finland and Canada, among OECD countries, 10% or less of students do not reach this basic level of competency. In contrast, in Austria, Israel and Luxembourg, more than a quarter of students do not reach Level 2, and in Chile and Mexico, 30% and 40% of students, respectively, do not reach this level. In Mexico and Turkey, the proportion of students not enrolled at school by the age of 15 is around 35% while it is below 10% in all other OECD countries (Table A2.1). If these students who are not enrolled in school were assessed by PISA, the proportion of students who do not reach Level 2 in the PISA assessment would most likely be higher. In 19 out of the 31 partner countries and economies, 40% or more of students do not reach Level 2 (Table II.2.1). In 21 out of 31 partner countries and economies, the proportion of 15-year-olds not enrolled at school by the age of 15 is larger than the OECD average, and in 16 countries it is more than double the average, reaching more than 20% in 5 cases.

EQUITY IN THE DISTRIBUTION OF EDUCATIONAL RESOURCES

A 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 benefit from similar resources. Therefore, if there is a positive relationship between the socio-economic background of schools and the quantity or quality of resources, more advantaged schools benefit from 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.

Figure II.2.3 shows the relationship between the socio-economic background of schools – the average *PISA index of economic, social and cultural status* of the students in the school – and a host of school characteristics, such as the student-teacher ratio, the proportion of full-time teachers, the *index of teacher shortage*, and the *index of quality of educational resources*. Relationships in which students that attend disadvantaged schools where the principal reports more quantity and/or better quality resources are coloured light blue; those relationships where students that attend disadvantaged schools have less or lower-quality resources are coloured medium blue. If the relationship in a school system is stronger than the OECD average, it appears in bold. For those systems where there is no apparent association, the cell is coloured in dark blue.

■ Figure II.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
- Within country correlation is not statistically significant
- Advantaged schools are more likely to have more or better resources, in **bold** if relationship is statistically different from the OECD average

		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.

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As Figure II.2.3 shows, in 16 OECD countries, the student-teacher ratio relates positively to the socio-economic background of schools. In these countries, more disadvantaged schools tend to have more teachers in comparison with the number of students, which signals that around half of OECD countries try to allocate more teachers into socio-economically disadvantaged schools, presumably with the objective of moderating that disadvantage. This relationship is particularly pronounced in Belgium, Italy, Ireland, Spain, Estonia, Iceland, Portugal, Japan, the Netherlands and Korea. Among OECD countries, only in Turkey, Slovenia, Israel and the United States are socio-economically disadvantaged schools characterised by higher student-teacher ratios; that is, in these countries disadvantaged schools tend to be worse off in terms of the availability of teachers (Table II.2.2).

Figure II.2.3 also shows the relationship between the average socio-economic background of schools and the proportion of full-time teachers on the school staff, as well as the proportion of full-time teachers with advanced university-level qualifications. In the majority of OECD countries, disadvantaged schools tend to have higher proportions of full-time teachers. However, when taking into account the proportion of those full-time teachers who have an advanced university degree, it is the students attending more advantaged schools who tend to enjoy a higher proportion of high-quality, full-time teachers. These results suggest that students attending socio-economically disadvantaged schools are not at an educational disadvantage in terms of the number of teachers available. They are, however, at a disadvantage in terms of the quality of teachers available to instruct them.

Together, the preceding findings suggest that ensuring an equitable distribution of resources is still a major challenge for many countries, if not in terms of the quantity of resources, then in terms of their quality. Volume IV, *What Makes a School Successful?*, takes this analysis further by examining the interrelationship between socio-economic background and resources, policies and practices in greater detail.

EQUITY IN LEARNING REGARDLESS OF STUDENT BACKGROUND

In a system characterised by an equitable distribution of educational opportunities, students' performance is independent of their background. This includes several dimensions, such as the socio-economic status of the students' family, their family structure and the geographic location of the school. In this system, the relationship between academic achievement and student background is weak as all students enjoy the same opportunities to achieve their potential and their outcomes represent their efforts, abilities and ambitions fairly. In contrast, in a system characterised by a strong relationship between background and performance, some students, characterised by their socio-economic disadvantage, their family structure or the school location, are less likely to fulfil their academic potential because they do not enjoy the same opportunities.

This section introduces elements of family and community background that have been measured by PISA and studies their interrelationship. It also reviews how student performance relates to these variables and discusses the extent to which that relationship varies among countries. Weaker relationships between background characteristics and reading performance in some countries compared to others signal that inequalities in educational opportunity are not inevitable.

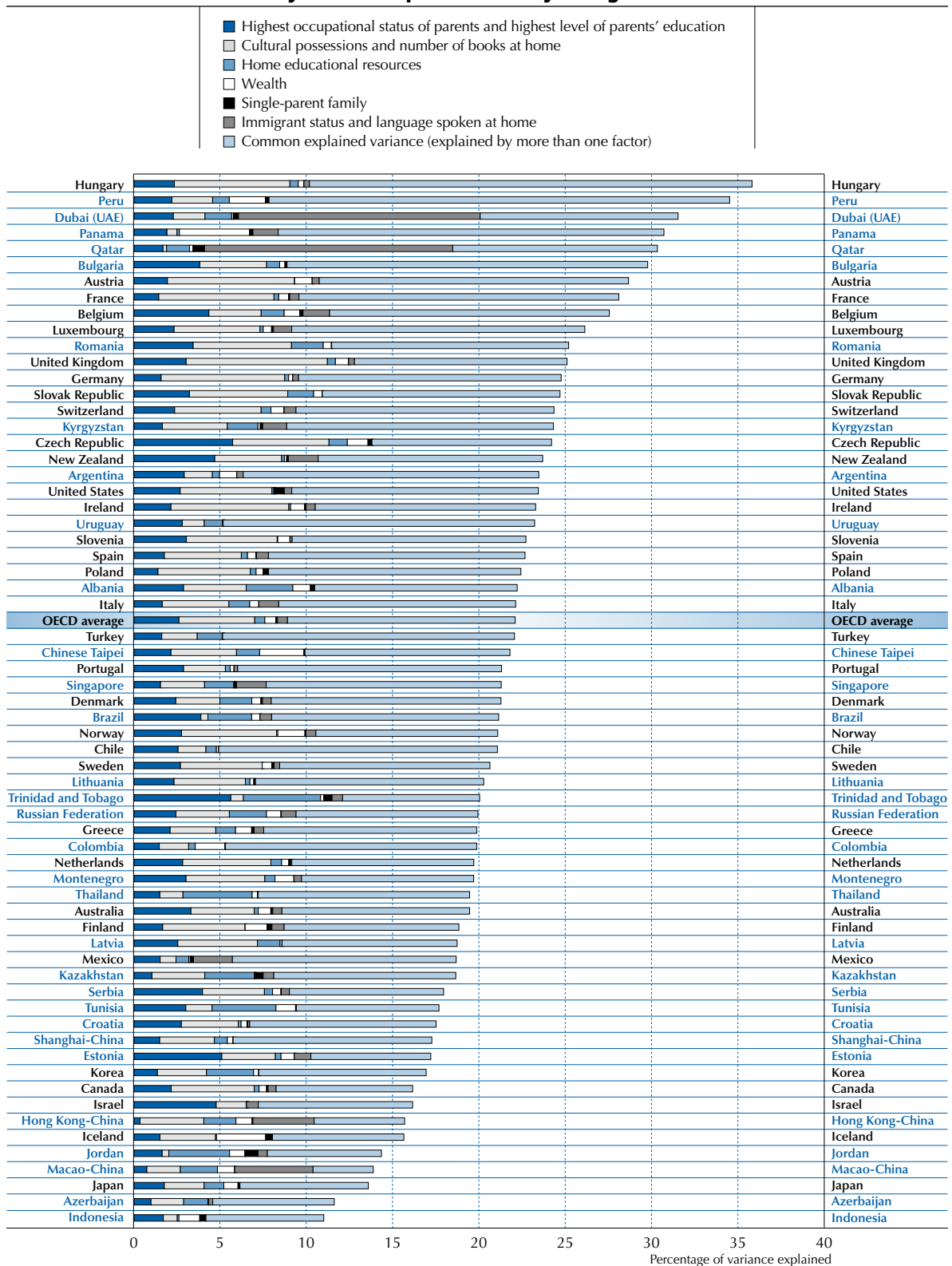
Family and socio-economic background

Data gathered through PISA allow researchers to examine the extent to which socio-economic background relates to successful student and school performance, and thus to assess how equitably educational opportunities are distributed. Where students and schools consistently perform well, regardless of their socio-economic status, educational opportunities can be considered to be distributed more equitably; where student and school performance strongly depends on socio-economic status, large inequalities in the distribution of educational opportunities persist and the potential of students remains unfulfilled.

To assess the impact of socio-economic background on student performance, PISA collected detailed information from students on various aspects relating to the economic, social and cultural status of their families. More specifically, PISA includes information on the education level and occupational status of students' fathers and mothers and their access to cultural and educational resources at home. Box II.1.2 and Annex A1 give details on the construction of these indices. The relationship between socio-economic background and performance does not necessarily reflect inequalities that occur within the boundaries of the school; inequities also hinge on societal arrangements for family healthcare, income maintenance, housing and childcare, to name just a few factors. Indeed, some of these factors, or their interaction with socio-economic background, may have as much or a greater impact on performance than schools. While PISA did not collect information about these factors, it is worth keeping them in mind when interpreting the results reported here.

■ Figure II.2.4 ■

Percentage of variance in reading performance explained by various aspects of family background



Countries are ranked in descending order of the sum of common explained variance and variance explained by each component.

Source: OECD, PISA 2009 Database, Table II.2.4.

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Previous PISA assessments showed that in many countries, poor performance in school did not automatically follow from a disadvantaged home background. This finding has important implications for policy makers. Skills in reading are the basis for lifelong learning and enhance future opportunities for employment and earnings. As a consequence, countries in which the relationship between socio-economic background and reading performance is strong do not fully capitalise on the potential of students from disadvantaged backgrounds. Human capital may thus be wasted and intergenerational mobility from a lower to a higher socio-economic status may be limited. Poorer performing students will almost certainly be those least likely to obtain employment that offers the promise of economic and social mobility. This is a loss not just for individuals, but also for societies that are increasingly dependent on the contributions of all of their members for economic growth (OECD, 2010a).

Figure II.2.4 summarises, for each country, the degree to which various components of home and family background are associated with reading performance. The figure provides a first broad view of this issue, which is further developed in subsequent chapters of this volume. The components analysed here are: parents' occupational status; parents' level of education converted into years of schooling; cultural possessions; family structure; students' immigrant status; and the language spoken at home. Since these components tend to be associated with each other – for example, a student whose parents are better educated is also likely to have parents in higher-status occupations – the graph displays the influence of these features together and shows the variance in student performance explained by each feature once the influence of the others has been accounted for. The final segment in Figure II.2.4 shows the variance explained jointly by all factors (Table II.2.4).

Home and family background exerts a powerful influence on student performance across countries. For example, across OECD countries, differences in students' family background characteristics explain up to 22% of differences in student performance. Figure II.2.4 shows that, in general, these background characteristics explain reading performance jointly; that is, the different background characteristics are related to each other, such that the variance in reading performance explained by more than one factor jointly is 13% across the OECD countries. However, countries differ widely in the proportion of the variation in student performance explained by these factors. The percentage of explained variance ranges from 14% in Japan to 36% in Hungary, it is less than 18% in Iceland, Israel, Canada, Korea and Estonia, and more than 26% in Austria, France, Belgium and Luxembourg. The same is true among the partner countries and economies, with comparative little variance explained in Azerbaijan, Indonesia, Macao-China, Jordan, Hong Kong-China, Croatia, Shanghai-China and Serbia and a large portion of variance explained in Peru, Bulgaria, Dubai (UAE), Panama, Qatar and Romania (Table II.2.4). In some countries, many 15-year-olds have already left school and are thus not assessed by PISA (Table A2.1). Because these students are likely to be disadvantaged and to perform poorly, the variation in the performance of 15-year-olds in these countries may be grossly underestimated by the variation in the performance of enrolled students.

Since various aspects of socio-economic background tend to be closely interrelated, most of the remainder of the report summarises them in a single index, the *PISA index of the economic, social and cultural status* of students. The index was constructed such that roughly two-thirds of the OECD student population are between the values of -1 and 1, with an average score of 0 (*i.e.* the mean for the combined student population from the participating OECD countries is set to 0 and the standard deviation is set to 1).

Socio-economic background is only one aspect of a student's background. Other factors include family structure, school location (related to home background in terms of community context), immigrant status and home language (relative to the language of assessment in PISA). The rest of this chapter discusses the relationship between student performance and family structure and school location. Chapters 3 and 5 take a deeper and more thorough look at the relationship between socio-economic background and student performance at both the student- and school-level. Chapter 4 focuses specifically on immigration and the language spoken at home with regard to reading performance.

Family structure

The family is usually the first place where students can be encouraged to learn and family differences may influence learning beyond what occurs in the classroom. For example, parents may read to their young children, assist them with homework and, in some countries, actively participate and help out in schools. For older students, a supportive family can provide encouragement and meet with teachers or school administrators to keep track of their children's progress in school. Students with less supportive family backgrounds may therefore benefit from targeted support within the school system.⁴

Across countries, a large number of students live in families with one parent. Among OECD countries, 17% of the 15-year-old population covered by the PISA 2009 assessments were students from single-parent families. This proportion was 15% in PISA 2000. Many of these students share a socio-economically disadvantaged background. On average across the OECD, the average socio-economic background of students from single-parent families is -0.2, significantly below the average socio-economic background of 0.1 that corresponds to students living in other types of families (Table II.2.5).

Figure II.2.5 shows the average performance of students living in a single-parent household compared to other students (mixed and two-parent family structures), before and after accounting for socio-economic background. Across the OECD area, the performance gap between students from single-parent families and students from other types of families is 18 score points, before taking into account socio-economic background, which is roughly equivalent to half a year of schooling. In general, accounting for socio-economic background reduces, and in some cases eliminates, the gap. The reduction shows that family structure is related to socio-economic background and the separate impact of each of these variables on student performance cannot be disentangled easily using PISA. The fact that, in many countries and even after accounting for students' socio-economic status, differences in reading performance by family structure remain signals that there is an independent relationship between family structure and educational opportunities.

On average, after accounting for background, students from single-parent families score five points lower than students from other types of families. As Figure II.2.5 shows, across OECD countries, the gap is particularly large in the United States, where, after accounting for socio-economic background the difference stands at 23 score points. In Mexico, Ireland and Poland, it is 13 score points, and in Japan, Luxembourg and Belgium it is 10 score points, double the average size of the gap in OECD countries (Table II.2.5). In contrast, 25% of students in Chile come from single-parent families and they perform on a par with their peers from other family structures. In the United Kingdom, which has a similar proportion of single-parent family students as Chile, the same is true only after accounting for socio-economic background. In Austria, Slovenia, Portugal and Switzerland, about 15% of students live in single-parent households and there is no marked difference in performance between them and students from other family structures. In Estonia, students from single-parent families actually perform better after accounting for socio-economic background. Among the partner countries and economies, 28% of students in Trinidad and Tobago come from single-parent families, and they score 28 points lower than their peers from other types of families, after accounting for socio-economic background. The performance gap is 61 score points in Qatar and affects 12% of students. In Jordan, the proportion of students from single-parent families is similar to that of Qatar and the gap is 38 score points, while in Tunisia and Dubai (UAE) the gap is 25 points.

Evidence that students in single-parent families perform poorly might seem to be discouraging. The variation in the differences across countries, however, suggests that the disadvantage associated with single-parent families is not inevitable. Public policy in general, and educational policies in particular, can narrow the gaps by making it easier for single parents to support and foster their children's education (Pong, Dronkers and Hampden-Thompson, 2004). School systems and individual schools can consider, for example, how and what kinds of parental engagement are to be encouraged among single parents who have limited time to devote to school activities. Obviously, education policies need to be examined in conjunction with other policies, such as those relating to welfare and childcare.

School location and variation in performance across geographical areas

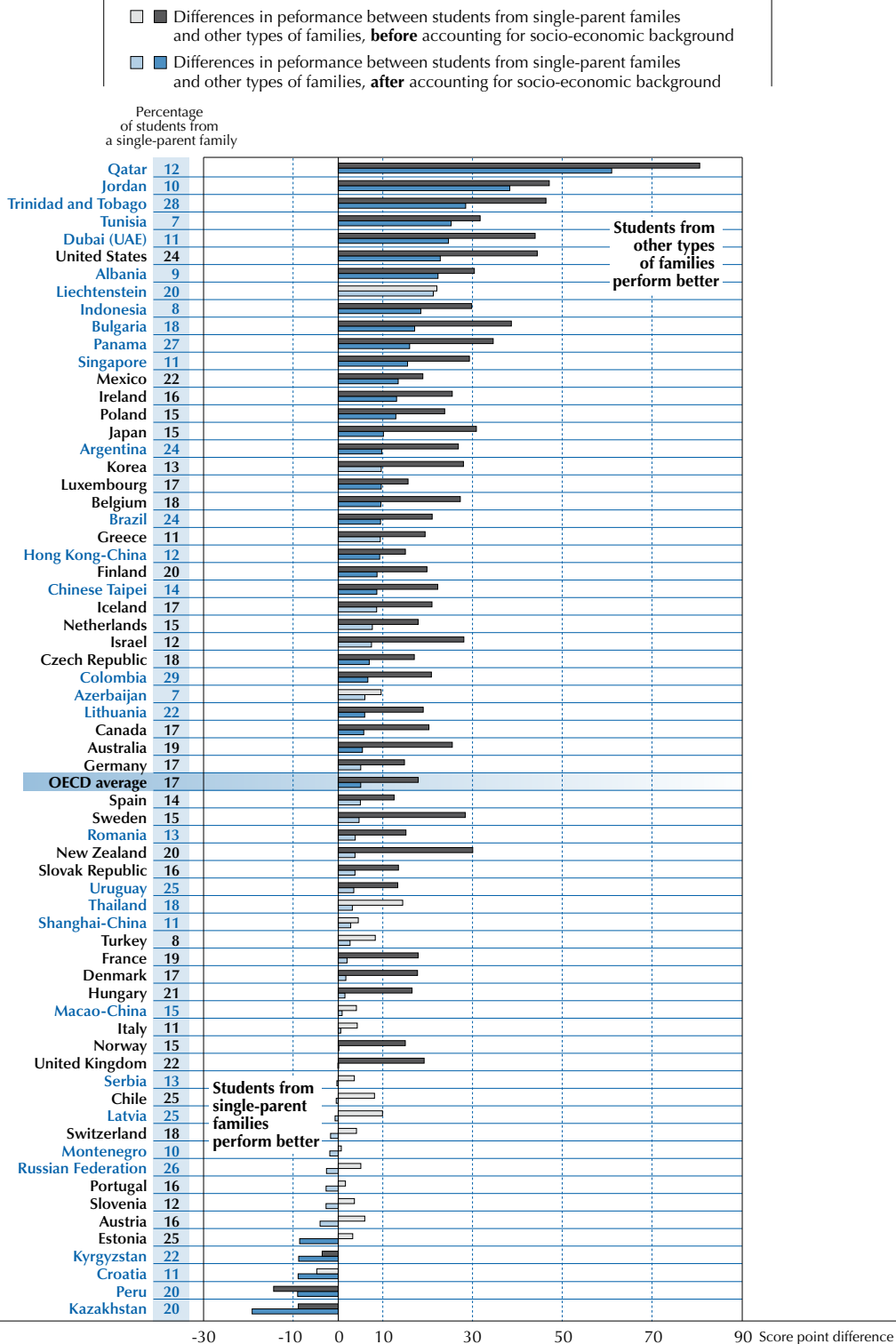
In some countries, student performance and the socio-economic or organisational profile of school systems also vary considerably according to where schools are located. To capture variation among school systems and regions within countries, some countries have undertaken the PISA surveys at regional levels (e.g. Belgium, Finland, Italy, Spain and the United Kingdom). Results at the regional levels for these countries are presented in Annex B2 of this volume.

An analysis of regional differences adds a useful perspective. Compared with an international perspective, regions within a country are likely to share many cultural, social and economic characteristics. A regional analysis thus yields insights for policy makers that are less influenced by cross-country differences. PISA countries that gather data at the regional level have the unique opportunity to foster greater co-operation and collaboration across educational authorities and some do so actively (Bussière *et al.*, 2007).



■ Figure II.2.5 ■
**Reading performance difference between students from single-parent families
 and those from other types of families**

Differences in performance before and after accounting for socio-economic background



Note: Score point differences that are statistically significant are marked in a darker tone.

Countries are ranked in descending order of the score point differences between students from single-parent families and other types of families after accounting for socio-economic background.

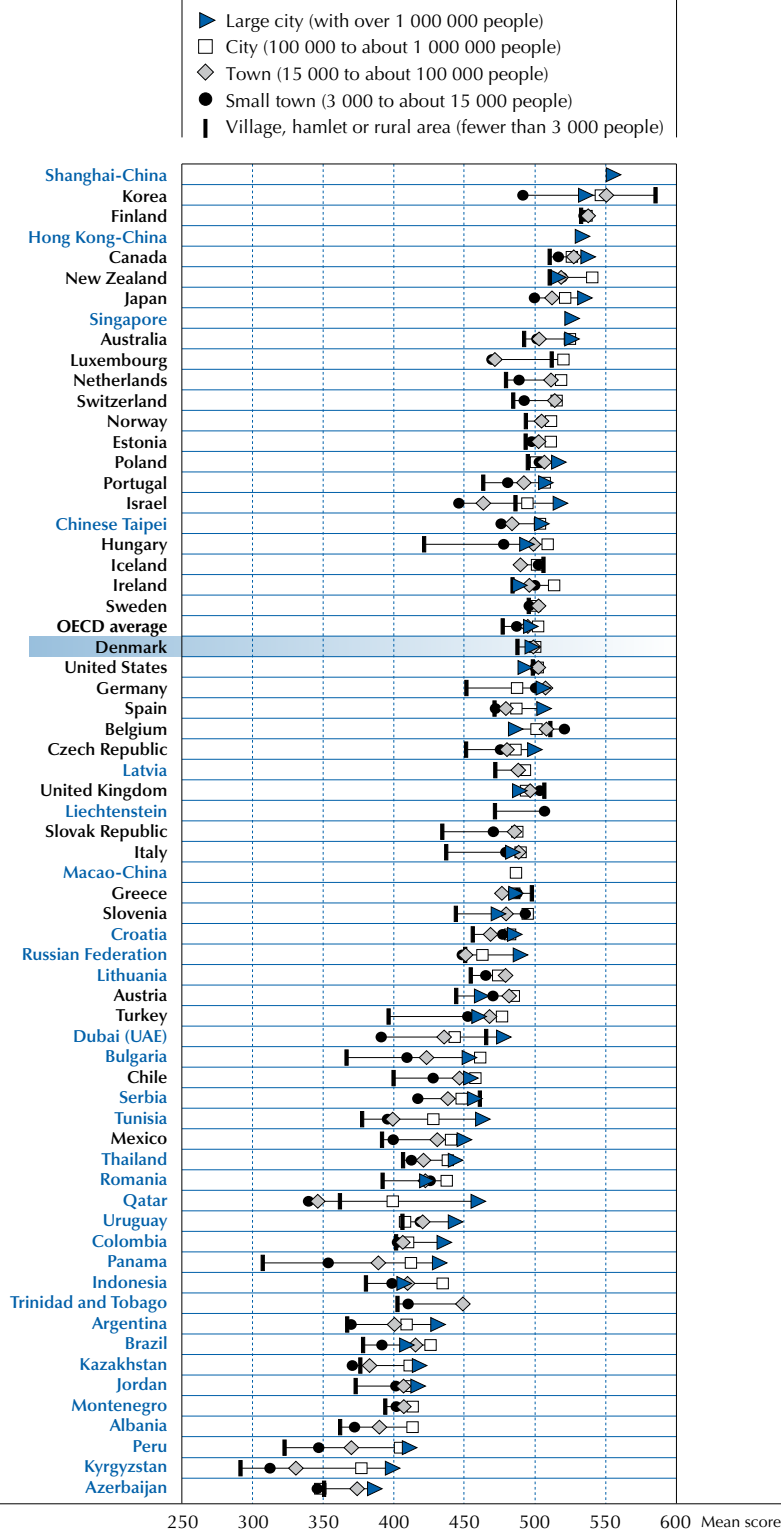
Source: OECD, PISA 2009 Database, Table II.2.5.

StatLink <http://dx.doi.org/10.1787/888932343570>

■ Figure II.2.6 ■

Reading performance, by school location

Mean scores after accounting for socio-economic background



Countries are ranked in descending order of the average performance of students in cities (cities and large cities). For Liechtenstein and Trinidad and Tobago where this is not possible, the average of remaining categories was used.

Source: OECD, PISA 2009 Database, Table II.2.6.

StatLink <http://dx.doi.org/10.1787/888932343570>



Another way to analyse geographical performance variation is by school location. Schools are located in communities of different sizes. A large community or a densely populated area can make more educational resources available for students. Isolated communities might need targeted support or specific educational policies to ensure that students attending these schools reach their full potential. Sometimes the differences in performance by school location are the result of the different socio-economic context of these locations. Countries vary widely in the densities, characteristics and distributions of populations across different types of communities (Table II.2.6) and these differences need to be borne in mind when interpreting a cross-country analysis of how students in these different communities perform.

On average across the OECD, students in city schools perform better than students in other schools, even after accounting for differences in socio-economic background. As Figure II.2.6 shows, in the OECD area, students in city schools outperform students in rural schools by 40 score points, or the equivalent of one year of education. This general pattern is not observed, however, after accounting for socio-economic background, in Korea, Belgium, the United Kingdom, Greece, Iceland, the United States, Finland, Sweden, Poland, Israel, Ireland, the Netherlands and Germany. Where the pattern is evident, the size of the gaps differs across countries, which probably reflects differences in the resources and learning opportunities available in rural, urban and suburban areas, as well as differences in population density, distribution of labour markets, and the extent to which urban and suburban areas are sought and populated by different individuals that may indirectly impact learning outcomes. For example, in Turkey, the Slovak Republic, Chile, Mexico and Italy as well as the partner countries Peru, Tunisia, Albania, Argentina and Romania, the performance gap between students in city schools and those in rural schools is more than 45 score points, after accounting for students' socio-economic background. This gap is 80 score points or more – or the equivalent of two years of schooling – in Hungary and in the partner countries Bulgaria, Kyrgyzstan and Panama (Table II.2.6).

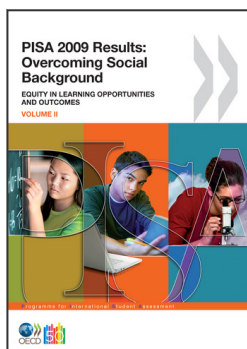
Figure II.2.6 can also be used to compare the performance of large cities across countries. In the OECD countries Canada, Japan, Korea, Poland and Australia, large cities - those with more than one million inhabitants - perform best, above 530 score points on average, before accounting for socio-economic background. The performance of students attending large-city schools, after accounting for their socio-economic background, is close to 536 score points in Korea, Japan and Canada, whereas in Australia it is 526 score points and in Poland 517 score points. In Luxembourg and Finland, the average performance of schools in their largest communities, cities with 100 000 to 1 000 000 inhabitants, is also high at 564 and 543 score points, respectively, while, after accounting for socio-economic background, it is 520 score points in Luxembourg and 537 score points in Finland. Among the partner countries and economies, students in cities with more than 1 000 000 people in Hong Kong-China and Shanghai-China perform at 534 and 556 score points, respectively, before and after accounting for students' socio-economic background.

Comparing performance before and after accounting for socio-economic background shows the extent to which differences in student performance by school location are related to differences in socio-economic background between school locations within countries. A large difference in adjusted and unadjusted performance, as is the case with Poland, is evidence of the large gap in socio-economic background between urban and rural areas. In the case of Poland, this difference in the average socio-economic background of urban and rural students is close to one standard deviation, so differences in performance reflect, in part, differences in the social background of students living in urban and rural areas. They may also reflect differences in the distribution of other educational factors that may be associated with socio-economic disparities that have an impact on student performance (Table II.2.6).

Many of the analyses presented in this chapter highlight the existence of inequities and inequality in educational outcomes, in the distribution of educational resources, and in learning outcomes inasmuch as they are associated with students' background characteristics. This chapter also highlights the fact that inequities and inequality vary substantially across countries, signalling that they are by no means inevitable, although some countries succeed better than others in reducing educational inequities.

Notes

1. Although PISA describes a wide range of student performance, the variance in student performance in countries with very low average performance may be underestimated because it is more difficult to distinguish between very low and extremely low levels of performance.
2. The Pearson correlation between the gap at the top and bottom ends of the distribution is 0.64 and statistically significant across all countries and economies that participated in the PISA 2009 assessment. The same correlation is stronger and statistically significant if the group is restricted to OECD countries (0.71) or partner countries and economies (0.69). Spearman correlations are very similar (0.65, 0.69 and 0.68, respectively). The correlation between the gap at the top end of the distribution and the mean performance is negative and statistically significant, but smaller at 0.40. The same is true if the median is used instead of the mean performance. However, the Spearman correlation is smaller, 0.31, and not statistically significant. This suggests that the relationship might be driven by a particular country. Comparing only OECD countries, the correlation between the gap at the top and the mean performance, whether Pearson or Spearman, is negative, weak (-0.10) and not statistically significant, while among partner countries and economies it is negative, strong (-0.51) and statistically significant. There is no statistically significant correlation between the gap at the bottom end of the distribution and mean or median performance, however it is measured, across systems. Across all countries or just for OECD countries, the correlations are small and positive (around 0.10), while across the partner countries and economies the correlations are very small and negative (around -0.01).
3. The percentage of students below Level 2 are calculated on the basis of students with valid information on the *PISA index of economic, social and cultural status*. As a result, estimates differ slightly from those presented in Volume I, *What Students Know and Can Do*.
4. The literature on the relationship between family structure and performance is vast, and parental engagement is only one of the aspects analysed in this literature. The literature has focused on the economic situation and, particularly, the stress levels of the family stemming from the transition from one type of family to another and from precarious economic situations. See, for example, Buchmann and Hannum (2001) for a cross-national look at this relationship; McLanahan and Sandefur (1994) for the consequences for students; Raley, Frisco and Wildsmith (2005) for a study of status and stress by comparing single-parent households to cohabitation; and Jeynes (2005) for a discussion about parental involvement in single-parent households. For classic studies on the differences in the use of language by social class, including parent-child interactions and language quality and richness, see Brice (1983). Also, see Volume IV, *What Makes a School Successful?*, for differences in the types and level of parental involvement in school across selected PISA countries.



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