PISA 2009 at a Glance

OECD

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Foreword

PISA 2009 at a Glance *offers a reader-friendly introduction to five of the six volumes of* PISA 2009 Results.

PISA, the OECD's Programme for International Student Assessment, evaluates the quality, equity and efficiency of school systems in some 70 countries that, together, make up nine-tenths of the world economy. PISA represents a commitment by governments to regularly monitor the outcomes of education systems within an internationally agreed framework. It also provides a basis for international collaboration in defining and implementing educational goals in innovative ways that reflect judgements about the skills that are relevant to adult life.

Around 470 000 students participated in PISA 2009, representing about 26 million 15-year-olds in the schools of the 65 participating countries and economies. Some 50 000 students took part in a second round of this assessment, representing about 2 million 15-year-olds from 10 additional partner countries and economies.

The main focus of PISA 2009 was reading. The survey also updated performance assessments in mathematics and science. PISA considers students' knowledge in these areas not in isolation, but in relation to their ability to reflect on their knowledge and experience and apply them to real-world issues. The emphasis is on mastering processes, understanding concepts and functioning in various contexts within each assessment area.

For the first time, the PISA 2009 survey also assessed 15-year-old students' ability to read, understand and apply digital texts.

The structure of PISA at a Glance 2009 mirrors that of the PISA 2009 Results *volumes. The first section, "What Students Know and Can Do", presents an overview of 15-year-olds' performance in reading, mathematics and science in the 2009 assessment. The second part, "Overcoming Social Background", discusses how socio-economic background is related to learning opportunities and outcomes. "Learning to Learn", the third part of* PISA at a Glance, *surveys students' attitudes towards, and their levels of engagement in, reading and learning. The last section, "What Makes a School Successful?", examines how education policies and allocation of resources are associated with student reading performance. Findings from the fifth volume of* PISA 2009 Results, Learning Trends, *are incorporated throughout.*

Figures and charts are all accompanied by a dynamic hyperlink, or StatLink, that directs readers to an Internet site where the corresponding data are available in Excel™ format. Reference is often made to charts and tables that appear in PISA 2009 Results *volumes. This material can generally be accessed via the StatLinks accompanying the charts or at www.pisa.oecd.org, where readers can find out more about PISA.*

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This book has...

StatLinks

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If you're reading the PDF e-book edition, and your PC is connected to the Internet, simply click on the link. You'll find *StatLinks* appearing in more OECD books.

PISA countries and economies

OECD countries	Partners countries and economies in PISA 2009	Partners countries in previous PISA surveys
Australia	Albania	Macedonia
Austria	Argentina	
Belgium	Azerbaijan	
Canada	Brazil	
Chile	Bulgaria	
Czech Republic	Colombia	
Denmark	Costa Rica*	
Estonia	Croatia	
Finland	Georgia*	
France	Himachal Pradesh-India*	
Germany	Hong Kong, China	
Greece	Indonesia	
Hungary	Jordan	
Iceland	Kazakhstan	
Ireland	Kyrgyzstan	
Israel	Latvia	
Italy	Liechtenstein	
Japan	Lithuania	
Korea	Macao, China	
Luxembourg	Malaysia*	
Mexico	Malta*	
Netherlands	Mauritius*	
New Zealand	Miranda-Venezuela*	
Norway	Moldova	
Poland	Montenegro	
Portugal	Netherlands-Antilles*	
Slovak Republic	Panama	
Slovenia	Peru	
Spain	Qatar	
Sweden	Romania	
Switzerland	Russian Federation	
Turkey	Serbia	
United Kingdom	Shanghai, China	
United States	Singapore	
	Tamil Nadu-India*	
	Chinese Taipei	
	Thailand	
	Trinidad and Tobago	
	Tunisia	
	Uruguay	
	United Arab Emirates*	
	Vietnam*	

* These partner countries and economies carried out the assessment in 2010 instead of 2009.

Reader's Guide

Data underlying the figures

The tables of data on which the figures in this publication are based can be found in the individual volumes of *PISA 2009 Results* as indicated and, in greater detail, on the PISA website (*www.pisa.oecd.org*).

Five symbols are used to denote missing data:

a The category does not apply in the country concerned. Data are therefore missing.

c There are too few observations or no observation to provide reliable estimates (*i.e.* there are fewer than 30 students or less than 5 schools with valid data).

m Data are not available. These data were collected but subsequently removed from the publication for technical reasons.

w Data have been withdrawn or have not been collected at the request of the country concerned.

x Data are included in another category or column of the table.

Country coverage

This publication features data on 65 countries and economies, including all 34 OECD countries and 31 partner countries and economies (see Figure I.1.1 in *PISA 2009 Results* Volume I, *What Students Know and Can Do*). The data from another nine partner countries were collected a year later and will be published in 2011.

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

Reporting student data

The report uses "15-year-olds" as shorthand for the PISA target population. PISA covers students who are aged between 15 years 3 months and 16 years 2 months at the time of assessment and who have completed at least 6 years of formal schooling, regardless of the type of institution in which they are enrolled and of whether they are in full-time or part-time education, whether they attend academic or vocational programmes, and whether they attend public or private schools or foreign schools within the country.

Reporting school data

The principals of the schools in which students were assessed provided information on their schools' characteristics by completing a school questionnaire. Where responses from school principals are presented in this publication, they are weighted so that they are proportionate to the number of 15-year-olds enrolled in the school.

Focusing on statistically significant differences

This publication discusses only differences or changes that are statistically significant.

Categorising student performance

This report uses shorthand to describe students' levels of proficiency in the subjects assessed by PISA:

Top performers are those students proficient at Level 5 or 6 of the assessment

Strong performers are those students proficient at Level 4 of the assessment

Moderate performers are those students proficient at Level 2 or 3 of the assessment

Lowest performers are those students proficient at Level 1 or below of the assessment

Short descriptions of the seven levels of reading proficiency applied in PISA 2009 are presented below. A difference of about 73 score points represents one proficiency level on the PISA reading scale; and one school year corresponds to an average of 39 score points on the PISA reading scale.

Level	Lower score limit	Percentage of students able to perform tasks at this level or above	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.
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.
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. 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. Often the required information is not prominent or there is much competing information, or there are other text obstacles, such as ideas that are contrary to expectation or negatively worded. 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.
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.
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.

Calculating international averages

An OECD average was calculated for most indicators presented in this report. In the case of some indicators, a total representing the OECD area as a whole was also calculated:

- The OECD average corresponds to the arithmetic mean of the respective country estimates.
- The OECD total takes the OECD countries as a single entity, to which each country contributes in proportion to the number of 15-year-olds enrolled in its schools (see Annex B for data). It illustrates how a country compares with the OECD area as a whole.

In this publication, the OECD total is generally used when references are made to the overall situation in the OECD area. Where the focus is on comparing performance across education systems, the OECD average is used. In the case of some countries, data may not be available for specific indicators, or specific categories may not apply. Readers should, therefore, keep in mind that the terms "OECD average" and "OECD total" refer to the OECD countries included in the respective comparisons.

Rounding figures

Because of rounding, some figures in tables may not exactly add up to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

If a country is described as falling within a range of percentages, that means that the country's raw percentage (the amount *before* rounding) falls within the range.

All standard errors in this publication have been rounded to two decimal places. Where the value 0.00 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.005.

Abbreviations used in this publication

ESCS – PISA index of economic, social and cultural status

GDP – Gross Domestic Product

Further documentation

For further information on the PISA assessment instruments and the methods used in PISA, see the *PISA 2009 Technical Report* (OECD, forthcoming) and the PISA website (*www.pisa.oecd.org*).

PISA at a Glance uses the OECD's StatLinks service. Below each table and chart is a URL leading to a corresponding Excel™ workbook containing the underlying data. These URLs are stable and will remain unchanged over time. In addition, readers of this e-book will be able to click directly on these links and the workbook will open in a separate window, if their internet browser is open and running.

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1. WHAT STUDENTS KNOW AND CAN DO

What can students do in reading?

How do countries/economies perform in reading overall?

How do girls compare to boys in reading skills?

What can students do in mathematics?

How do countries/economies perform in mathematics overall?

How do girls compare to boys in mathematics skills?

What can students do in science?

How do countries/economies perform in science overall?

How do girls compare to boys in science?

How many students are top performers?

Trends

Performance in reading since 2000

Changes in reading scores since 2000

Reading scores among low-performing students

Reading scores among high-performing students

Girls' and boys' reading performance since 2000

Performance in mathematics since 2003

Performance in science since 2006

What can students do in reading?

- *On average across OECD countries, 19% of 15-year-olds do not attain reading proficiency Level 2, and 8% attain proficiency Level 5 or above.*
- *Only 1% of students, on average across OECD countries, and nowhere more than 3%, can perform the most complex reading tasks at proficiency Level 6.*
- *In 10 partner countries, only a minority of students reaches Level 2. However, the great majority of 15-year-olds in these countries shows at least some reading proficiency.*

What it means

Students who do not attain the PISA baseline proficiency Level 2 in reading lack the essential skills needed to participate effectively and productively in society. A key priority for all countries is to ensure that as many students as possible attain at least Level 2. At the other end of the performance range, countries can gain competitive advantage in the knowledge economy by educating their students to handle complex reading tasks at Levels 5 and 6.

Findings

On average in OECD countries, just over four in five students (81%) are proficient in reading to at least Level 2. In the OECD countries Finland and Korea, and the partner economies Hong Kong, China and Shanghai, China, over 90% of students reach Level 2 or above, but in 10 partner countries only a minority of students does so. Students who fail to reach Level 2 struggle to perform many everyday reading tasks, and evidence from earlier PISA surveys shows that these students are unlikely to become lifelong learners or do well in the labour market.

However, even most students who do not attain Level 2 can read at some level. In PISA 2009, the measurement of proficiency was extended to incorporate some very straightforward reading tasks, categorised as Level 1b. On average in OECD countries, 99% of students are proficient at Level 1b or above, as are at least 90% of students in all 65 countries and economies that participated in PISA 2009, except Albania, Argentina, Kyrgyzstan, Panama, Peru and Qatar.

At the other end of the performance scale, an average of 8% of students in OECD countries can complete complex reading tasks at Level 5 or 6. These top performers form a pool of talent that will help countries to compete in the global knowledge economy. In New Zealand, the partner economy Shanghai, China and the partner country Singapore, 16% to 19% of students are top performers, at least twice the OECD average. But for some countries, developing even a small corps of high-performing students remains an aspiration: in 16 countries, less than 1% of students reach Level 5.

Among top performing students, only a few can complete the most difficult tasks and attain Level 6, the new top proficiency level introduced in PISA 2009. On average, 1% of students in OECD countries reach this level; while in Australia; New Zealand; Shanghai, China and Singapore, 2% to 3% of students do. However, in 3 OECD countries and 18 partner countries and economies, less than one-tenth of one per cent of students reach Level 6.

Definitions

In the PISA survey, reading tasks are ranked by difficulty and are associated with each of the seven proficiency levels from 1b (easiest) to 6 (hardest). A student reaches a given proficiency level if the test results show that he or she has at least a 50% chance of performing a task at that level. Students are classified at the highest level at which they are proficient.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*

Going further

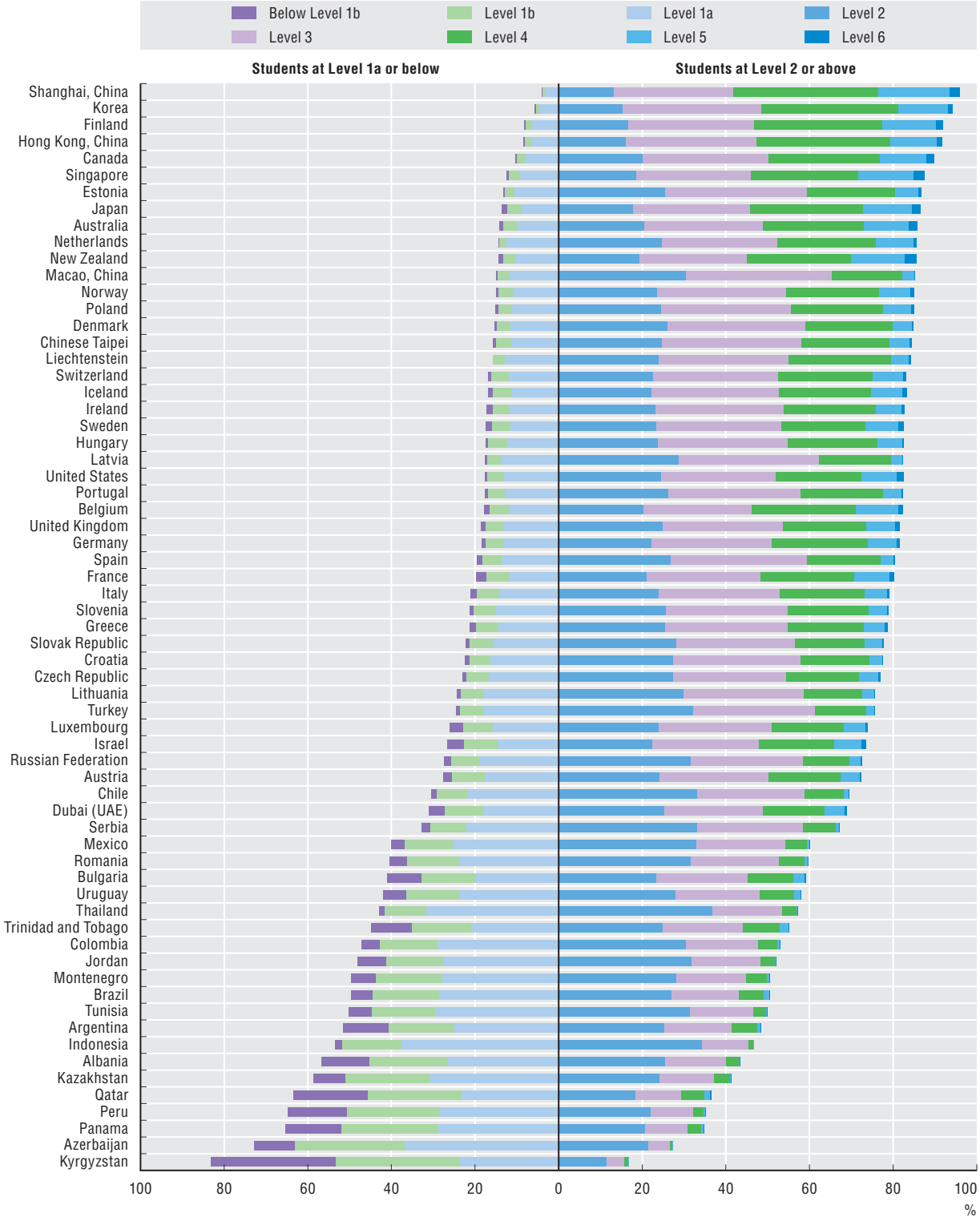
Descriptions of what students can do at each proficiency level, and examples of tasks, are presented in Chapter 2 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Table I.2.1 at the back of that volume.

Further reading from the OECD

PISA 2009 Assessment Framework (2009).

Figure 1.1. **How proficient are students in reading?**

Percentage of students at the different levels of reading proficiency



1. Countries are ranked in descending order of the percentage of students at Levels 2, 3, 4, 5 and 6.

Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.2.14, available at *http://dx.doi.org/10.1787/888932343133*.

How do countries/economies perform in reading overall?

- *The partner economy Shanghai, China shows the highest average reading performance in PISA 2009, followed by the OECD countries Korea and Finland, the partner economy Hong Kong, China and the partner country Singapore.*
- *In most OECD countries, average reading performance is at proficiency Level 3. In the partner countries and economies, the average ranges widely, from Level 1a to Level 4.*

What it means

The mean PISA reading score for each country/economy summarises the performance of students overall. These scores show that reading standards vary greatly among countries and economies in ways that cannot simply be attributed to the countries' different stages of economic development. A nation's wealth influences educational success; but GDP per capita now explains only 6% of the differences between countries' average student performance. The other 94% of diffe-rences reflect the fact that two countries of similar prosperity can produce very different educational results.

Findings

The OECD countries Finland and Korea and the partner economies Hong Kong, China and Shanghai, China show mean reading scores well above any other participants in PISA 2009. Of these, Shanghai, China's score is much higher than that of the other three, whose mean reading scores are not significantly different from each other.

Australia, Canada, Japan, New Zealand and the partner country Singapore also score well above the OECD average, by at least 22 score points, or nearly one-third of a proficiency level.

Another seven OECD countries – Belgium, Estonia, Iceland, the Netherlands, Norway, Poland and Switzerland – and the partner country Liechtenstein also perform significantly above the OECD average.

Overall, the range in country scores is wide, representing large differences in how well students in different countries can read. On average, students in Shanghai, China are proficient to near the bottom of Level 4. At this level, students can identify, interpret and reflect on information in relatively complex written material. In the lowest-performing OECD country, Mexico, students are, on average, proficient to the bottom of Level 2, and in 11 partner countries, average proficiency is at Level 1a or 1b. At these lowest levels, students are only capable of locating and interpreting explicit information in simple written texts.

Definitions

In the original PISA survey in 2000, the mean reading score was set at 500 points for participating OECD countries. In 2009, with a slightly wider range of OECD countries, the average score was 493 points. The original PISA scale was set such that approximately two-thirds of students across OECD countries score between 400 and 600 points. A gap of 72 points in reading scores is equivalent to one proficiency level in reading.

The country averages shown here are estimates based on the PISA sample. In many cases, differences between countries/economies are too close to be statistically significant. In such cases, it cannot be said which of a pair of countries/economies has students with higher average performance.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*

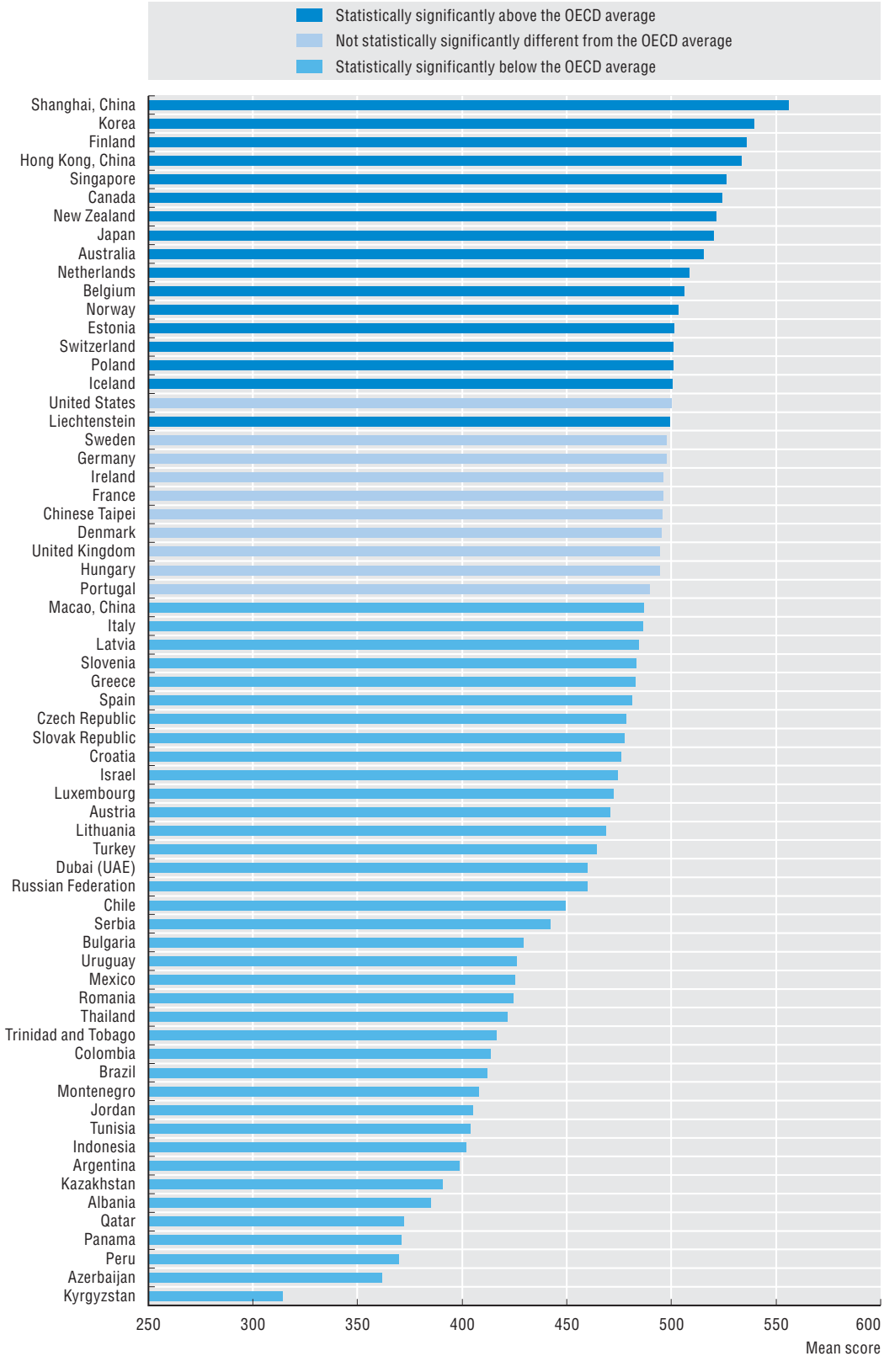
Going further

A full set of comparisons across countries and economies, showing in which cases differences between mean performances are statistically significant, are presented in Chapter 2 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*.

Further reading from the OECD

PISA 2009 Assessment Framework (2009).

Figure 1.2. **Comparing performance in reading**



Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.2.15, available at *http://dx.doi.org/10.1787/888932343133*.

How do girls compare to boys in reading skills?

- *In every one of the 65 countries and economies that participated in PISA 2009, girls have significantly higher average reading scores than boys.*
- *The gender gap in reading varies from more than 50 score points in 14 countries and economies to less than 25 points in 7 countries.*
- *In some high-performing countries, the gender gap is large; but in some East Asian countries and economies, boys score well above the OECD average.*

What it means

Lower reading proficiency among boys has become a major concern in many education systems. Closing the gender gap will help to improve reading performance overall.

Findings

Girls outperform boys in reading in every PISA country. In OECD countries, the average gender gap is 39 score points, or over half a proficiency level.

The widest gender gaps, seen in Albania, Bulgaria and Lithuania, are well over twice the size of the smallest gaps, seen in the OECD country Chile and the partner countries Colombia and Peru.

Wide gender gaps are seen in Nordic countries, including the highest-scoring OECD country, Finland, and in some other high-performing countries, such as New Zealand. In Finland, boys score one-fifth of a proficiency level above the OECD average whereas girls score close to one proficiency level higher. In Korea and the partner economies Hong Kong, China and Shanghai, China, all high-scoring countries with gender gaps close to the average, boys perform better than they do in other countries, scoring well above the OECD average for both genders by 24 to 43 points.

Gender differences are most stark when comparing the proportion of boys and girls who perform at the lowest reading proficiency levels. In 18 countries that score below the OECD average, boys perform below the baseline Level 2, on average, while girls perform below that level, on average, in only 5 countries.

But the extent of underperformance among boys is a crucial issue nearly everywhere. On average in OECD countries, only one in eight girls, but one in four boys, fails to reach Level 2. In some countries, the great majority of underperformers are boys. In Finland, only 3% of girls but 13% of boys do not attain Level 2, while in the partner country Latvia, 9% of girls and 27% of boys do not attain that level.

Definitions

The gender gap measures the difference between the mean performance of boys and girls in reading. On the PISA reading scale, the mean score for OECD countries was originally set at 500 points, and around two-thirds of students in OECD countries score between 400 and 600 points. One proficiency level is equivalent to 72 score points.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*

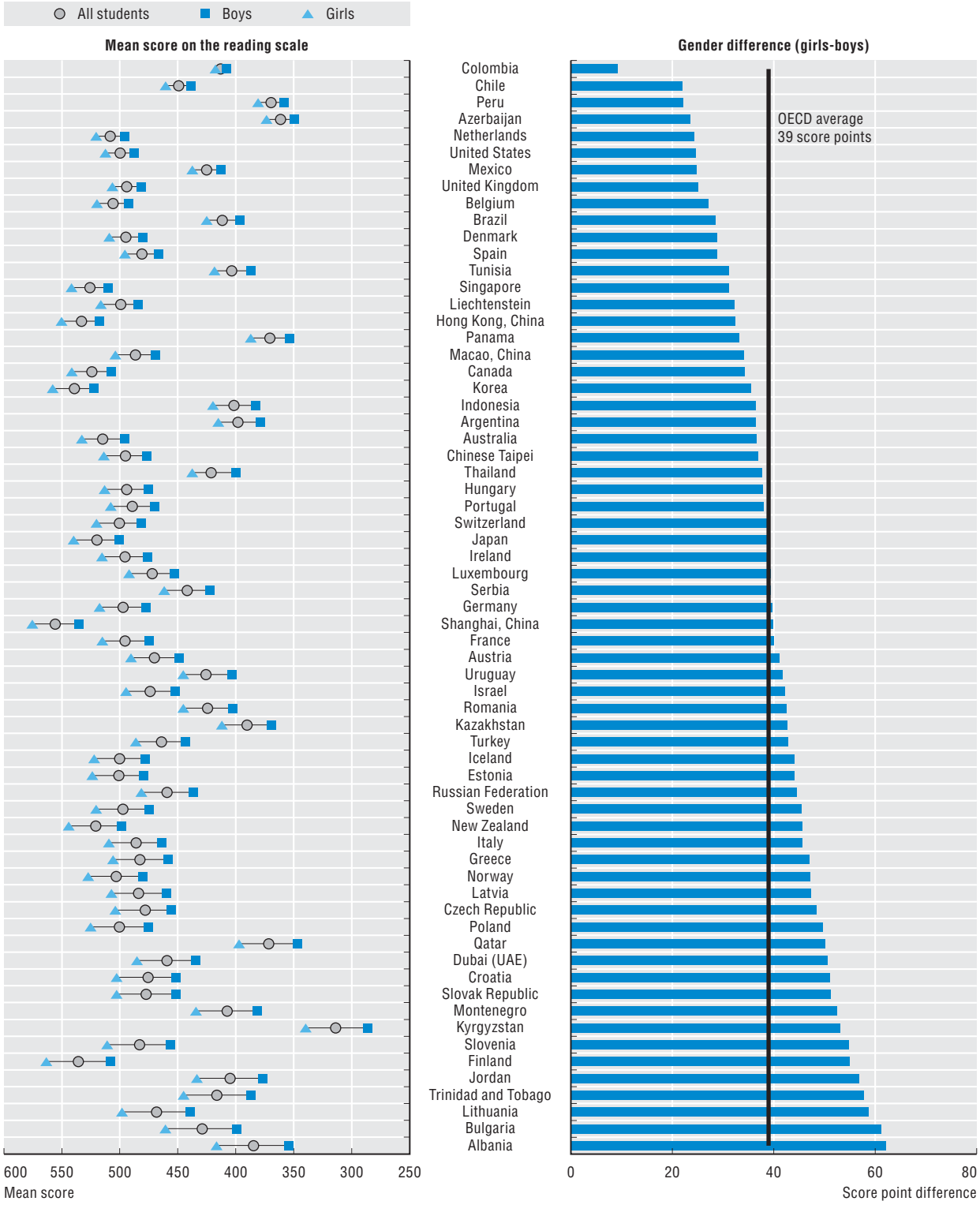
Going further

A full set of comparisons across countries, showing details of gender differences in reading skills, is presented in Chapter 2 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Tables I.2.3 (mean scores) and I.2.2 (proficiency levels) at the back of that volume.

Further reading from the OECD

Equally Prepared for Life? How 15-year-old Boys and Girls Perform in School (2009).

Figure 1.3. **Gender differences in reading performance**



Note: All gender differences are significant (see Annex AX). Countries are ranked in ascending order of the gender score point difference (girls-boys).

Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.2.17, available at *http://dx.doi.org/10.1787/888932343133*.

What can students do in mathematics?

- *On average across OECD countries, 22% of 15-year-olds perform below the baseline proficiency Level 2 in mathematics while 13% are top performers in mathematics, attaining Level 5 or 6.*
- *In six countries and economies, more than 90% of students reach at least Level 2, but in 17 countries only a minority do so.*
- *In Korea and the partner countries and economies Chinese Taipei; Hong Kong, China; Shanghai, China and Singapore, between 25% and 51% of students are top performers in mathematics, attaining Level 5 or 6.*

What it means

Students whose proficiency in mathematics is limited to Level 1a or below can, at best, perform simple mathematical tasks in very familiar contexts. They will find it difficult to think mathematically, limiting their ability to make sense of a complex world. A priority for all countries is to ensure that as many students as possible attain at least the baseline proficiency Level 2. At the other end of the performance range, having a corps of students capable of the complex mathematical thinking required at Levels 5 and 6 will help countries to establish a competitive advantage in the global marketplace.

Findings

On average across OECD countries, nearly four in five students (78%) are proficient in mathematics to at least the baseline Level 2. At that level, students can use basic mathematical algorithms, formulae, procedures, or conventions, and can reason mathematically. In the OECD countries Finland and Korea, and in the partner countries and economies Hong Kong, China; Liechtenstein; Shanghai, China and Singapore, over 90% of students reach Level 2 or above. But only a minority of students reaches Level 2 in Chile, Mexico and 15 partner countries.

At the other end of the scale, one in eight students (13%), on average in OECD countries, is proficient at Level 5 or6. These top performers are capable of complex mathematical tasks requiring broad, well-developed thinking and reasoning skills. In Korea, the highest-performing OECD country in mathematics, one in four students (26%) reaches this level. More students do so in the partner country and economies, Chinese Taipei (29%), Hong Kong, China (31%) and Singapore (36%), and as many as half of the students in Shanghai, China are top performers in mathematics. But in 12 countries, less than 1% of students reach Level 5 or 6.

Among these high performers, fewer than a quarter, on average (3% in OECD countries), attain Level 6, the highest proficiency level. However, in Shanghai, China, more than one-quarter of students (27%) do so and in the partner country Singapore, one student in six (16%) does. The OECD countries with the largest percentage of students attaining Level 6 are Korea and Switzerland, where 8% of students in these countries reach this level.

Definitions

In the PISA survey, mathematics tasks are ranked by difficulty and are associated with each of the six proficiency levels from 1 (easiest) to 6 (hardest). A student reaches a given proficiency level if the test results show that he or she has at least a 50% chance of performing a task at that level. Students are classified at the highest level at which they are proficient.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*

Going further

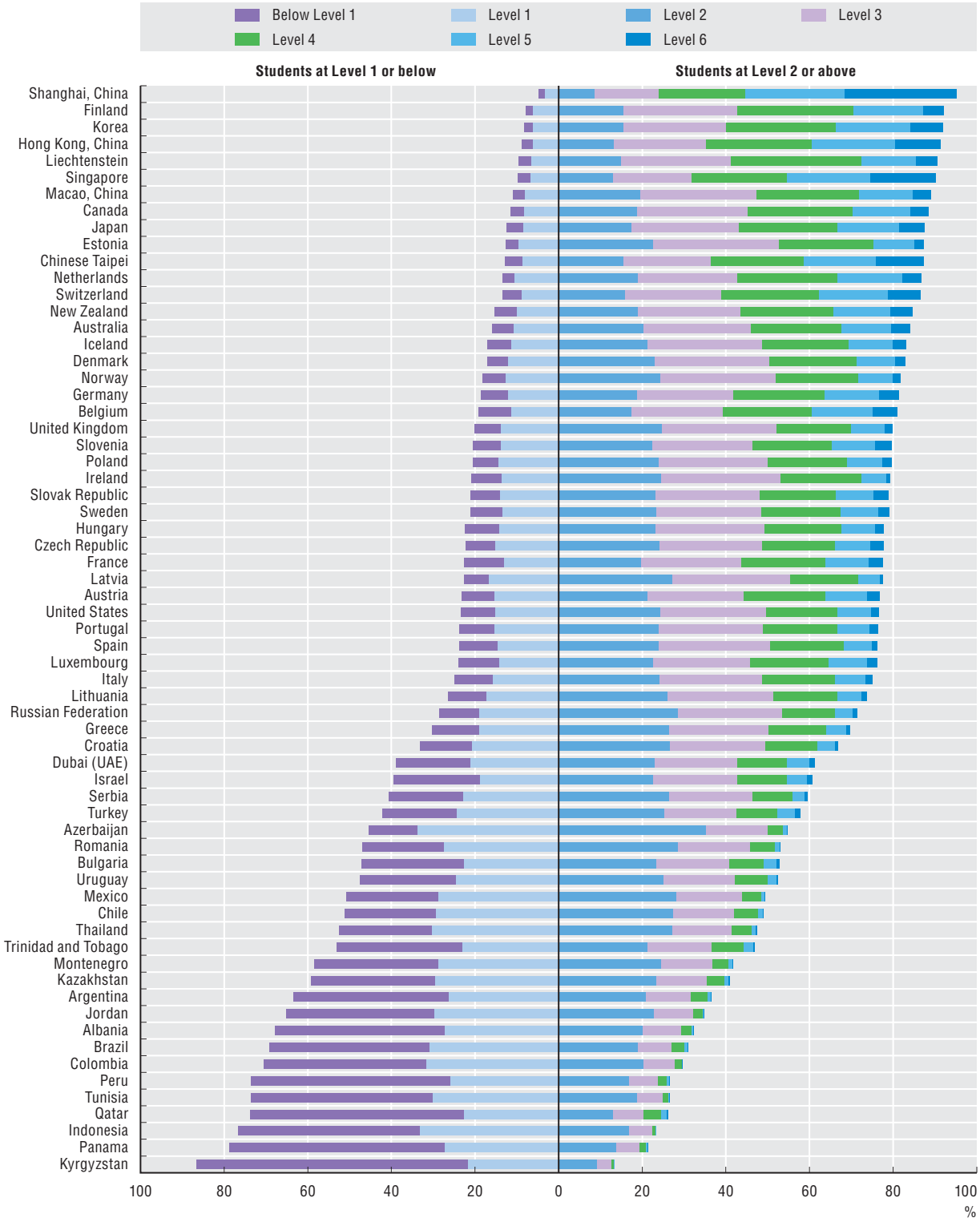
Descriptions of what students can do at each proficiency level and examples of tasks are presented in Chapter 3 of *PISA 2009 Results Volum I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Table I.3.1 at the back of that volume.

Further reading from the OECD

Mathematics performance was assessed in depth in 2003, and will be again in 2012. See: The PISA 2003 Assessment Framework (2003) and Learning for Tomorrow's World, First Results From PISA 2003 (2004).

Figure 1.4. **How proficient are students in mathematics?**

Percentage of students at the different levels of mathematics proficiency



Note: Countries are ranked in descending order of the percentage of students at Levels 2, 3, 4, 5 and 6.

Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3.9, available at *http://dx.doi.org/10.1787/888932343152*.

How do countries/economies perform in mathematics overall?

- *The partner economy Shanghai, China shows the highest average mathematics score among countries participating in PISA 2009, followed by the partner country Singapore, the partner economy Hong Kong, China, the OECD country Korea and, in fifth place, the partner economy Chinese Taipei.*
- *Students in Shanghai, China performed nearly one proficiency level above those in the OECD country Finland, the best-performing country outside East Asia.*
- *In most OECD countries, average mathematics performance is at Level 3, but in partner countries and economies, the average varies widely, from below Level 1 to nearly Level 5.*

What it means

The mean PISA mathematics score for each country/economy summarises the performance of students overall. The results show a much wider range of scores in mathematics than in reading among countries and economies. Of the three subjects assessed by PISA, reading, mathematics and science, mathematics is the one where high-performing East Asian countries and economies show the largest advantage over all other countries that participated in PISA 2009.

Findings

The partner economy Shanghai, China and the partner country Singapore show mean mathematics scores that are much higher than those of any other country or economy that participated in PISA 2009. Shanghai, China is furthest ahead, with students there more than half a proficiency level, on average, above those in any other country or economy.

Canada, Finland, Japan, Korea, the Netherlands, Switzerland and the partner countries and economies Chinese Taipei; Hong Kong, China; Liechtenstein and Macao, China all perform at between one half and an entire proficiency level above the OECD average in mathematics.

The abovementioned countries, together with Australia, Belgium, Denmark, Estonia, Germany, Iceland, New Zealand and Slovenia, all score significantly above the OECD average in mathematics.

Overall, the range in country performance is wide, representing large differences in how well students in different countries can think mathematically. Students in Shanghai-China are, on average, proficient at using their well-developed mathematical skills and representing complex situations mathematically, tasks that are defined as near the top of Level 4. In comparison, the OECD average rests near the bottom of Level 3. In the lowest-performing OECD country, Mexico, students are, on average, more than one proficiency level below the OECD average; some 14 partner countries also show an average at Level 1 and, in the case of Kyrgyzstan, below Level 1. Students at this level are only able to use mathematics in the most familiar and explicit contexts.

Definitions

In the 2003 PISA survey, the first where mathematics was assessed in detail, the mean mathematics score was set at 500 points for participating OECD countries. In 2009, with a slightly wider range of OECD countries, the average score was 496 points. The original PISA scale was set such that approximately two-thirds of students across OECD countries score between 400 and 600 points. A gap of 62 points in mathematics scores is equivalent to one proficiency level in mathematics.

The country averages shown here are estimates based on the PISA sample. In many cases, differences between countries/economies are too close to be statistically significant. In such cases, it cannot be said which of a pair of countries/economies has students with higher average performance.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

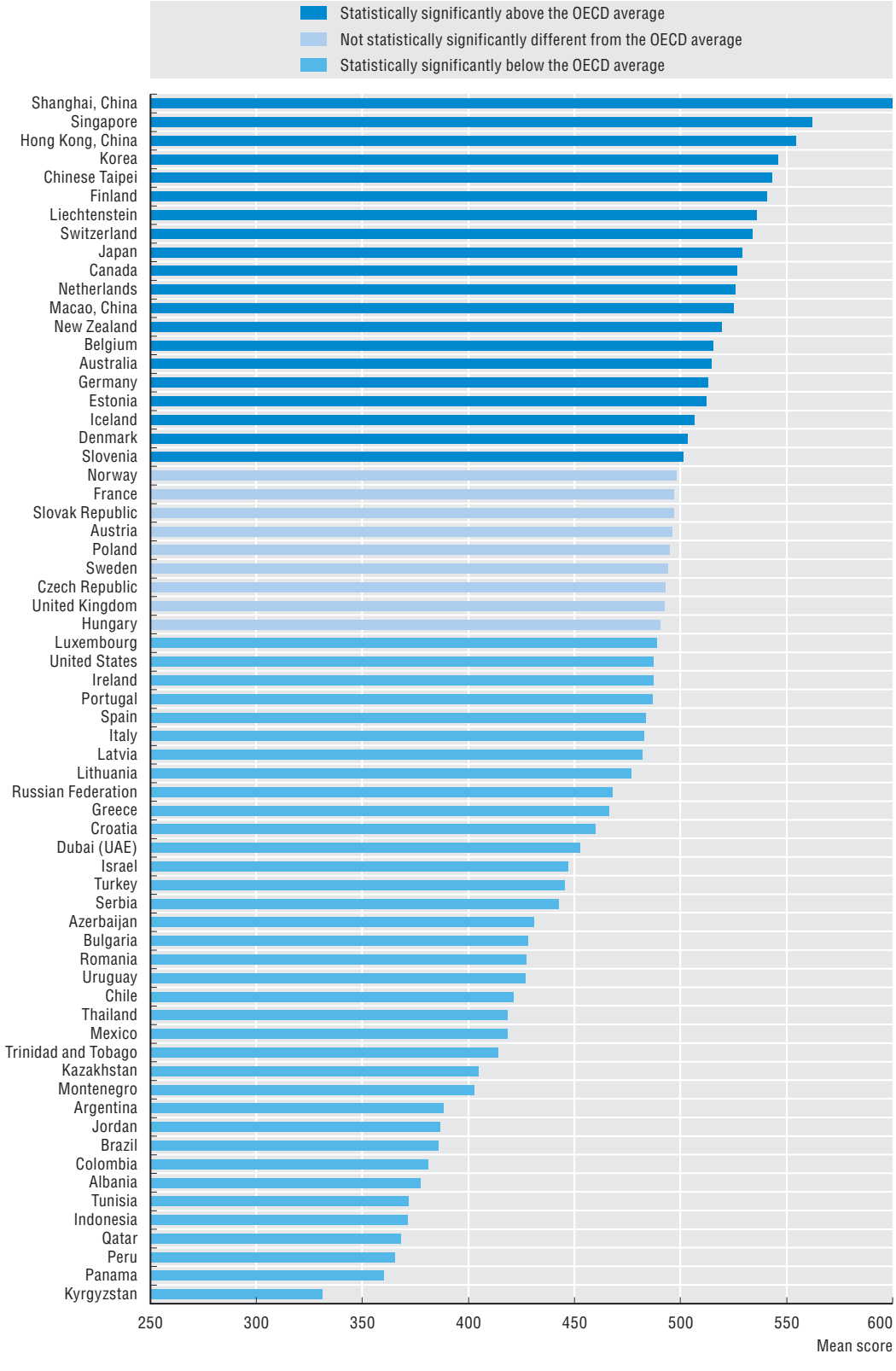
Going further

A full set of comparisons across countries, showing in which cases differences between mean country performance are statistically significant, can be found in Chapter 3 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*.

Further reading from the OECD

Mathematics performance was assessed in depth in 2003, and will be again in 2012. See: *The PISA 2003 Assessment Framework* (2003) and *Learning for Tomorrow's World, First Results From PISA 2003* (2004).

Figure 1.5. **Comparing performance in mathematics**



Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3.10, available at *http://dx.doi.org/10.1787/888932343152*.

How do girls compare to boys in mathematics skills?

- *Boys outperform girls in mathematics in 35 of the 65 countries and economies that participated in PISA 2009. In five countries, girls outperform boys, and in 25 countries there is no significant difference between the genders.*
- *On average in OECD countries, boys outperform girls in mathematics by 12 score points – a gender gap that is only one-third as large as that for reading, in which girls outperform boys.*
- *In Belgium, Chile, Switzerland, the United Kingdom, the United States, and the partner countries Colombia and Liechtenstein, boys outperform girls by more than 20 score points, close to one-third of a proficiency level.*

What it means

Mathematics is an important life skill, and the stereotyped notion that girls are "not good at numbers" has often limited girls' opportunities. But PISA results show that, in some countries, girls perform as well as boys in mathematics. That can be a signal to policy makers that skills in mathematics are not related to gender and that more can be done to raise girls' level of performance in mathematics.

Findings

Boys outperform girls in mathematics by an average of 12 points across OECD countries. This is a small gap compared to the 39 points, on average, in favour of girls in reading performance.

In 35 out of the 65 countries and economies that participated in PISA 2009, boys score significantly higher in mathematics than girls. However, in 25 countries, there is no statistically significant difference, and in 5 countries, girls have slightly higher scores.

In Belgium, Chile, Switzerland, the United Kingdom, the United States and the partner countries Colombia and Liechtenstein, boys have a substantial score advantage, of between 20 and 33 points, in mathematics performance. However, even among these countries, only in Colombia is the male advantage in mathematics greater than the female advantage in reading.

In four out of the six best-performing countries and economies overall, there is little or no gender difference in mathematics performance. Among these, in the partner country and economies Chinese Taipei; Shanghai, China and Singapore, at least 10% of girls attain proficiency Level 6 in mathematics; in no OECD country, except Switzerland, do even 10% of boys reach this level. While this shows girls' potential to perform at the very highest levels in mathematics, in OECD countries, on average, 4% of boys, but only 2% of girls, reach Level 6.

At the other end of the performance spectrum, in OECD countries, an average of 21% of boys and 23% of girls do not reach the baseline proficiency Level 2 in mathematics.

Definitions

The gender gap measures the difference between the mean performance of boys and girls in mathematics. On the PISA mathematics scale, the mean score for OECD countries was originally set at 500 points, and around two-thirds of students in OECD countries score between 400 and 600 points. One proficiency level is equivalent to 62 score points.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

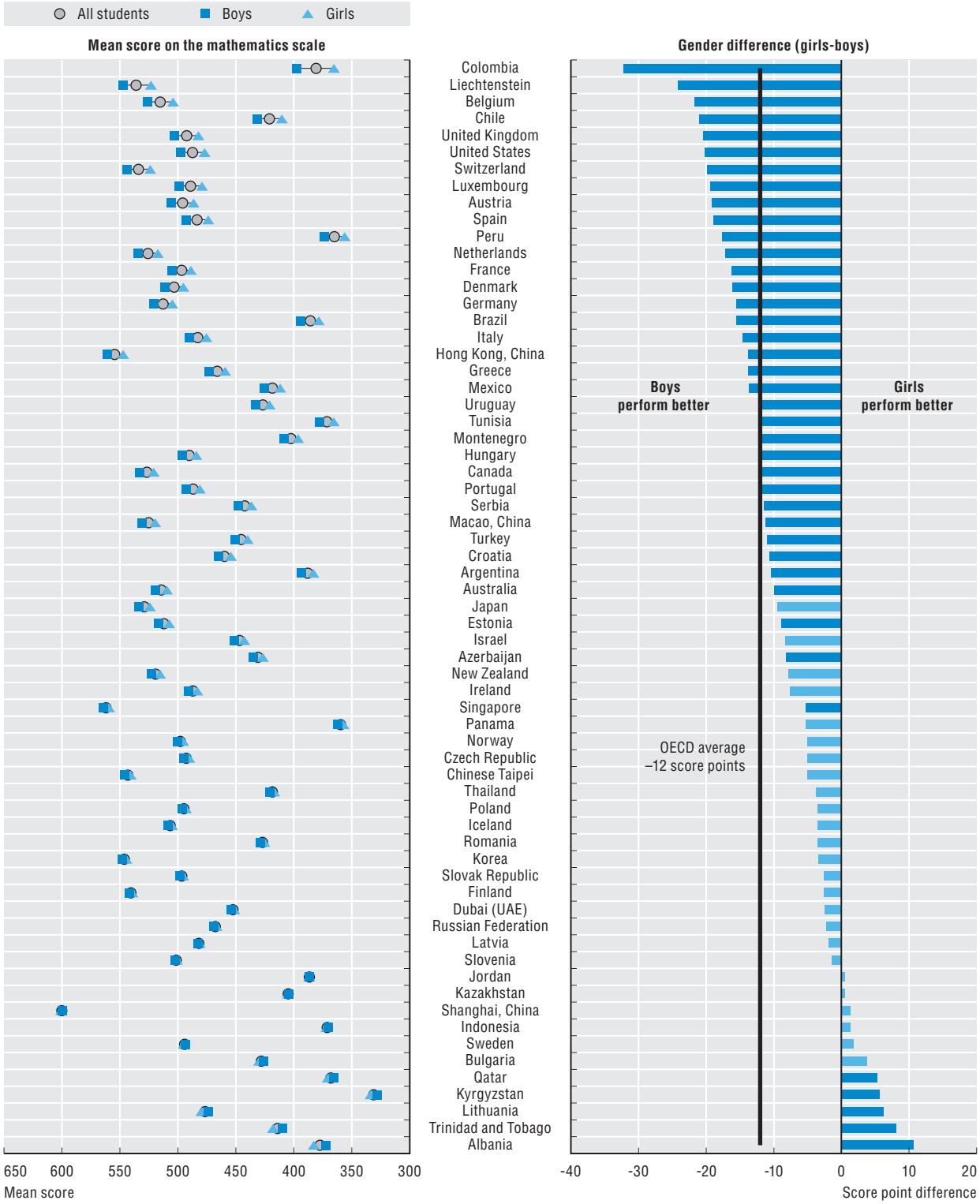
Going further

A full set of comparisons across countries, showing details of gender differences in mathematics performance, is presented in *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Tables I.3.3 (mean scores) and I.3.2 (proficiency levels) at the back of that volume.

Further reading from the OECD

Mathematics performance, including gender differences in various mathematical skills, was assessed in depth in 2003, and will be again in 2012. See: *The PISA 2003 Assessment Framework* (2003) and *Learning for Tomorrow's World, First Results from PISA 2003* (2004).

Figure 1.6. **Gender differences in mathematics performance**



Note: Statistically significant gender differences are marked in a darker tone (see Annex A3). Countries are ranked in ascending order of the score point difference (girls-boys).

Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3.12, available at *http://dx.doi.org/10.1787/888932343152*.

What can students do in science?

- *On average across OECD countries, 18% of 15-year-olds do not attain the baseline proficiency Level 2 in science, while more than 8% of students are top performers at Level 5 or 6.*
- *In 7 countries and economies, more than 90% of students reach at least Level 2, but in 13 countries only a minority does so.*
- *In Finland, New Zealand, the partner economy Shanghai, China and the partner country Singapore, at least 17% of students are top performers at Level 5 or 6 – twice the OECD average.*

What it means

Students whose proficiency in science is limited to Level 1 will find it difficult to participate fully in society at a time when science and technology play a large role in daily life. Those students capable of the advanced scientific thinking required at Levels 5 and 6 could become part of a corps of future innovators who will boost their countries' technological and innovative capacities in science-related industries.

Findings

On average in OECD countries, over four in five students (82%) are proficient in science to at least the baseline Level 2. At that level, students have adequate scientific knowledge to provide possible explanations in familiar contexts or draw conclusions based on simple investigations. In Canada, Estonia, Finland, Korea and the partner economies Hong Kong, China; Macao, China and Shanghai, China; over 90% of students reach Level 2 or above; but in 13 partner countries, only a minority of students reaches Level 2.

At the other end of the scale, one in twelve students (8.5%), on average in OECD countries, is proficient at Level 5 or 6. These top performers are capable of applying scientific knowledge and skills to a variety of complex scientific questions drawn from the real world. In Finland, New Zealand, the partner economy Shanghai, China and the partner country Singapore, between 17% and 25% of students reach at least Level 5, which means that the pool of future workers with high proficiency in science is over twice that of the average OECD country. Among these high performers, only a small minority of 15-year-olds (1% in OECD countries) can perform the most difficult science tasks, at Level 6. These tasks require advanced scientific thinking and reasoning. However, in the partner country Singapore, 5% of students perform at Level 6 and in New Zealand and the partner economy Shanghai, China, 4% of students reach this level.

On the other hand, some countries have almost no students at these levels: in Mexico and in 15 partner countries, less than 1% of students reach Level 5.

Definitions

In PISA, science tasks are ranked by difficulty and are associated with each of the six proficiency levels from 1 (easiest) to 6 (hardest). A student reaches a given proficiency level if the test results show that he or she has at least a 50% chance of performing a task at that level. Students are classified at the highest level at which they are proficient.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

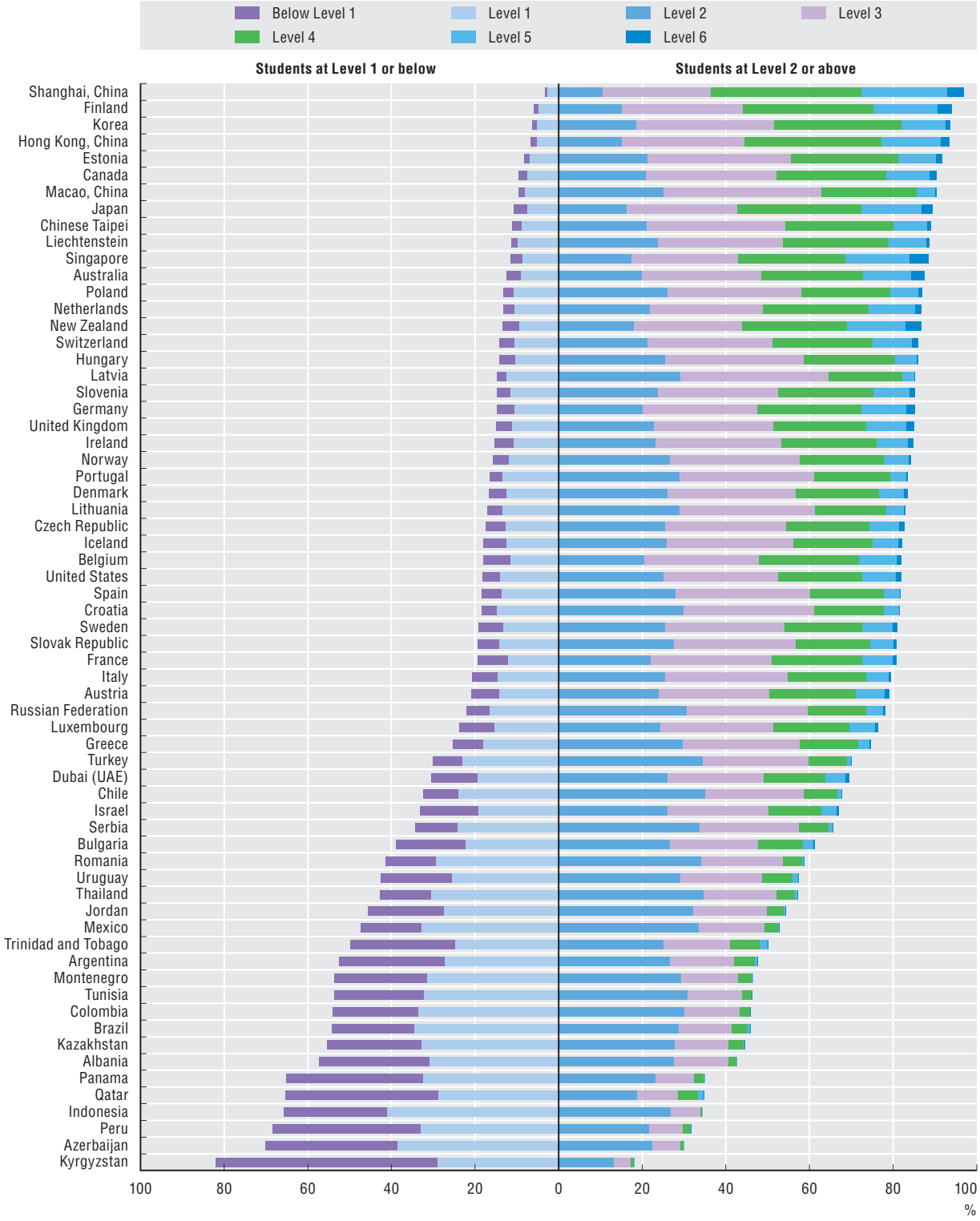
Descriptions of what students can do at each proficiency level and examples of tasks are presented in Chapter 3 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Table I.3.4 at the back of that volume.

Further reading from the OECD

Student performance in science was assessed in depth in 2006, and will be again in 2015. See: *Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006* (2006) and *PISA 2006, Science Competencies for Tomorrow's World, Volume 1: Analysis* (2007).

Figure 1.7. **How proficient are students in science?**

Percentage of students at the different levels of science proficiency



Note: Countries are ranked in descending order of the percentage of students at Levels 2, 3, 4, 5 and 6.

Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3.20, available at *http://dx.doi.org/10.1787/888932343152*.

How do countries/economies perform in science overall?

- *The partner economy Shanghai, China shows the highest average score in science among countries participating in PISA 2009 – well above the next four highest-ranking countries and economy: Finland; Hong Kong, China; Singapore and Japan.*
- *In most OECD countries, students perform on average at Level 3 in science, but in partner countries and economies, the average varies widely, from Level 1 to Level 4.*
- *Eight out of the ten highest performers in science are East Asian and English-speaking countries and economies.*

What it means

The mean PISA science score for each country/economy summarises the performance of students overall. The results show that overall science performance varies widely across countries and economies. In a world where science plays an important part in daily life, countries strive to ensure that their populations attain at least a baseline level of proficiency in science. To be able to compete in the global marketplace, countries must also develop a corps of people capable of complex and innovative scientific thinking.

Findings

The partner economy Shanghai, China ranks first in science proficiency; Finland and the partner economy Hong Kong, China share second place. Differences among the remaining seven highest-performing countries – Australia, Canada, Estonia, Japan, Korea, New Zealand and the partner country Singapore – are, in many cases, too close to be statistically significant. Students in nine of the ten top-performing countries and economies score more than one-third of a proficiency level above the OECD average, with Shanghai, China scoring one proficiency level above the average.

Belgium, Germany, Ireland, the Netherlands, Poland, Slovenia, Switzerland, the United Kingdom and the partner countries and economy Chinese Taipei; Liechtenstein and Macao, China also perform significantly above the OECD average.

Overall, the range in country performance is particularly wide among partners countries, but much less so among OECD countries. In 28 out of the 34 OECD countries, students are proficient to Level 3, on average, in science. Average performance among partner countries and economies ranges from Level 4 in Shanghai, China to Level 1 – and, in the case of Kyrgyzstan, below Level 1 – in 12 countries. At Level 1, students have limited knowledge about science that they can only apply in familiar situations. At Level 4, students can select and integrate explanations from different disciplines of science or technology and link them directly to real-life situations.

Definitions

In the 2006 PISA survey, the first where student performance in science was assessed in detail, the mean science score was set at 500 points for those OECD countries taking part. In 2009, the average score was 501 points among the participating OECD countries. The original PISA scale was set such that approximately two-thirds of students across OECD countries score between 400 and 600 points. A gap of 75 points in science scores is equivalent to one proficiency level.

The averages shown here are estimates based on the PISA sample. In many cases, differences between countries/economies are too close to be statistically significant. In such cases, it cannot be said which of a pair of countries/economies has students with higher average performance.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

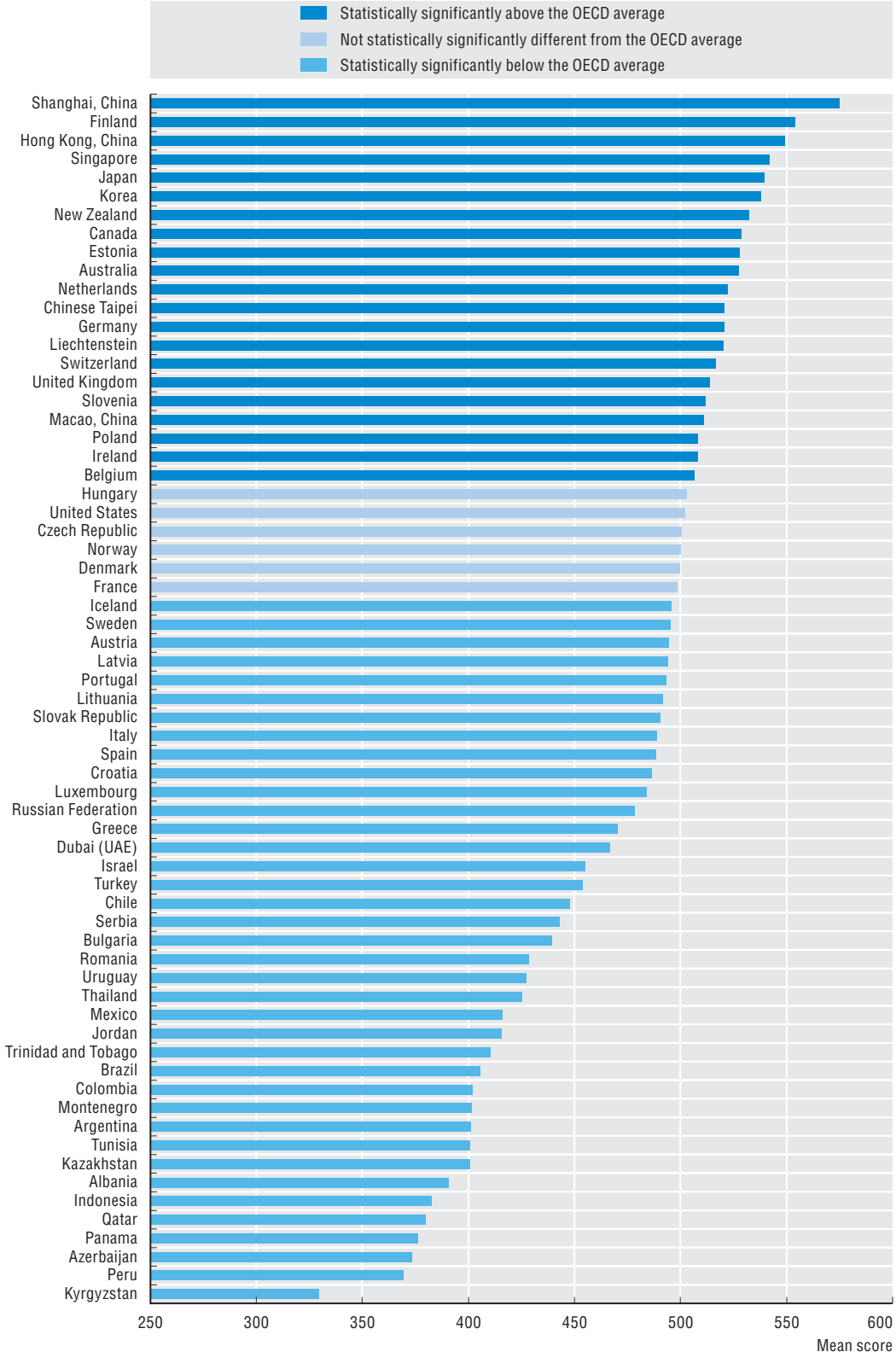
Going further

A full set of comparisons across countries and economies, showing in which cases differences between mean performance are statistically significant, can be found in Chapter 3 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*.

Further reading from the OECD

Student performance in science was assessed in depth in 2006, and will be again in 2015. See: *Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006* (2006) and *PISA 2006, Science Competencies for Tomorrow's World, Volume 1: Analysis* (2007).

Figure 1.8. **Comparing performance in science**



Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3.21, available at *http://dx.doi.org/10.1787/888932343152*.

How do girls compare to boys in science?

- *Girls outperform boys in science in 21 of the 65 countries and economies that participated in PISA 2009; in 11 countries, boys outperform girls, and in 33 countries there is no significant difference in performance between the genders.*
- *On average in OECD countries, boys and girls perform about the same in science.*
- *In the partner countries and economy Albania, Dubai (UAE), Jordan and Qatar, girls outperform boys in science by more than one-third of a proficiency level.*

What it means

Reaching a basic understanding of scientific principles is now essential for both boys and girls if they want to participate fully in society. Despite the prevalence of stereotyping to the contrary, PISA results show that being proficient in science is not linked to one gender or the other.

Findings

Of the three subjects assessed by PISA, reading, mathematics and science, science is the one in which gender gaps in performance are narrowest. On average across OECD countries, boys and girls achieve the same scores. Boys outperform girls in 11 countries, girls outperform boys in 21, and in the remaining countries that participated in PISA 2009, there is no significant difference in science performance between boys and girls. This suggests that science is a domain where policies that focus on gender equality have succeeded the most.

Girls score substantially higher in science, by more than 20 points in 4 partner countries and one partner economy: Albania, Dubai (UAE), Jordan, Kyrgyzstan and Qatar. Only in the partner country Colombia do boys score at least 20 points higher than girls. Among OECD countries, the largest differences in performance between genders, between 10 and 20 points, are seen in Finland, Slovenia and Turkey, where girls outperform boys, and in Denmark and the United States, where boys outperform girls. In countries with the strongest performance in science, boys and girls generally do equally well. Among the top ten countries in science performance, only in Finland and New Zealand is there a significant difference between boys' and girls' science scores. Among the 21 countries whose science performance is above the OECD average, there is a gender gap of 10 points or more only in Finland, Slovenia and the partner country Liechtenstein.

In OECD countries, slightly more boys than girls attain a high level of performance in science: 8% of girls and 9% of boys reach proficiency Level 5 or 6.

A previous, more detailed assessment of science, conducted in 2006, showed some gender difference in particular aspects of science performance. Girls were relatively stronger at identifying scientific issues, while boys were better at explaining phenomena scientifically.

Definitions

The gender gap measures the difference between the mean performance scores of boys and girls in science. On the PISA science scale, the mean score for OECD countries was originally set at 500 points, and around two-thirds of students in OECD countries score between 400 and 600 points. One proficiency level is equivalent to 75 score points.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

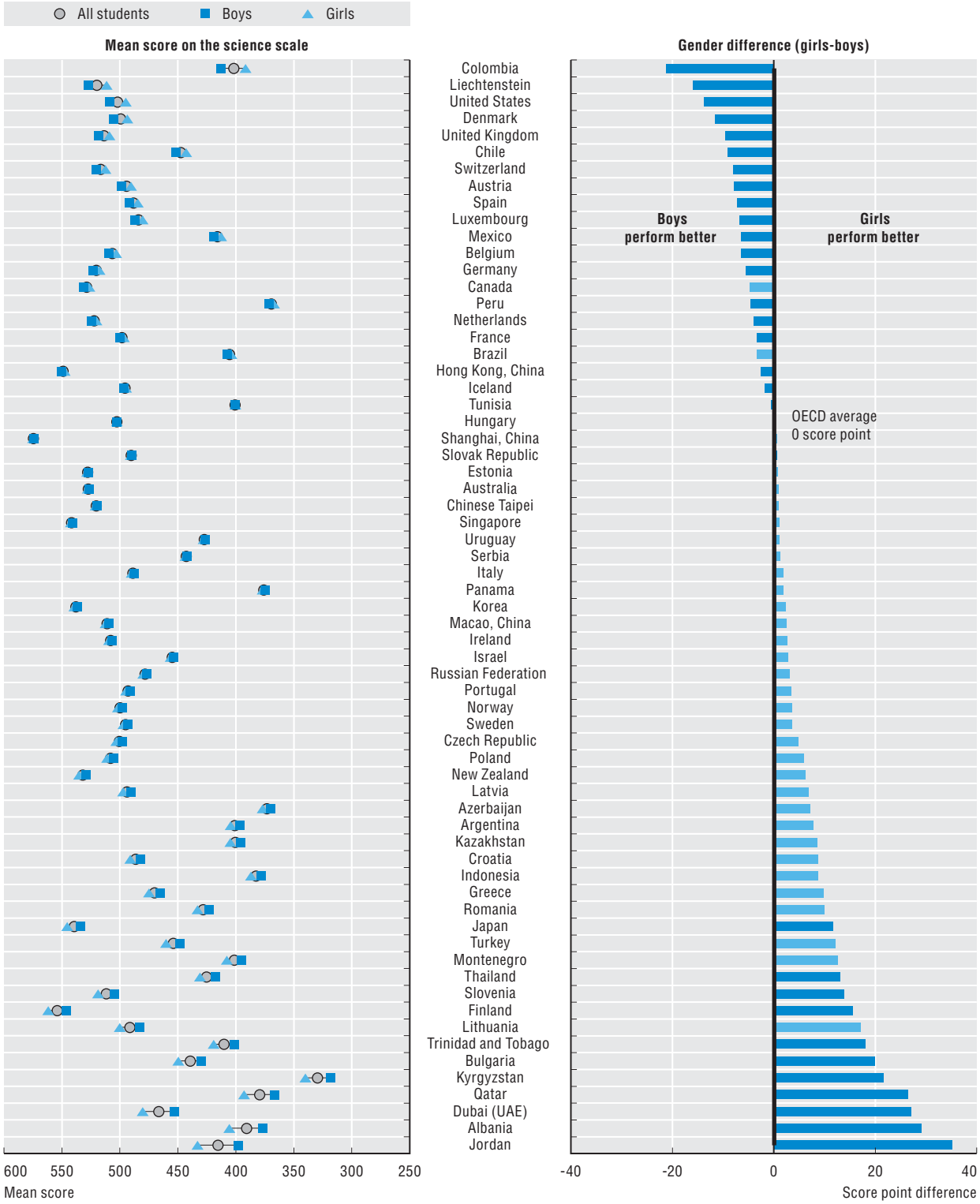
Going further

A full set of comparisons across countries and economies, showing details of gender differences in science performance, is presented in *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Tables I.3.6 (mean scores) and I.3.5 (proficiency levels) at the back of that volume.

Further reading from the OECD

Science performance, including gender differences in different aspects of science, was assessed in depth in 2006, and will be again in 2015. See: *Assessing Scientific, Reading and Mathematical Literacy: A Framework for PISA 2006* (2006) and *PISA 2006, Science Competencies for Tomorrow's World, Volume 1: Analysis* (2007).

Figure 1.9. **Gender differences in science performance**



Note: Statistically significant gender differences are marked in a darker tone (see Annex A3). Countries are ranked in ascending order of the score-point difference (girls-boys).

Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3.23, available at *http://dx.doi.org/10.1787/888932343152*.

How many students are top performers?

- *One in six students in OECD countries is a top performer in reading, mathematics or science, but only a quarter of these students are top performers in all three areas.*
- *Around 10% of students are top performers in reading, mathematics and science in New Zealand, the partner economy Shanghai, China and the partner country Singapore.*
- *Countries vary greatly in the relative numbers of top performers in different subjects.*

What it means

The rapidly growing demand for highly skilled workers has led to a global competition for talent. High-level skills are critical for creating new technologies and innovation. Looking at the top-performing students in reading, mathematics and science allows countries to estimate their future talent pool, and to consider ways of improving it.

Findings

On average in OECD countries, 8% of students reach proficiency Level 5 or 6 in reading. Some 13% of students reach this level in mathematics and 9% reach this level in science. While 16% of students are top performers in at least one area, only 4% of students attain this level of proficiency in all three subjects.

In the partner economy Shanghai, China and in Singapore, 12% to 15% of students are top performers in all three subjects – at least three times the OECD average. In New Zealand, 10% of students are top performers in all three subjects, and in Australia, Finland, Japan and the partner economy Hong Kong, China, more than 8% of students, or twice the OECD average, are.

Despite similarities across countries for each subject area, a high rank in one subject is no guarantee for a high rank in the others. For example, Switzerland has one of the highest shares of top performers in mathematics, but just an average share of top performers in reading.

Across the three subjects and across countries, girls are as likely to be top performers as boys. On average across OECD countries, the proportion of top performers across the three subject areas is similar between boys and girls: 4.4% of girls and 3.8% of boys are top performers in all three subject areas, and 15.6% of girls and 17.0% of boys are top performers in at least one subject area. However, while the gender gap among students who are top performers is small only in science (1.0% of girls and 1.5% of boys), it is large among those who are top performers in reading only (2.8% of girls and 0.5% of boys) and in mathematics only (3.4% of girls and 6.6% of boys).

Definitions

Top performance is defined as reaching Level 5 or 6 on the PISA scales. In each subject area, this relates to being proficient in difficult tasks that require students to handle complex information. The threshold scores for top performance are slightly different in each subject: 626 points in reading, 607 points in mathematics and 633 points in science.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

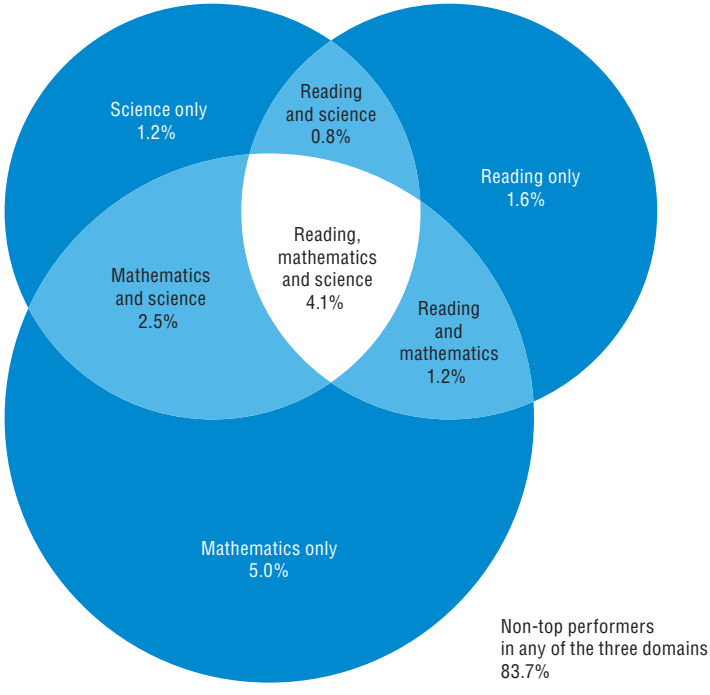
Going further

A full set of comparisons across countries and economies, showing how many students are top performers in each subject and in overlapping combinations of subjects, is presented in Chapter 3 of *PISA 2009 Results Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*. Full data are shown in Tables I.3.7 and I.3.8 at the back of that volume.

Further reading from the OECD

Top of the Class – High Performers in Science in PISA 2006 (2009).

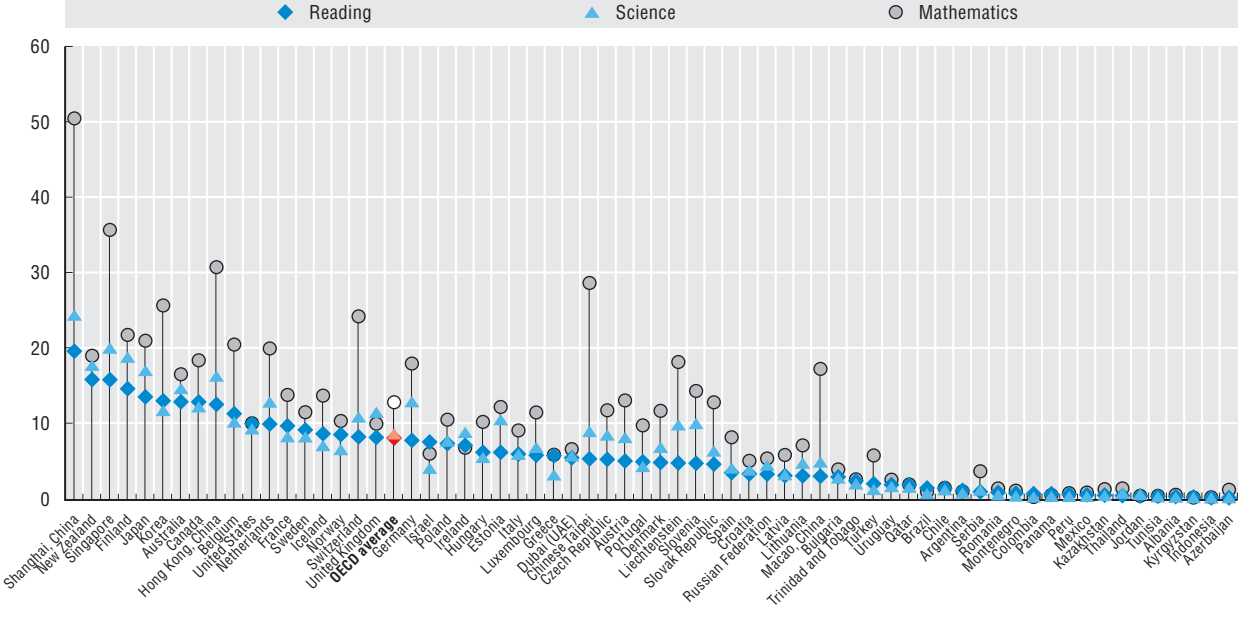
Figure 1.10. **Overlapping of top performers in reading, mathematics and science on average in the OECD**



Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3a, available at *http://dx.doi.org/10.1787/888932343152*.

Figure 1.11. **Top performers in reading, mathematics and science**

Percentage of students reaching the two highest levels of proficiency



Note: Countries are ranked in descending order of the percentage of top performers in reading (Levels 5 and 6).

Source: OECD (2010), *PISA 2009 Results, Volume I, What Students Know and Can Do: Student Performance in Reading, Mathematics and Science*, Figure I.3a, available at *http://dx.doi.org/10.1787/888932343152*.

Performance in reading since 2000

- *Between PISA 2000 and PISA 2009, reading performance improved in 13 countries, declined in 4 and was unchanged in 21.*
- *Among countries that performed above the OECD average in 2000, Korea's reading scores improved, while those of Australia, Ireland and Sweden declined.*
- *The four countries that show the greatest improvement in reading scores, Chile and the partner countries Albania, Peru and Indonesia, all performed far below the OECD average in 2000.*

What it means

In the past decade, most countries have substantially increased their investment in education. PISA helps to monitor whether outcomes are improving as a result. In 2009, PISA focused on reading for the first time since the original PISA survey in 2000. This allows for a comparison of how student performance has evolved over the past decade.

Findings

Mean reading performance remained unchanged, on average, across the 26 OECD countries with comparable results in both the 2000 and the 2009 PISA reading assessments. Reading performance improved in seven of these countries and in six partner countries, and declined in four OECD countries. In the rest of the 38 countries that participated in both surveys, there was no significant change.

Among the four countries showing the greatest improvement, average reading performance had been very low in 2000. Chile's mean score in 2000 was at the bottom of the baseline reading proficiency Level 2, that of the partner countries Albania and Indonesia was at Level 1, and that of the partner country Peru stood below Level 1. The reading scores of 15-year-olds rose by 31 to 43 points in these four countries, or around half a proficiency level. This is a substantial achievement in just nine years. For example, with the improvement, the gap between Chile's mean score and the OECD average was nearly halved.

Among the other nine countries showing improvement in reading scores, seven had performed somewhat below the OECD average in 2000, with mean scores in the upper half of proficiency Level 2 or the very bottom of Level 3. Of these below-average performers in 2000, Poland and the partner country Liechtenstein attained above-average scores in 2009, Germany, Hungary and Portugal reached the OECD average, and Israel and the partner country Latvia were still below the OECD average but had closed over half the gap. The partner country Brazil also improved, even though it remains more than one proficiency level below the OECD average.

Korea, which was already an above-average performer in 2000, improved its mean score to equal that of the top-performing OECD country in reading, Finland.

Among countries whose reading performance declined, two had been among the top five performers in PISA 2000: Ireland, whose scores fell to the OECD average, and Australia, which remained above average. Sweden had performed above the OECD average in 2000, but showed average performance in 2009. In the Czech Republic, mean scores were just below the average in 2000, and fell further below average in 2009.

Definitions

Changes in mean PISA reading scores are reported here only where they are statistically significant. Only those 38 countries with comparable results in both the 2000 and the 2009 PISA reading assessments are considered in this section.

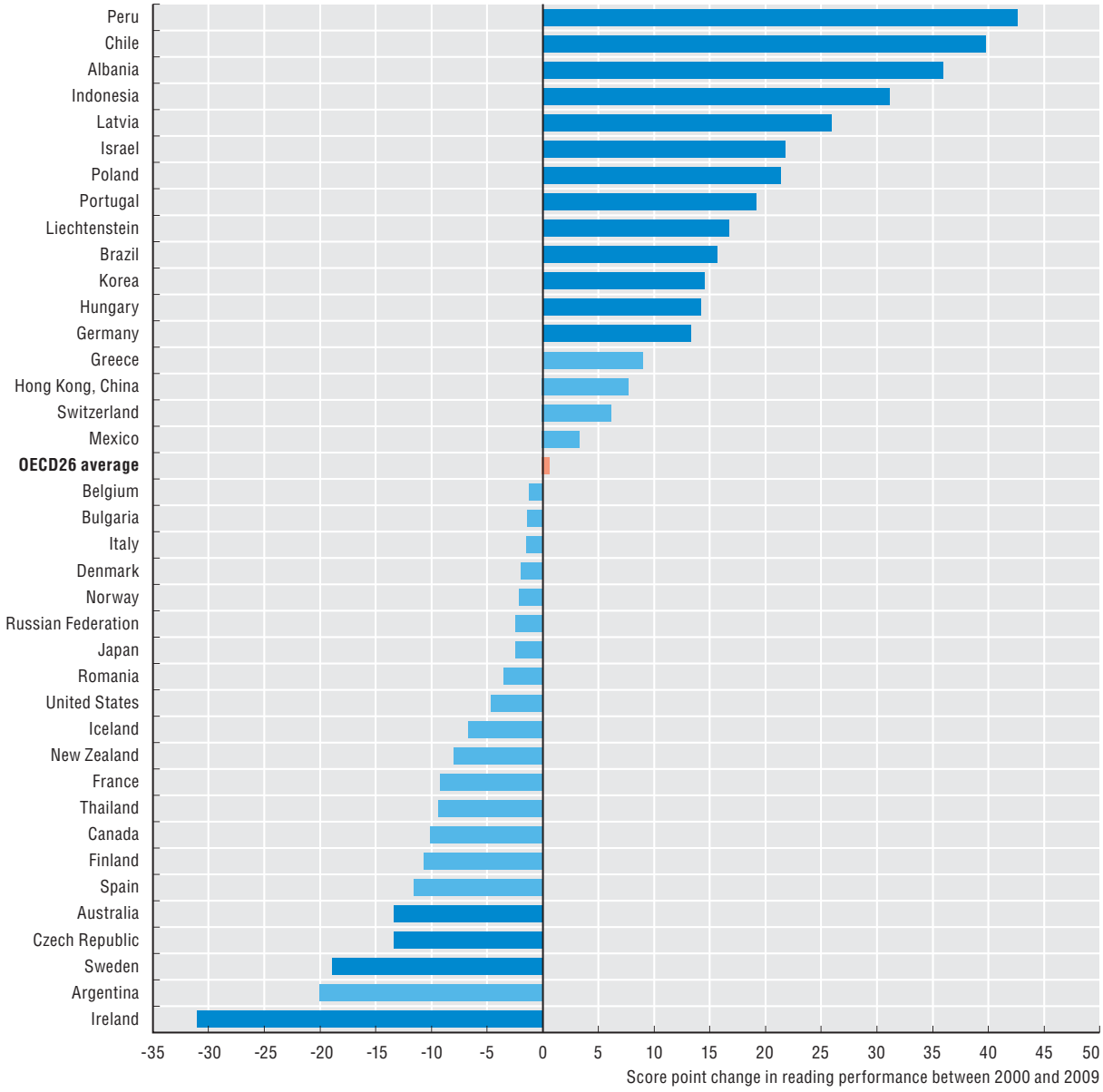
The different number of OECD countries participating in successive PISA assessments is reflected through separate OECD averages that provide reference points for trend comparisons. For reading, the main reference point is the OECD average for the 26 OECD countries that participated in both PISA 2000 and PISA 2009. Among OECD countries, the Slovak Republic and Turkey joined PISA in 2003, and results from Luxembourg, the Netherlands, the United Kingdom and Austria are not comparable between 2000 and 2009. Estonia and Slovenia only participated in 2006 and 2009.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in reading performance between 2000 and 2009 is presented in *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.2.1 at the back of that volume.

Figure 1.12. **Change in reading performance between 2000 and 2009**



Note: Statistically significant score point changes are marked in a darker tone. Countries are ranked in descending order of the score point change in reading performance between 2000 and 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.2.1, available at *http://dx.doi.org/10.1787/888932359967*.

Changes in reading scores since 2000

- *In countries where reading improved overall between 2000 and 2009, girls' scores generally rose more than those of boys.*
- *In most countries that saw improvements in reading performance, the number of low-performing students fell sharply; but in only two countries, Israel and Korea, were there also substantially more top performers.*
- *In several countries, the impact of socio-economic background on reading performance weakened significantly.*

What it means

Nearly a decade after the first PISA survey, countries can see not just whether they have raised standards overall, but also whether they have succeeded in raising performance among various groups.

Findings

Changes in reading performance between 2000 and 2009 were not the same across all groups of students or all levels of proficiency.

Boys' reading scores rose in only five countries, compared to 13 countries where girls' reading scores improved. In most countries where reading performance improved overall, girls' performance improved more than boys' did – around twice the rise in score points or more in Israel, Korea, Poland, Portugal and the partner country Brazil. However, in Chile, and the partner countries Albania and Peru, boys made great strides in reading, improving by at least 35 points, or over half a proficiency level.

Conversely, boys' reading performance declined in eight countries, while girls' reading performance declined in only two. In Ireland, boys scored 37 points lower in 2009 than in 2000, falling, on average, from the middle of proficiency Level 3 to the top of Level 2.

Rises in mean country scores were more often driven by a reduction in the proportion of low-performing students than by an increase in the proportion of top performers. The percentage of students who do not reach the baseline proficiency Level 2 fell in 14 countries. In Chile and the partner countries Albania, Indonesia, Latvia and Peru, this fall was substantial: between 12 and 18 percentage points. But only six countries showed a rise in the number of students reaching Level 5 or above; and in only Israel, Japan, Korea and the partner economy Hong Kong, China was this rise greater than one percentage point. Of these, only Israel and Korea showed overall improvements in reading performance. In most countries that showed overall declines in reading performance, the number of top performers fell and the number of low performers rose significantly. The exception was Australia, where the proportion of top performers fell sharply, from 18% to 13%, but the proportion of low performers did not change significantly.

Between 2000 and 2009, the relationship between student background and reading performance weakened in nine countries, including three of the five countries where reading scores improved the most – Chile and the partner countries Albania and Latvia. Germany is the only other country where the relationship weakened while performance improved. On the other hand, the relationship appears to be stronger in five countries.

Definitions

Level 2 is considered the baseline level of proficiency in reading, at which students begin to demonstrate the competencies that will enable them to participate effectively and productively in life. PISA tasks at this level may involve comparisons or contrasts based on a single feature in a text. They may also require students to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes. Top performers are those students who attain proficiency Level 5 or 6, the highest levels of performance.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

More detailed information on how reading performance has evolved between 2000 and 2009 is provided in Chapter 2 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance since 2000*.

Table 1.1. **A summary of changes in reading performance**

	Mean score in reading 2009	All students	Boys	Girls	Share of students below proficiency Level 2	Share of students at proficiency Level 5 or above	Association of socio-economic background with reading performance
Peru	370	43	35	50	–14.8	0.4	0.1
Chile	449	40	42	40	–17.6	0.8	–7.6
Albania	385	36	35	39	–13.7	0.1	–9.9
Indonesia	402	31	23	39	–15.2		–6.9
Latvia	484	26	28	23	–12.5	–1.2	–11.0
Israel	474	22	9	35	–6.7	3.3	–8.4
Poland	500	21	14	28	–8.2	1.3	–1.5
Portugal	489	19	12	26	–8.6	0.6	–4.7
Liechtenstein	499	17	16	17	–6.4	–0.4	–13.3
Brazil	412	16	9	21	–6.2	0.8	–0.6
Korea	539	15	4	25	0.0	7.2	8.5
Hungary	494	14	11	17	–5.1	1.0	–4.2
Germany	497	13	10	15	–4.2	–1.2	–7.7
Greece	483	9	3	13	–3.1	0.6	2.0
Hong Kong, China	533	8	0	17	–0.8	2.9	–8.6
Switzerland	501	6	1	10	–3.6	–1.1	–2.3
Mexico	425	3	1	6	–4.0	–0.5	–7.3
Belgium	506	–1	0	–5	–1.2	–0.8	0.7
Bulgaria	429	–1	–8	6	0.7	0.6	–4.5
Italy	486	–1	–5	2	2.1	0.5	3.2
Denmark	495	–2	–5	–1	–2.7	–3.4	–3.2
Norway	503	–2	–5	–1	–2.5	–2.8	0.4
Russian Federation	459	–2	–6	1	–0.1	0.0	1.4
Japan	520	–2	–6	3	3.5	3.6	c
Romania	424	–3	–18	11	–0.9	–1.5	10.7
United States	500	–5	–2	–6	–0.3	–2.4	–9.2
Iceland	500	–7	–10	–6	2.3	–0.5	5.4
New Zealand	521	–8	–8	–8	0.6	–3.0	4.9
France	496	–9	–15	–4	4.6	1.1	7.0
Thailand	421	–9	–6	–10	5.8	–0.2	–0.7
Canada	524	–10	–12	–10	0.7	–4.0	–6.4
Finland	536	–11	–12	–8	1.2	–4.0	5.8
Spain	481	–12	–14	–10	3.3	–0.9	1.5
Australia	515	–13	–17	–13	1.8	–4.9	–1.4
Czech Republic	478	–13	–17	–6	5.6	–1.9	–11.4
Sweden	497	–19	–24	–15	4.9	–2.2	7.7
Argentina	398	–20	–15	–22	7.7	–0.7	–1.7
Ireland	496	–31	–37	–26	6.2	–7.3	5.8

Mean score in reading 2009 is statistically significantly above the OECD average. Changes in reading performance and in the share of students at proficiency Level 5 or above are statistically significantly positive. Changes in the share of students below proficiency Level 2 and in the association of socio-economic background with reading is statistically significantly negative.

Mean score in reading 2009 is not statistically significantly different from the OECD average. Changes in reading performance and in the share of students at proficiency Level 5 or above, in the share of students below proficiency Level 2 and in the association of socio-economic background with reading are not statistically significantly different.

Mean score in reading 2009 is statistically significantly below the OECD average. Changes in reading performance and in the share of students at proficiency Level 5 or above are statistically significantly negative. Changes in the share of students below proficiency Level 2 and in the association of socio-economic background with reading is statistically significantly positive.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.1.1, available at *http://dx.doi.org/10.1787/888932359948*.

Reading scores among low-performing students

- *In four countries that showed low levels of performance in 2000, the proportion of low-performing students had fallen sharply by 2009.*
- *During this period, Germany, Hungary, Poland, Portugal, Switzerland and the partner countries Latvia and Liechtenstein reduced the proportion of low-performing students to below or close to the OECD average.*
- *In the Czech Republic, France and Spain, the number of low-performing students rose between 2000 and 2009 to close to or above the OECD average.*

What it means

Particularly in countries where only a minority of students is able to read beyond a basic level, improving performance among low achievers contributes significantly to raising the overall standard. In OECD countries, where the great majority of students reaches at least proficiency Level 2, the challenge is to limit the number of students who do not. In some of these countries, immigration and other changes that affect the socio-economic profile of the student population can make the task more difficult.

Findings

The proportion of students who do not attain the baseline proficiency Level 2 fell significantly in 14 countries and rose in 7 between 2000 and 2009.

The biggest improvements were seen in those countries where underperformance had been the most pervasive. Most notably, in nine years, the proportion of students who did not attain Level 2 fell from 80% to 65% in Peru; from 70% to 57% in Albania; from 69% to 53% in Indonesia; and from 48% to 31% in Chile.

The only other country that showed a drop of at least 10 percentage points in the proportion of low-performing students was the partner country Latvia, where the proportion fell from 30% to 18%, close to the OECD average. There, and in five other below-average performers in 2000 – Germany, Hungary, Poland, Portugal and the partner country Liechtenstein – a reduction in the proportion of low-performing students helped to raise the average score.

In only one country where the percentage of low performers was below average in 2000 – Denmark – did that percentage fall further. In contrast, in the Czech Republic, France, Iceland, Ireland, Spain and Sweden, where fewer students than average or close to average were low performers in reading in 2000, their numbers had risen by 2009.

Definitions

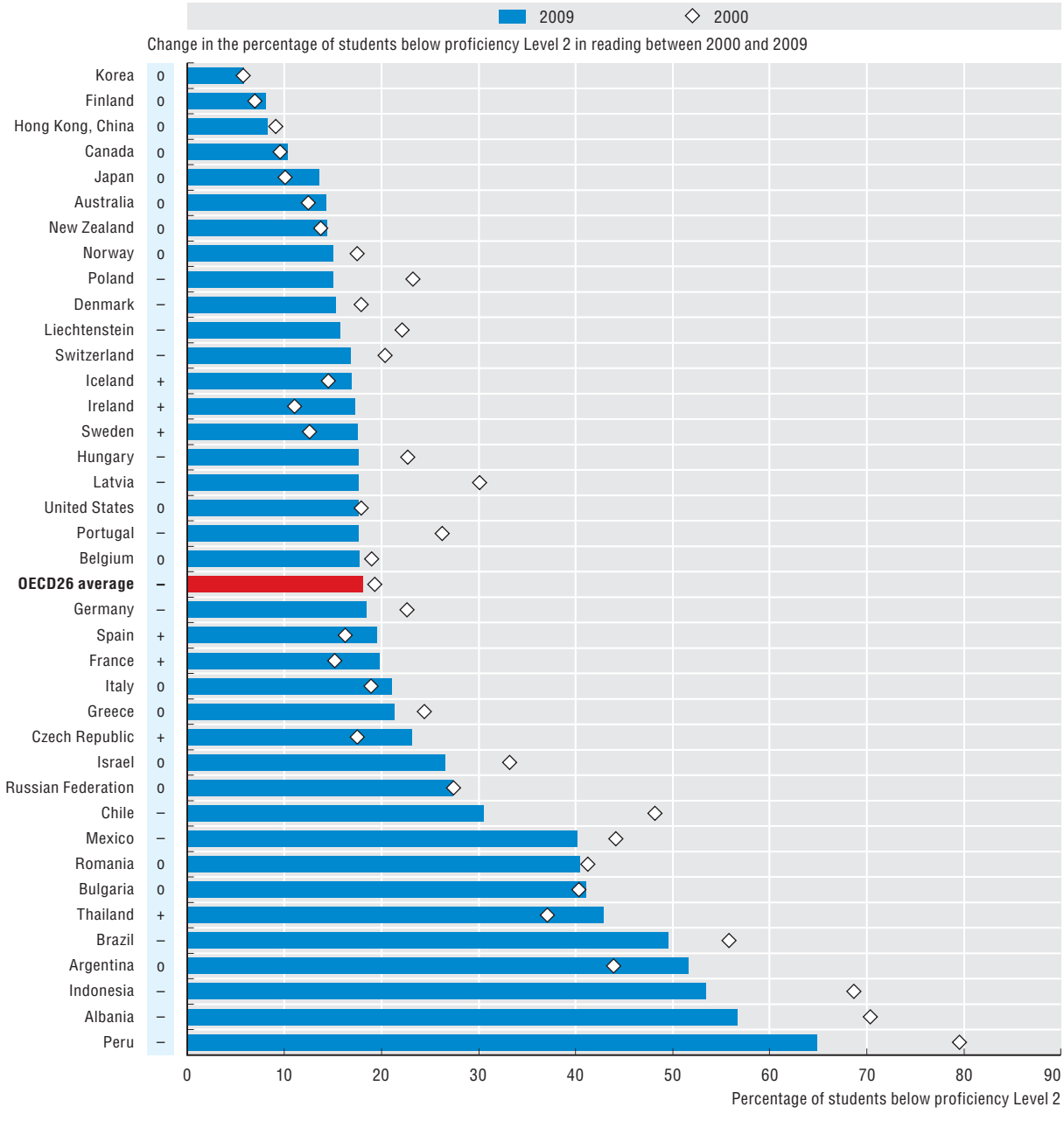
Students are defined as low performers if they do not attain reading proficiency Level 2. The countries involved in this comparison are only those that participated in both PISA 2000 and 2009. Changes in the percentage of low-performing students are only reported if they are statistically significant. They are expressed as "percentage point changes", such that a rise from 5% to 10% is a five percentage point change, even though the proportion has doubled.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in reading performance among low-performing students is presented in Chapter 2 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.2.2 at the back of that volume.

Figure 1.13. **Percentage of students below proficiency Level 2 in reading in 2000 and 2009**



	2009 higher than 2000	2009 lower than 2000	No statistically significant difference
95% confidence level	+	–	o

Note: Countries are ranked in ascending order of the percentage of students below proficiency Level 2 in reading in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.2.4, available at *http://dx.doi.org/10.1787/888932359967*.

Reading scores among high-performing students

– *In Japan, Korea and the partner economy Hong Kong, China, the percentage of top performers in reading rose to among the highest in PISA by 2009, having been only at or below the OECD average in 2000.*

– *The biggest changes in the proportion of top performers in reading are seen in Korea and Israel, which doubled that proportion, and in Ireland, where it halved.*

What it means

The 8% of students capable of performing complex reading tasks at Level 5 or 6 will be at the forefront of a competitive, knowledge-based world economy. Some countries have very few students at these levels, and will need to improve the performance of their best students in order to enhance competitive capacity.

Findings

The proportion of top performers in reading, proficient at Level 5 or above, rose significantly in six countries but fell in ten others between 2000 and 2009.

Three of the four countries that showed the greatest increase in top performers during this period now have among the highest percentage of these students in the world. In 2000, Japan and the partner economy Hong Kong, China had only about the OECD average of 9% of students reading at Level 5 or above; Korea was well below this average, with 6% of top performers. By 2009, between 12% and 13% of students in all these countries were top performers. Korea more than doubled the percentage of top performers in reading in nine years.

Israel also nearly doubled the percentage of top performers in reading, to 7%. While this is close to the OECD average, it is a greater proportion than that found in the other countries whose average reading scores are similar to Israel's.

In the five countries that had the highest proportion of top performers in reading in 2000, this proportion shrunk significantly by 2009. Most notably, the percentage in Ireland halved from 14% to 7%, now close to the OECD average. In Australia, Canada, Finland and New Zealand, far above the average proportion of students performed at Level 5 or 6 in 2000, but this proportion was reduced by between three and five percentage points in 2009. These countries still had well above the average proportion of top performers in 2009, but their advantage over other countries had narrowed.

In Denmark, the proportion of top performers fell sharply from 8% to below 5% during the period. Unusually, Denmark saw a fall in the number of both top and low performers, with more students performing at middle levels of reading proficiency. In Norway, the proportion of top performers decreased by three percentage points, to the average level.

In Romania, the proportion of top performers fell from an already low level of 2% in 2000 to less than 1% in 2009.

Definitions

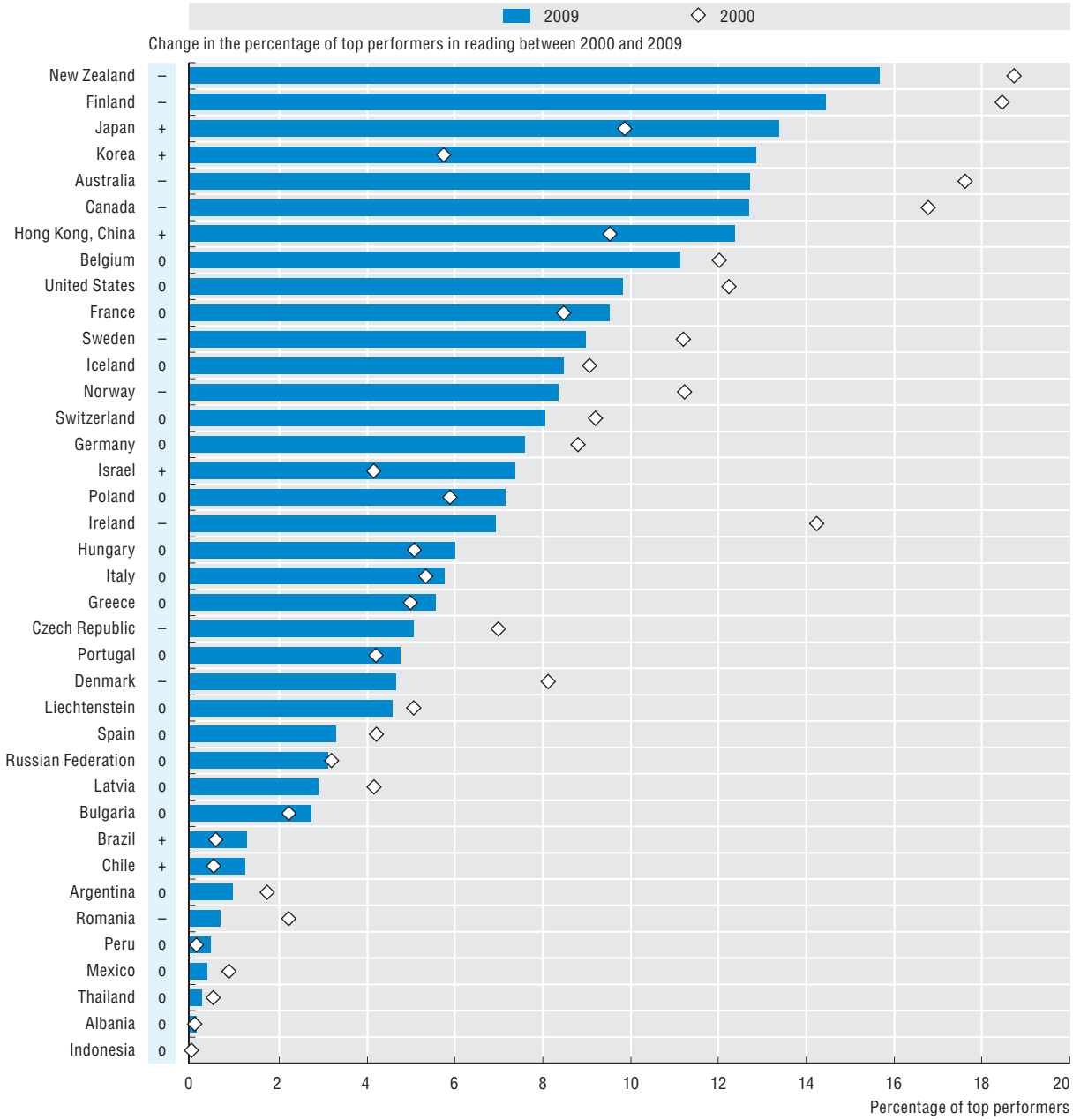
Students are defined as top performers if they are proficient to at least Level 5 on the seven-level reading proficiency scale. The countries involved in this comparison are only those that have comparable results in both the 2000 and the 2009 PISA reading survey. Changes in the percentage of low-performing students are only reported if they are statistically significant. They are expressed as "percentage point changes", such that a rise from 5% to 10% is a five percentage point change, even though the proportion has doubled.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in top performance in reading between 2000 and 2009 is presented in Chapter 2 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.2.2 at the back of that volume.

Figure 1.14. **Percentage of top performers in reading in 2000 and 2009**



	2009 higher than 2000	2009 lower than 2000	No statistically significant difference
95% confidence level	+	–	o

Note: Countries are ranked in descending order of top performers in reading in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.2.5, available at *http://dx.doi.org/10.1787/888932359967*.

Girls' and boys' reading performance since 2000

- *Girls still outperform boys in reading; indeed the gender gap widened by more than one-fifth between PISA 2000 and PISA 2009.*
- *The gender gap widened greatly in nine countries; in no country did it narrow.*
- *In six of these countries, girls' reading performance improved considerably; but in France, Sweden and the partner country Romania, a decline in performance among boys was the main reason that the gender gap widened.*

What it means

With boys lagging behind in reading performance, one way to improve overall results is to get boys more interested and engaged in reading. In the short term, this may require paying more attention to the reading preferences of boys who, for example, show relatively strong interest in reading newspapers and reading on line, rather than aiming for a single model of reading engagement. In the long run, tackling the gender gap in reading performance will require the concerted effort of parents, teachers and society at large to change the stereotypical notions of what boys and girls excel in and what they enjoy doing.

Findings

The gender gap in reading performance did not narrow in any country between 2000 and 2009. On average in OECD countries, girls scored 39 points higher than boys in 2009 compared to 32 points in 2000. This represents a widening of the gender gap of more than 20%.

In Israel, Korea and the partner country Romania, girls outperformed boys by a wider margin – more than 20 score points – in 2009 than they did in 2000. But the reasons behind these changes varied. In Israel and Korea, girls' reading levels rose (by over half a proficiency level in Israel), while boys' reading performance did not improve. In contrast, in Romania, boys' reading performance declined, while girls' performance was similar to that in 2000. In three of the other countries with widening gender gaps, Portugal, the partner country Brazil and the partner economy Hong Kong, China, girls' performance improved while that of boys did not. In the partner countries Indonesia and Peru, both boys and girls improved, but girls did so to a greater extent. In France and Sweden, boys' reading performance declined, but girls' performance either remained the same (France) or also declined (Sweden), although by a lesser degree.

The gender gap is particularly wide in the proportion of low-performing students. In 2009, twice as many boys (24%) as girls (12%) did not attain the baseline reading proficiency Level 2. Across OECD countries, this gap widened since 2000 because of a two percentage point drop in the proportion of girls at this level and no change in the proportion of boys at this level.

The proportion of low-performing boys increased by the largest amount in Ireland, where the proportion rose from one boy in seven (13%) in 2000 to nearly one in four (23%) in 2009.

Definitions

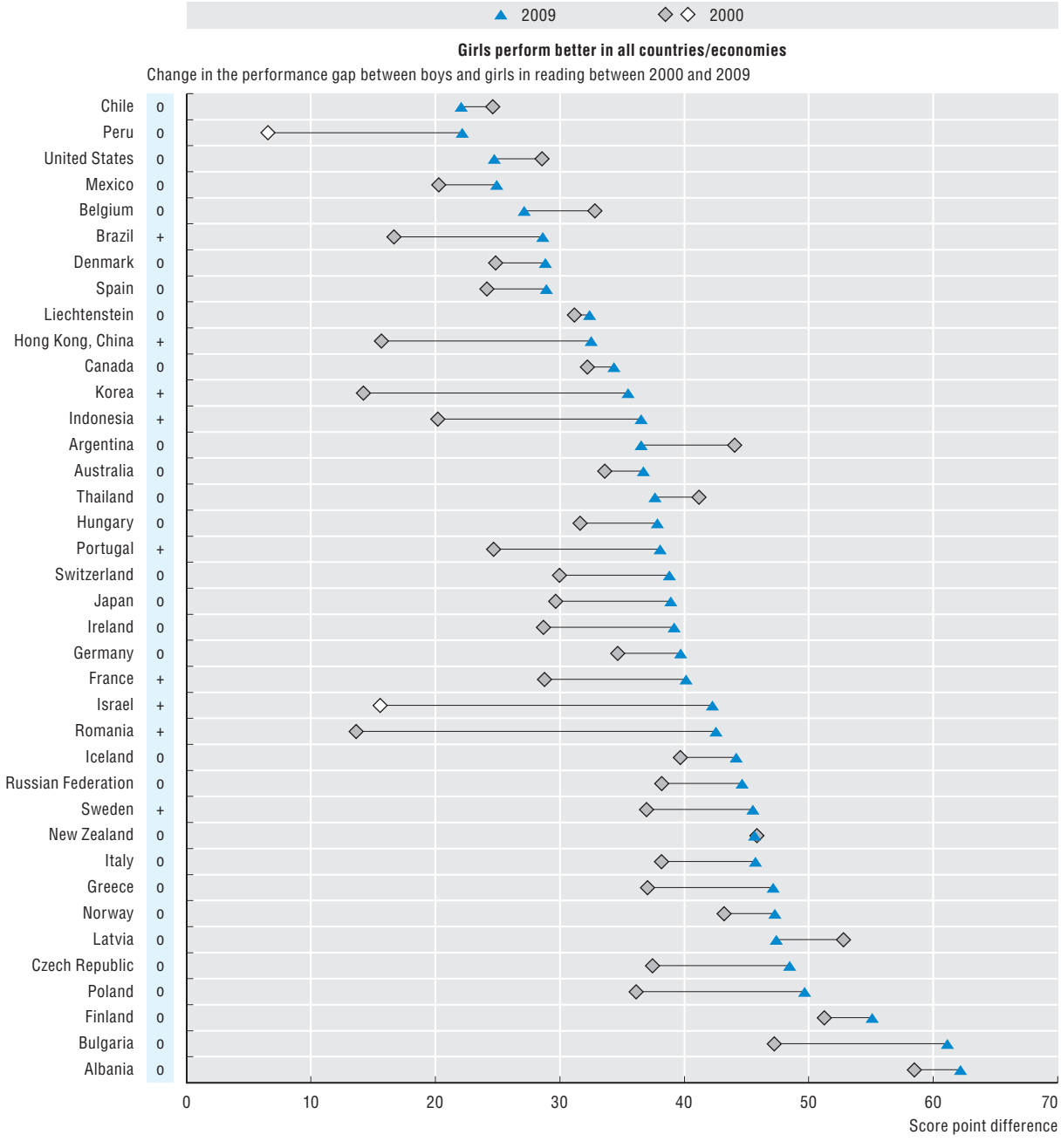
The gender gap is defined as the difference in score points between the average scores of boys and girls. Differences over time are noted only when they are statistically significant.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in the gender gap between 2000 and 2009 is presented in Chapter 2 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Tables V.2.4, V.2.5 and V.2.6 at the back of that volume.

Figure 1.15. **Comparison of gender differences in performance between 2000 and 2009**



Note: All gender differences in PISA 2009 are significant. Gender differences in 2000 that are statistically significant are marked in a darker tone. Countries are ranked in ascending order of gender differences (girls – boys) in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.2.7, available at *http://dx.doi.org/10.1787/888932359967*.

Performance in mathematics since 2003

- *Between PISA 2003 and PISA 2009, mathematics performance improved in 8 countries, declined in 9, and was unchanged in 22.*
- *Seven of the eight countries that showed better performance in mathematics were still well below the OECD average in both 2003 and 2009.*
- *All of the declines in mathematics performance occurred in countries that had scored at or above the OECD average in 2003.*

What it means

Even countries that show improvements in mathematics performance can still perform below the OECD average, while those that show a decline in performance can continue to outperform others. While changes in mean mathematics scores describe overall trends, these data can mask changes among the lowest- and the highest-achieving students.

Findings

Mean mathematics performance remained unchanged, on average, across the 28 OECD countries with comparable results in the PISA 2003 and 2009 surveys. However, it improved in six of these countries and in two partner countries. Mexico and Brazil showed the largest improvements over the period: 33 and 30 score points, respectively, or around half a proficiency level. Mathematics performance declined in nine OECD countries over the same period. In the rest of the 39 countries that have comparable results in both assessments, there was no significant change.

Seven countries that showed the greatest improvement in mathematics performance are still below the OECD average. Of these, Italy and Portugal are now only just below average, Greece is half a proficiency level below, and Mexico, Turkey and the partner countries Brazil and Tunisia are between one and two proficiency levels below average.

In some of these countries, the overall improvement was the result of significant improvements among the lowest-performing students. For example, in Mexico, the percentage of students performing below proficiency Level 2 or below fell from 66% to 51%, and in Turkey it dropped from 52% to 42%.

Germany's mean performance in mathematics improved from OECD average levels in 2003 to above-average levels in 2009.

In eight of the nine countries where mathematics performance declined, students had scored above the OECD average in 2003. Despite a drop of 12 score points, the Netherlands remains among the highest-scoring countries in the PISA mathematics survey. In Australia, Belgium, Denmark and Iceland, mean scores also remained above the OECD average in 2009.

However, in the Czech Republic, France and Sweden, mean performance in mathematics declined from above-average levels in 2003 to around the OECD average in 2009. In Ireland, performance declined from around the OECD average to below average.

Definitions

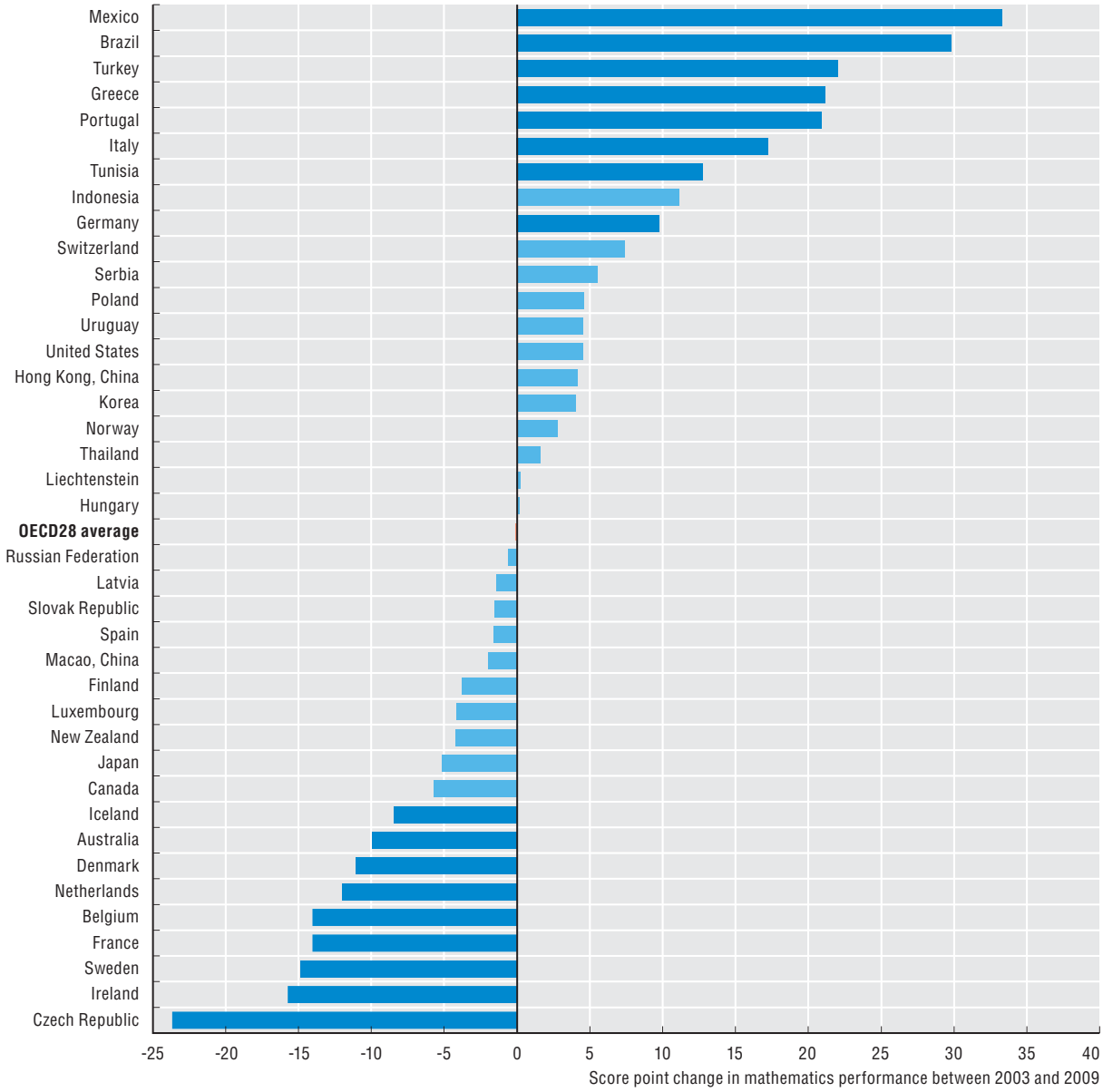
Trends in performance in mathematics are derived by comparing results from PISA 2009 with those from the 2003 and 2006 assessments. Since trends in mathematics start in 2003, as opposed to trends in reading, which start in 2000, performance changes in mathematics since 2003 are expected to be smaller than performance changes in reading since 2000. PISA 2003 provides results in mathematics that were measured with more precision than in PISA 2006 and PISA 2009, since the latter two surveys devoted less testing time to mathematics. Changes in mean PISA mathematics scores are reported here only where they are statistically significant. Not all countries that participated in PISA 2009 had valid results in the PISA 2003 survey too; this section only reports on the 39 countries that did.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in mathematics performance between 2000 and 2009 is presented in *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Tables V.3.1 and V.3.2 at the back of that volume.

Figure 1.16. **Change in mathematics performance between 2003 and 2009**



Note: Statistically significant score point changes are marked in a darker tone. Countries are ranked in descending order of the score point change on the mathematical scale between 2003 and 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.3.1, available at *http://dx.doi.org/10.1787/888932359986*.

Performance in science since 2006

– *Between PISA 2006 and PISA 2009, performance in science improved in 11 countries, declined in 5, and was unchanged in 40.*

– *Nine of the 11 countries that showed improvements in science performance over the period scored below the OECD average in science in both PISA 2006 and PISA 2009.*

– *Four of the five countries that showed declines in science performance over the period had scored above the average in 2006.*

What it means

An understanding of science and technology is central to students' preparedness for life in modern society. It enables them to participate fully in a society in which science and technology play a significant role. PISA results tracked over a period of years show whether school systems are becoming more successful in helping students attain that understanding.

Findings

Mean science performance remained unchanged, on average, across the 33 OECD countries and in 6 of the 23 partner countries and economies with comparable results in the PISA 2006 and PISA 2009 assessments. However, 11 countries saw significant improvements in average science performance, and 5 saw significant declines.

By far the greatest changes were in Turkey and the partner country Qatar. In both these countries, average science scores rose by 30 score points or nearly half a proficiency level – a remarkable improvement in just three years. In both of these countries, the proportion of students who did not attain proficiency Level 2 in science fell sharply, even though these proportions remain high by international standards. In Qatar, the proportion shrank from 79% to 65%, and in Turkey from 47% to 30%.

Of the 11 countries that saw improvements in performance, 9 had performed below the OECD average in 2006, one was close to the average, and the remaining country was above it. However, compared to performance in reading and mathematics, the countries that saw improvements in science scores were spread more widely across the performance range in 2006:

- Korea had performed well above the OECD average in 2006 and, with its improvement, became one of the top performers in science in 2009.
- Poland improved its science performance from around the OECD average to above average.
- Norway and the United States performed below the OECD average in science in 2006, but reached the average in 2009.
- Italy and Portugal improved their mean science scores to just below the OECD average.
- The remaining five countries, Turkey and the partner countries Brazil, Colombia, Qatar and Tunisia, had performed well below the OECD average in 2006.

In the five countries that showed declines in science performance, the drop in score points was relatively small: between 7 and 12 points. Despite a slight decline in performance, Finland was the highest-scoring OECD country in science in 2009. Slovenia and the partner economy Chinese Taipei also showed declines, but remained above the OECD average. In the Czech Republic, science scores dropped from above the OECD average in 2006 to around the average three years later.

Definitions

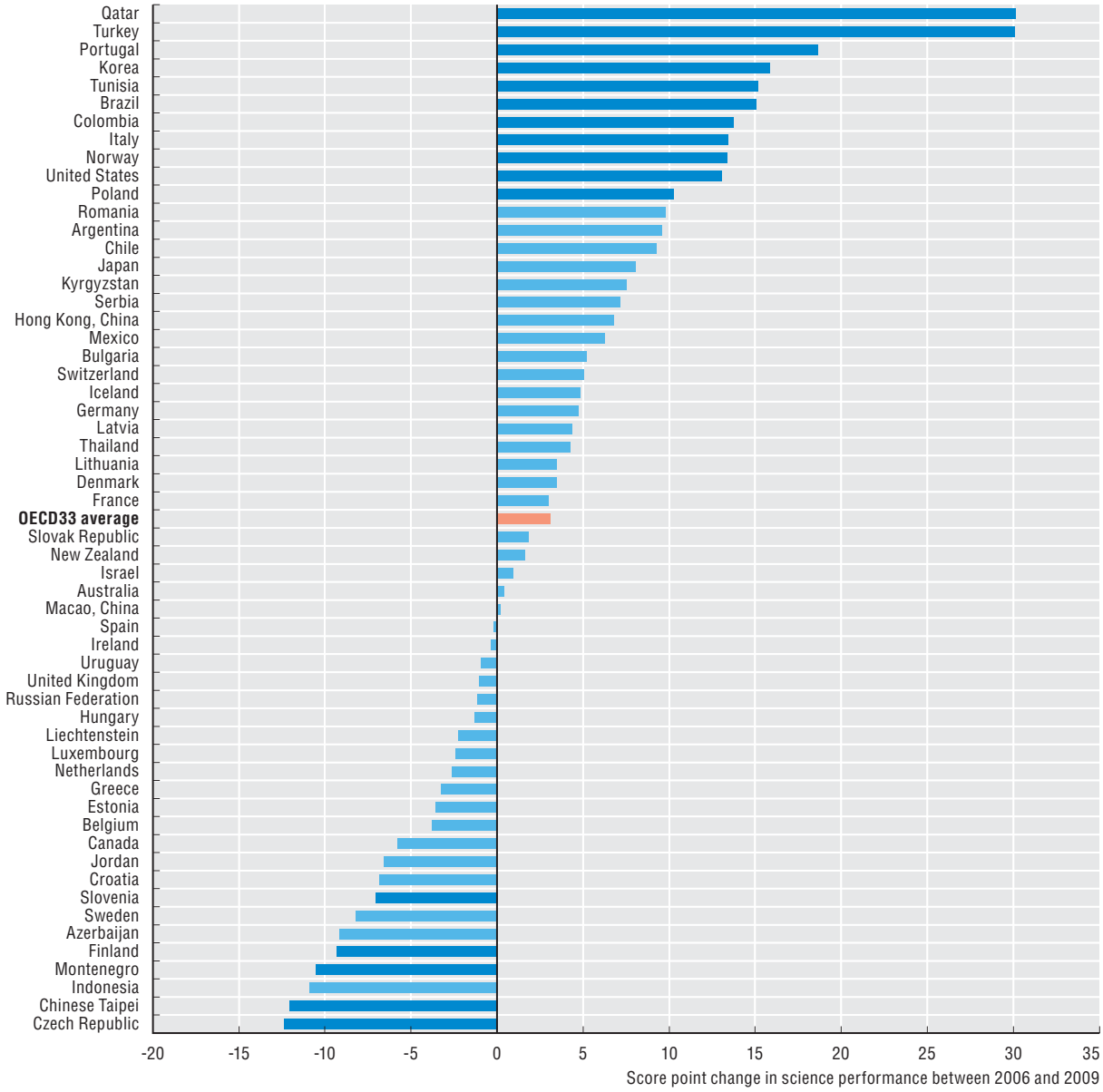
Trends in science performance are derived by comparing results from PISA 2009 with those from the PISA 2006 assessment. Since the trends in science start from 2006, as opposed to the trends in reading, which start from 2000, performance changes in science since 2006 are expected to be smaller than performance changes in reading since 2000, and smaller than performance changes in mathematics since 2003. Changes in mean PISA science scores are reported here only where they are statistically significant. Not all countries participating in PISA 2009 had comparable results in the PISA 2006 survey too; this section only reports on the 56 countries that did.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in science performance between 2000 and 2009 is presented in *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Tables V.3.4 and V.3.5 at the back of that volume.

Figure 1.17. **Change in science performance between 2006 and 2009**



Note: Statistically significant score-point changes are marked in a darker tone. Countries are ranked in descending order of the score point change in science performance between 2006 and 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.3.5, available at *http://dx.doi.org/10.1787/888932359986*.

2. OVERCOMING SOCIAL BACKGROUND

Does socio-economic background affect reading performance?

Can disadvantaged students defy the odds against them?

How do students from single-parent families perform in reading?

How do students with an immigrant background perform in reading?

Does where a student lives affect his or her reading performance?

How equitably are school resources distributed?

Trends

Socio-economic background and reading performance

Relative performance of students from immigrant backgrounds

Does socio-economic background affect reading performance?

- *The average association between socio-economic background and reading performance is strong, particularly in France, New Zealand, the partner country Bulgaria and the partner economy Dubai (UAE).*
- *More than 20% of the variation in reading scores among students in Hungary and the partner countries Bulgaria, Peru and Uruguay is explained by differences in socio-economic background.*
- *The four top-performing countries in reading show a below-average impact of socio-economic background on students' reading performance.*

What it means

In trying to provide students with equitable learning opportunities, education systems aim to reduce the extent to which a student's socio-economic background affects his or her performance in school. Performance differences that are related to student background are evident in every country. But PISA results show that some countries have been more successful than others in mitigating the impact of socio-economic background on students' performance in reading.

Findings

There are two main ways of measuring how closely reading performance is linked to social background. One considers the average gap in performance between students from different socio-economic backgrounds. This gap is greatest in France, New Zealand, the partner country Bulgaria and the partner economy Dubai (UAE), where it is at least 30% wider than the OECD average. In these countries, a student's predicted score is most heavily influenced by his or her socio-economic background.

While this measure can be used to predict differences in reading scores among students from different backgrounds, many students defy these predictions. Socio-economically advantaged students perform better *on average*, but a number perform poorly, just as a number of disadvantaged students perform well. To show the extent to which levels of student performance conform to a pattern predicted by socio-economic status, PISA also measures the *percentage of variation* in reading performance than can be explained by a student's background.

On average across OECD countries, 14% of variation in students' reading performance can be explained by their socio-economic backgrounds. In Hungary and the partner countries Bulgaria, Peru and Uruguay, more than 20% of the variation is so explained. In contrast, in Iceland and the partner country and economies Hong Kong, China; Qatar and Macao, China, less than 7% of the variation in student performance is explained by socio-economic background.

This analysis shows that a student's socio-economic background is associated with his or her reading performance to some extent in all countries. However, in the four countries and economies with the highest reading performance, namely Shanghai, China; Korea; Finland and Hong Kong, China, the link between student background and performance is weaker than on average. This shows that it is possible to achieve the highest levels of performance while providing students with relatively equitable learning opportunities.

Definitions

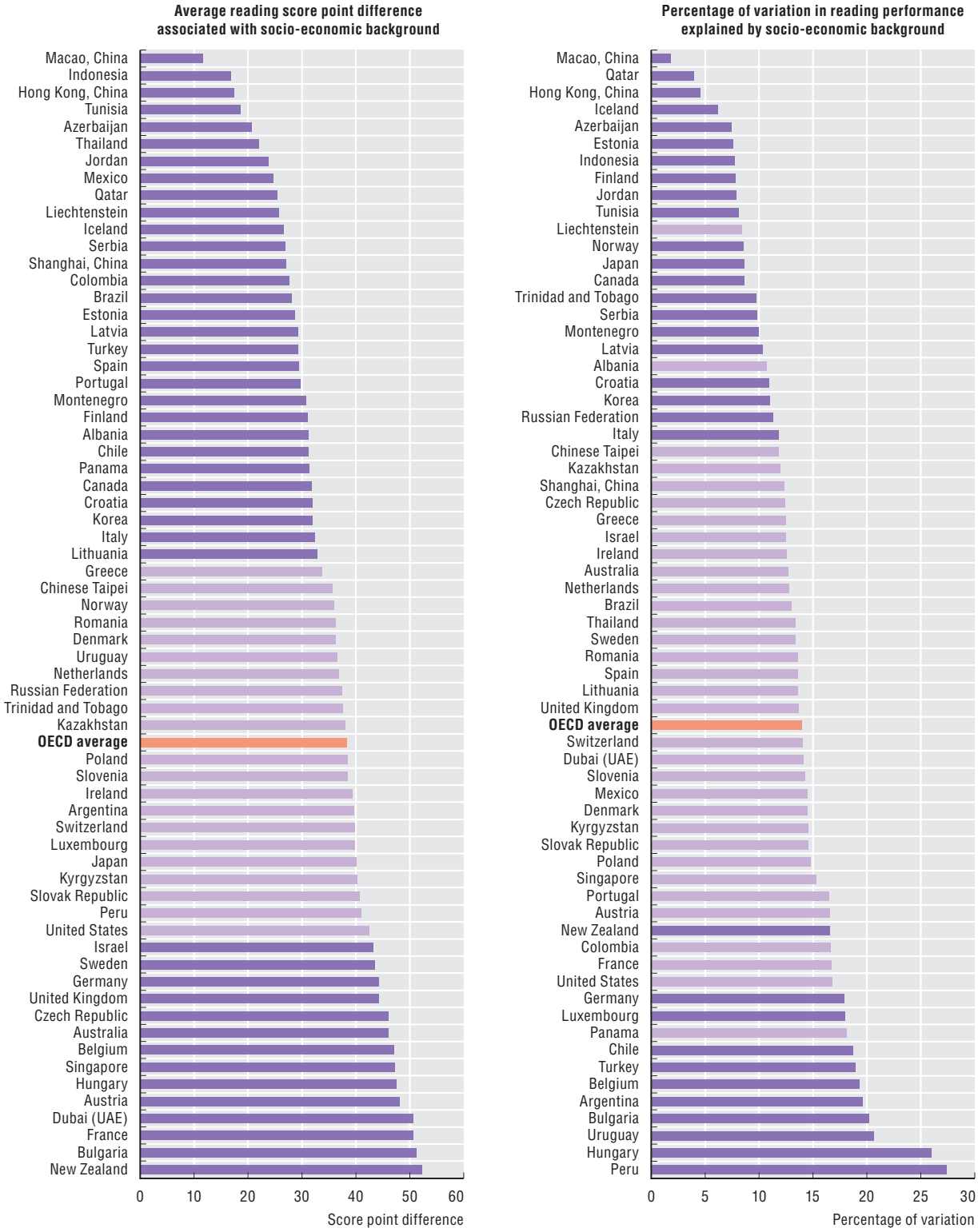
Socio-economic background is measured according to the *PISA index of social, cultural and economic status*, which is based on information, provided by students, about their parents' education and occupations and their home possessions, such as a desk to use for studying and the number of books in the home. On this index, one "unit" is equivalent to one standard deviation across all OECD students meaning that across all OECD countries, about two-thirds of students are from a socio-economic background that is between one unit above and one unit below the average.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 2 of *PISA 2009 Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*. Full data are shown in Table II.3.2 at the back of that volume.

Figure 2.1. **Socio-economic background and reading performance**



Note: Values that are statistically different from the OECD average are marked in dark violet.

Source: OECD (2010), *PISA 2009 Results, Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*, Figures II.3.3 and II.3.4, available at *http://dx.doi.org/10.1787/888932343589*.

Can disadvantaged students defy the odds against them?

- *Across OECD countries, nearly one-third of disadvantaged students are identified as "resilient", meaning that they perform better in reading than would be predicted from their socio-economic backgrounds.*
- *The majority of students from socio-economically disadvantaged backgrounds in Korea and the partner economies Hong Kong, China; Macao, China and Shanghai, China are considered resilient.*
- *Only 23% of boys, but 40% of girls, from disadvantaged backgrounds are considered resilient in reading.*

What it means

Despite a strong association between socio-economic background and reading performance, many students from disadvantaged backgrounds defy predictions and perform well. Thus educators should not assume that someone from a disadvantaged background is incapable of high achievement.

Findings

Students' observed performance in reading can be compared to what would be expected of them, given their socio-economic background. When a disadvantaged student's performance is ranked among the top quarter internationally, relative to expectation, he or she is classified as "resilient". By this measure, 31% of students from disadvantaged backgrounds in OECD countries are resilient.

In Korea and the partner economies Hong Kong, China; Macao, China and Shanghai, China; between one half and three-quarters of students from disadvantaged backgrounds are resilient. In these countries and economies, most students with modest backgrounds do far better in reading than would be expected. In contrast, in nine partner countries, fewer than one in ten disadvantaged students do so.

In all countries, girls from disadvantaged backgrounds are far more likely to show resilience in reading performance than boys. Across OECD countries 40% of girls, compared to 23% of boys, are considered resilient. The majority of disadvantaged girls in this category are found in Finland, Korea, Poland, Portugal and the partner country and economies Hong Kong, China; Macao, China; Shanghai, China and Singapore.

Definitions

Based on the performance of students from different backgrounds across countries, PISA predicts how well a student will perform. Each student's performance can be measured in terms of how much they exceed or fall below this prediction. The quarter of all students across countries who do best relative to those predictions can be seen as the group of students who most exceed expectations. A 15-year-old who is among the 25% most socio-economically disadvantaged students in his or her own country, and whose reading performance is ranked among the international group of students who most exceed expectations, is described as "resilient". Such a student combines the characteristics of having the weakest prospects and doing the best given those prospects.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

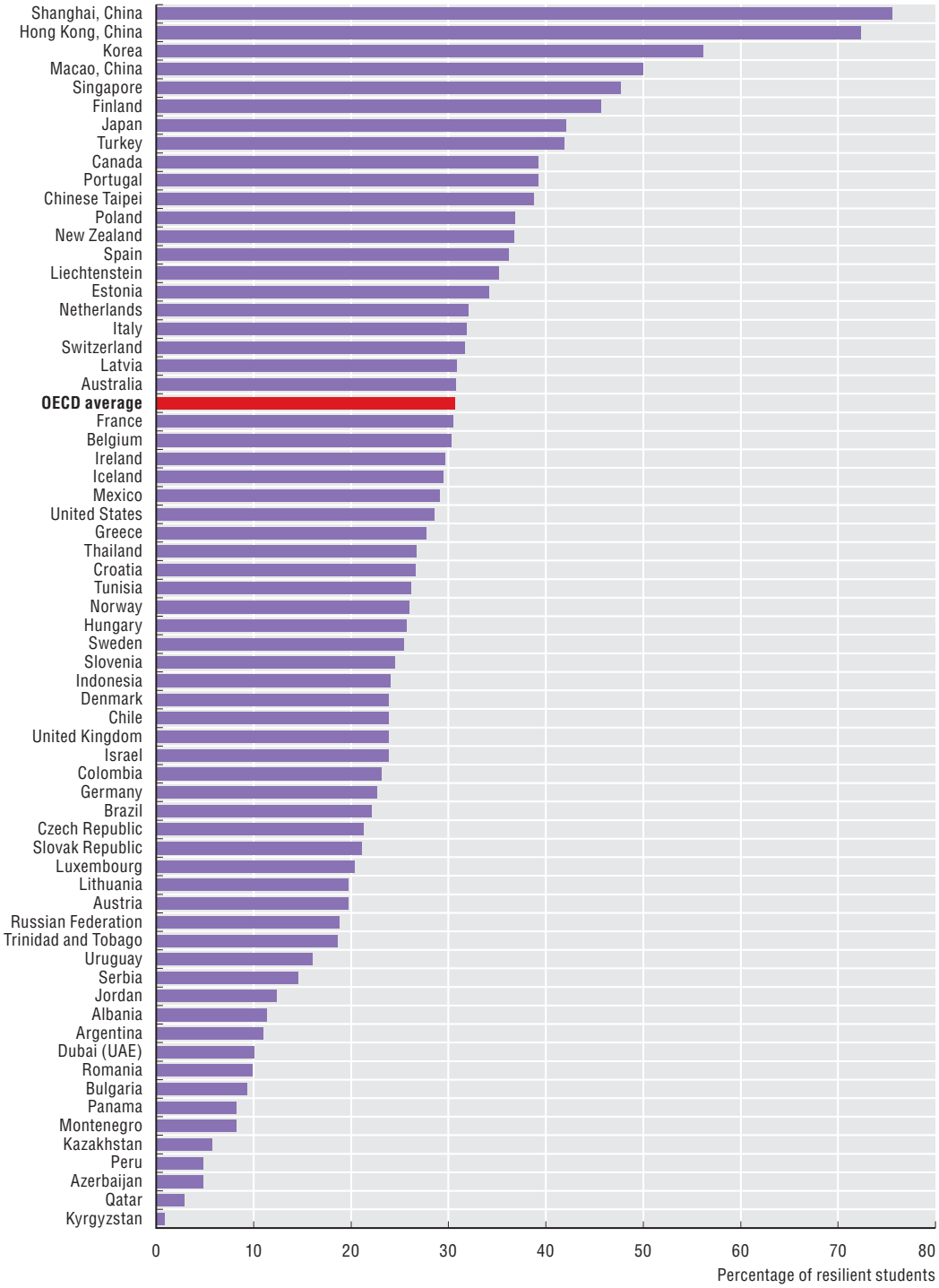
Going further

Further analysis is presented in Chapter 3 of *PISA 2009 Results Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*. Full data are shown in Table II.3.3 at the back of that volume.

Further reading from the OECD

Against the Odds: Disadvantaged Students Who Succeed in School (forthcoming)

Figure 2.2. **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* 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 percentage of resilient students among disadvantaged students (those in the bottom quarter of the PISA index of social, economic and cultural status).

Source: OECD (2010), *PISA 2009 Results, Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*, Figure II.3.6, available at *http://dx.doi.org/10.1787/888932343589*.

How do students from single-parent families perform in reading?

- *In most countries, children from single-parent families do not perform as well as students from two-parent or other types of families.*
- *In the United States and several partner countries, children from single-parent families score much lower in reading than their peers from two-parent or other types of families, even after accounting for socio-economic background.*
- *In nearly half of all participating countries, there is no difference in reading performance between students from single-parent families and those from other types of families, after accounting for socio-economic background.*

What it means

Across the OECD area, 17% of the students who participated in PISA 2009 are from single-parent families. In general, the parents of these students have lower educational qualifications and lower occupational status than parents on average across OECD countries. But PISA results show that theses disadvantages do not necessarily translate into lower performance among children from single-parent households. These findings prompt the question of whether public policy, including policies on welfare and childcare as well as on education, can help to make it easier for single parents to support their children's education.

Findings

On average across OECD countries, the performance gap between students from single-parent families and students from other types of families is 18 score points, before taking socio-economic background into account. However, after adjusting for student background, the gap is, on average, just five points.

In some countries, even after taking socio-economic background into account, children from single-parent households still face considerable challenges. Among OECD countries, the disadvantage is highest in the United States, where 15-year-olds from single-parent families score more than 40 points below their peers from other types of families in reading, and 23 score points below even after accounting for socio-economic background. Score point differences after accounting for socio-economic background range from 13 points in Ireland, Poland and Mexico, to 28 points in the partner country Trinidad and Tobago, 38 points in the partner country Jordan, and to as high as 61 points in the partner country Qatar. In all of these countries, at least one in ten students live in a single-parent family; in the United States and Trinidad and Tobago, nearly 25% of students do.

However, in half of the countries that participated in PISA 2009, there was no significant relationship between living in a single-parent family and reading performance, once socio-economic background had been taken into account. In the partner countries, Croatia, Estonia, Kazakhstan, Kyrgyzstan and Peru, students from single-parent families performed better-than-average in reading, after accounting for socio-economic background.

Definitions

This analysis measures the score point difference in reading performance between 15-year-olds who live with one parent compared to other 15-year-olds. In accounting for socio-economic background, it shows the average difference in reading performance between students from different types of families with similar backgrounds.

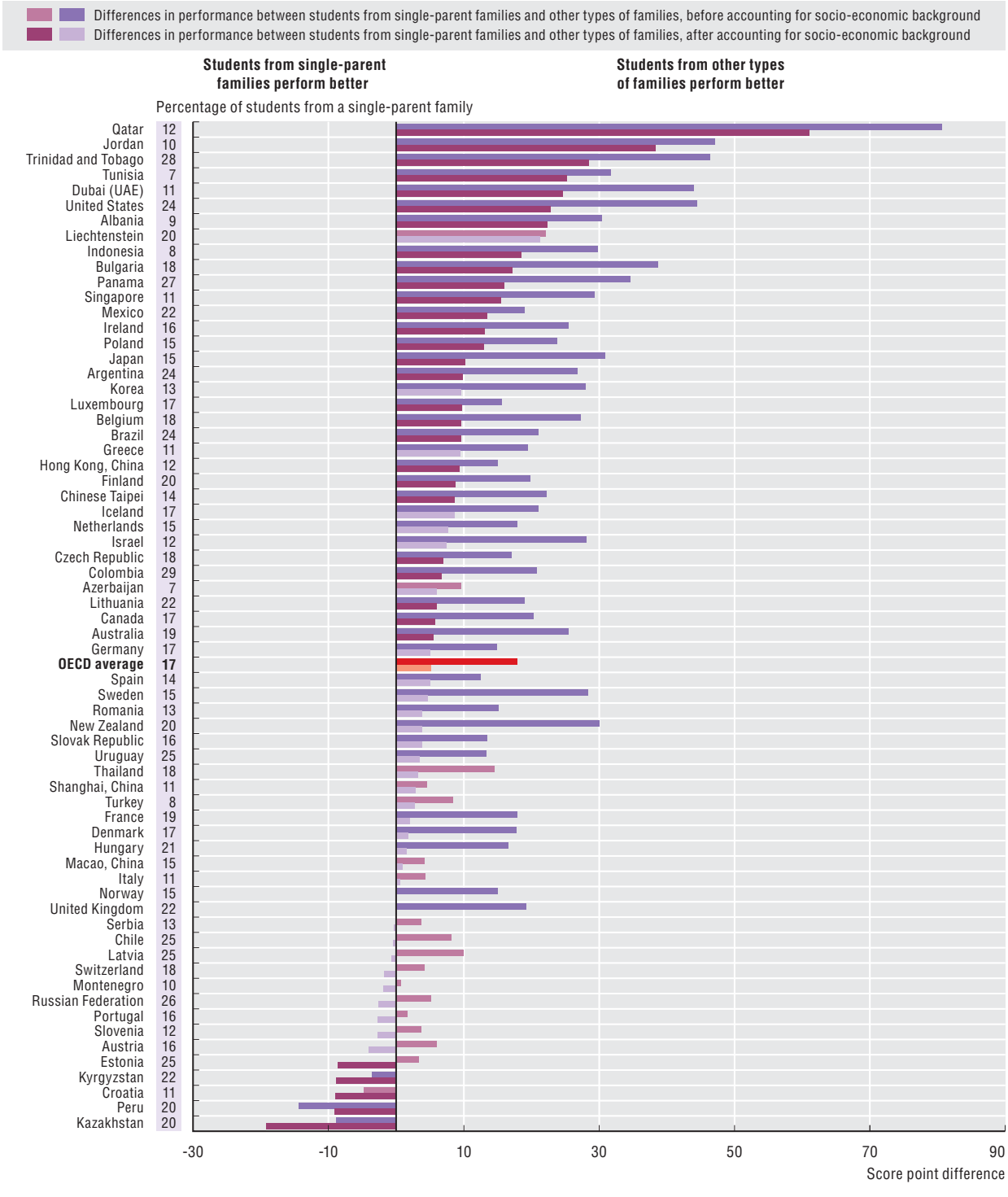
Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 2 of *PISA 2009 Results Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*. Full data are shown in Table II.2.5 at the back of that volume.

Figure 2.3. **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 (2010), *PISA 2009 Results, Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*, Figure II.2.5, available at *http://dx.doi.org/10.1787/888932343570*.

How do students with an immigrant background perform in reading?

- *Even after accounting for socio-economic background, students with an immigrant background score, on average, 27 points below students without an immigrant background. However, this varies greatly across countries.*
- *Students with an immigrant background who speak a language at home that is different from the one used in the PISA assessment scored, on average, 35 points lower than students without an immigrant background, after accounting for socio-economic background.*

What it means

Students with an immigrant background who speak a different language at home than the one in which the PISA assessment was conducted face considerable challenges in reading and other aspects of education. In general, they tend to show lower levels of performance even after their socio-economic background is taken into account. However, the gaps in performance vary greatly and, in some countries, students from an immigrant background perform just as well as their non-immigrant peers.

Findings

In most countries, students without an immigrant background outperform immigrant students whose home language is different from the one in which they were assessed. On average across OECD countries, students from an immigrant background scored 57 points below their non-immigrant peers in reading. While this gap shrunk to 35 score points after socio-economic background was taken into account, the difference still amounts to nearly half a proficiency level in reading.

In some countries, large gaps in performance remain, even after accounting for socio-economic background. In Spain, Belgium and Sweden, where students with an immigrant background constitute 9%, 15% and 12% of the student population, respectively, the differences between students with and without an immigrant background are all above 40 score points; in Italy, where 5% of students have an immigrant background, the difference is as high as 53 score points, even after accounting for socio-economic background. The diverse linguistic, cultural, economic and social backgrounds of immigrant students in different countries help explain why their performance varies considerably. However, given the PISA results, such variation in performance cannot simply be attributed to the students' individual characteristics or the fact that they are more socio-economically disadvantaged.

Definitions

This analysis defines students with an immigrant background as those who were born in the country of assessment but whose parents are foreign-born (second-generation) and those who are foreign-born whose parents are also foreign-born (first-generation). Students were asked if they speak the language of assessment at home to determine whether they are at a linguistic disadvantage.

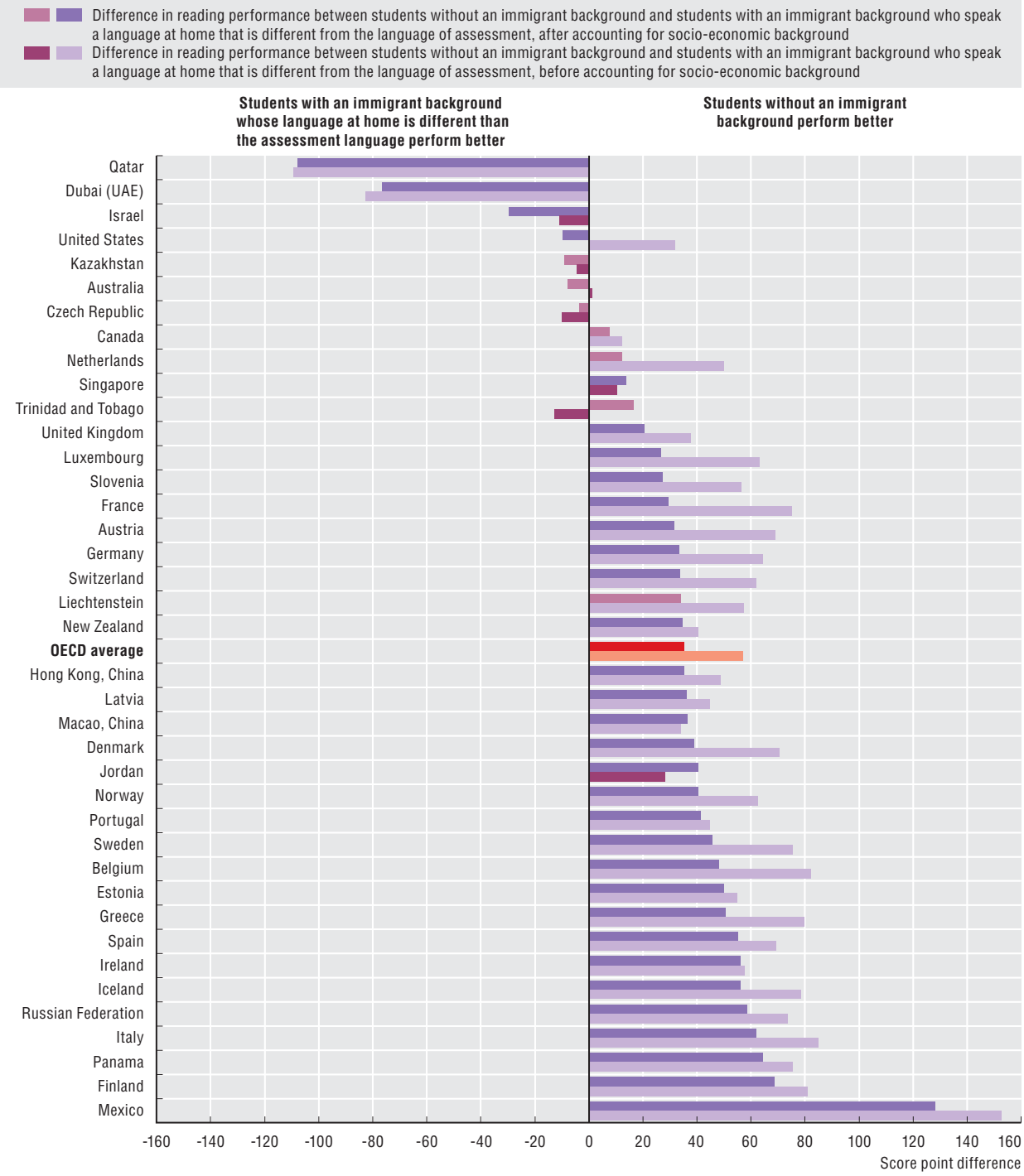
Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 4 of *PISA 2009 Results Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*. Full data are shown in Tables II.4.1 and II.4.4 at the back of that volume.

Figure 2.4. **Immigrant status, language spoken at home and reading performance**

Performance differences between students with an immigrant background whose language at home is different from the language of assessment and students without an immigrant background



Note: Score point differences that are statistically significant are marked in a darker tone. Countries are ranked in ascending order of score point differences between students without an immigrant background and students with an immigrant background who speak a language at home that is different from the language of a assessment, after accounting for the economic, social and cultural status of students.

Source: OECD (2010), *PISA 2009 Results, Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*, Figure II.4.10, available at *http://dx.doi.org/10.1787/888932343608*.

Does where a student lives affect his or her reading performance?

- *In most countries, students in cities perform better than those in rural areas, even after accounting for the higher average socio-economic status of city-dwellers.*
- *The performance differences between students who live in cities and those who live in rural areas are greatest in Hungary and Turkey. They are also very large in Chile, Mexico and the Slovak Republic, and in the partner countries Bulgaria, Kyrgyzstan, Panama and Peru, where students in cities are, on average, more than one proficiency level ahead of those in rural areas.*

What it means

In some countries, the size or location of the community in which a school is located is strongly related to student performance. In large communities or densely populated areas, more educational resources may be available for students. Isolated communities might need targeted support or specific educational policies to ensure that students attending schools in these areas reach their full potential.

Findings

Across OECD countries, students in urban schools perform an average of 23 score points higher in reading than students in other areas, even after accounting for socio-economic background. The difference is largest in Hungary and in the partner countries Bulgaria, Kyrgyzstan, Panama and Peru. In each of these countries, 15-year-olds in city schools are at least one proficiency level ahead of those in rural schools. The performance gap between students living in urban and rural areas is at least half a proficiency level in Chile, the Czech Republic, Italy, Mexico, Portugal, the Slovak Republic, Slovenia, Turkey and in the partner countries Albania, Argentina, Bulgaria, Indonesia, Jordan, Kyrgyzstan, Panama, Peru, Qatar, Romania and Tunisia.

School location and student performance, however, are not strongly related after accounting for socio-economic differences in Belgium, Finland, Germany, Greece, Iceland, Ireland, Israel, the Netherlands, Poland, Sweden, the United Kingdom and the United States and in the partner countries and economy Croatia, Dubai (UAE), Montenegro, the Russian Federation and Serbia.

The variation in performance reflects differences in the educational opportunities available in rural and urban areas, and the characteristics of these locations, such as population density, distribution of labour markets, and the extent to which urban and suburban areas are sought and populated by individuals from different backgrounds.

The PISA data can also be used to compare the performance of students in large cities across countries. In Canada, Japan and Korea, for example, students in cities with over one million people perform better than those in large cities in other OECD countries. In Poland, students in large cities perform at a similar absolute level to those in Canada, Japan and Korea; but when the different socio-economic composition of urban and rural areas is taken into account, students in large cities in Poland do not perform as well. This reflects the fact that students in Polish cities have much higher socio-economic status on average than those in the countryside.

Definitions

PISA categorises the communities in which the schools and students were assessed as *i)* villages, hamlets or rural areas with fewer than 3 000 people, *ii)* small towns with 3 000 to 15 000 people, *iii)* towns with 15 000 to 100 000 people, iv) cities with 100 000 to one million people and *v)* large cities with over a million people. The analysis above compares the performance of students in villages, hamlets or rural areas with that of students in cities with 100 000 or more people.

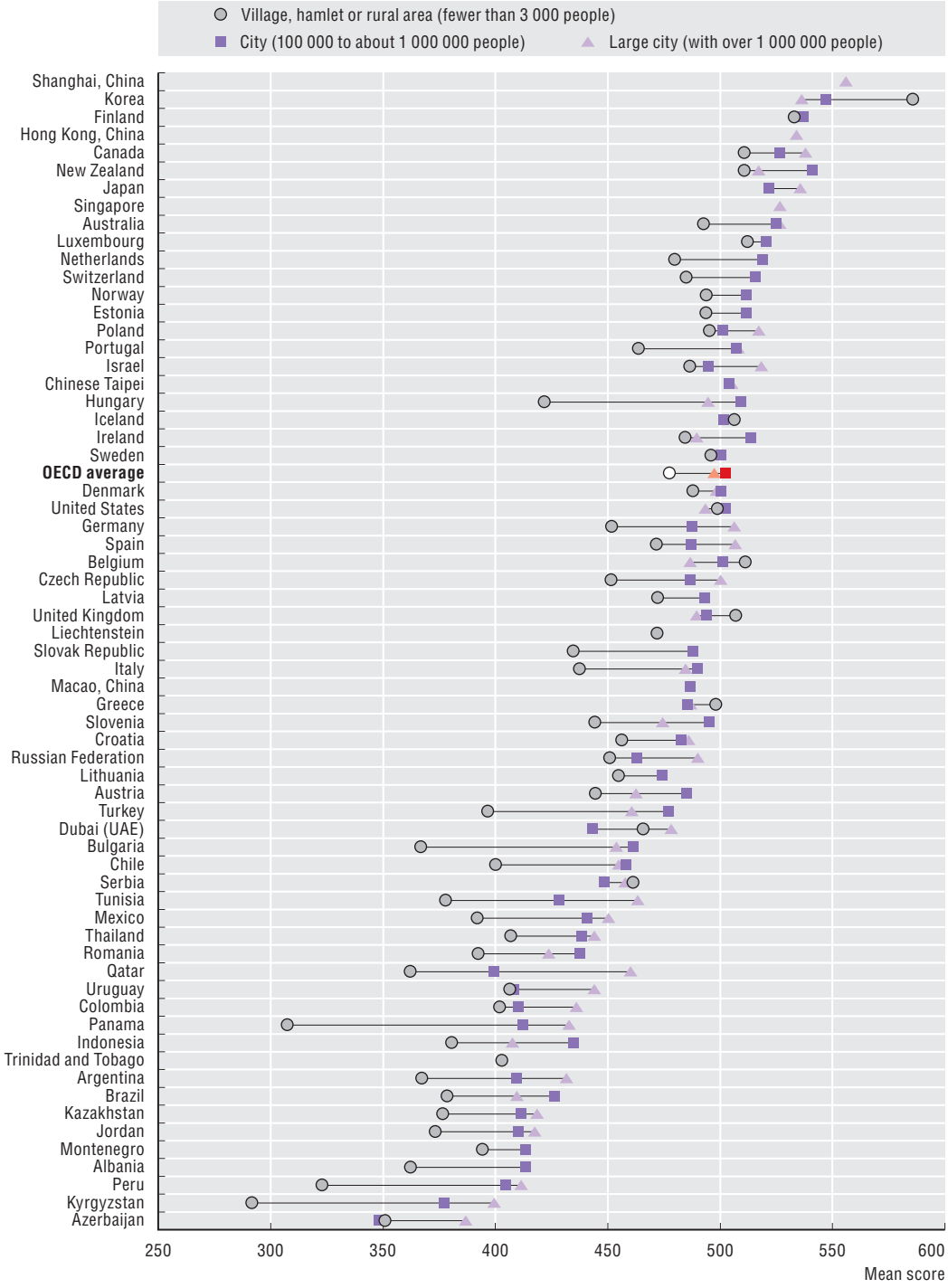
Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 2 of *PISA 2009 Results Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*. Full data are shown in Table II.2.6 at the back of that volume.

Figure 2.5. **Reading performance, by school location**

Mean scores after accounting for socio-economic background



Note: 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 were used, including village, hamlet and rural area (shown), and two other categories which are not shown in this Figure (small town [3 000 to about 15 000 people] and town [15 000 to about 100 000 people]).

Source: OECD (2010), *PISA 2009 Results, Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*, Figure II.2.6, available at *http://dx.doi.org/10.1787/888932343570*.

How equitably are school resources distributed?

– *In half of all OECD countries, students from more socio-economically disadvantaged backgrounds tend to benefit from lower student-teacher ratios. However, in most countries, schools with more socio-economically advantaged students tend to have more full-time teachers with university degrees.*

– *In Israel, Slovenia, Turkey and the United States, more advantaged students generally attend schools with favourable student-teacher ratios.*

What it means

A major challenge in many countries is to ensure that resources for education are equitably distributed. This can mean devoting more resources to schools attended by students from less advantaged backgrounds. However, in some cases, it is the more advantaged schools that end up with superior human and material resources, both in quality and quantity.

Findings

In around half of OECD countries, socio-economically disadvantaged schools have lower student-teacher ratios, suggesting that these countries try to help the students in such schools by providing more teachers. This relationship is particularly pronounced in Belgium, Denmark, Estonia, Germany, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, Portugal and Spain. However, in Israel, Slovenia, Turkey and the United States, and in the partner countries and economies Dubai (UAE); Brazil; Indonesia; Singapore and Shanghai, China the reverse is true: more socio-economically advantaged schools enjoy better student-teacher ratios.

When it comes to the quality of teachers, on the other hand, the picture is considerably different. In most countries, schools whose students are mostly from socio-economically advantaged backgrounds have more full-time teachers with university degrees. This advantage is highest in Austria, Belgium, the Netherlands, Slovenia and the partner countries Azerbaijan, Liechtenstein, Peru and Trinidad and Tobago. Only in the Slovak Republic, the partner economies Dubai (UAE) and Macao, China and the partner country Qatar do schools with a large population of less-advantaged students tend to have more highly qualified teachers. These results suggest that while socio-economically disadvantaged schools are often relatively well provided for in terms of the quantity of teaching resources, this is not true for the quality of these resources.

Definitions

A positive relationship between the socio-economic background of students and schools and resources for education implies that more advantaged schools also 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 socio-economically advantaged and disadvantaged schools.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 2 of *PISA 2009 Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*. Full data are shown in Table II.2.2 at the back of that volume.

Table 2.1. **Relationship between schools' average socio-economic background and school resources**

	Simple correlation between the school mean socio-economic background and:			Simple correlation between the school mean socio-economic background and:	
	Percentage of teachers with university-level degree (ISCED 5A) among all full-time teachers	Student/teacher ratio		Percentage of teachers with university-level degree (ISCED 5A) among all full-time teachers	Student/teacher ratio
Australia			**OECD average**	+	+
Austria	++		Partners		
Belgium	++	++	Albania	++	+
Canada			Argentina		
Chile	+		Azerbaijan	++	+
Czech Republic	++		Brazil		–
Denmark	+	+	Bulgaria	+	+
Estonia		++	Colombia		
Finland			Croatia	+	++
France	w	w	Dubai (UAE)	–	–
Germany		+	Hong Kong, China	+	
Greece	+	+	Indonesia	+	–
Hungary			Jordan		
Iceland	++	++	Kazakhstan	++	++
Ireland		++	Kyrgyzstan	++	+
Israel	+	–	Latvia	+	++
Italy	+	++	Liechtenstein	++	++
Japan	+	++	Lithuania	+	+
Korea		++	Macao, China	–	+
Luxembourg	++	+	Montenegro	++	++
Mexico			Panama		
Netherlands	++	++	Peru	++	
New Zealand			Qatar	–	+
Norway	+	+	Romania		
Poland			Russian Federation	++	+
Portugal		++	Serbia		+
Slovak Republic	–		Shanghai, China	++	–
Slovenia	++	–	Singapore	+	–
Spain	m	++	Chinese Taipei	+	
Sweden		+	Thailand	+	
Switzerland	+		Trinidad and Tobago	++	++
Turkey		–	Tunisia	+	
United Kingdom			Uruguay		
United States		–			

Disadvantaged schools are more likely to have more or better resources

Advantaged schools are more likely to have more or better resources

Correlation is: ++ greater than 0.3
+ between 0.3 and 0.0
– between –0.03 and 0.0
– – less than –0.3

Note: Correlation indicates the strength of the relationship between the school mean socio-economic background and quality of resources.

Source: OECD (2010), *PISA 2009 Results, Volume II, Overcoming Social Background: Equity in Learning Opportunities and Outcomes*, Figure II.2.3, available at *http://dx.doi.org/10.1787/888932343570*.

Socio-economic background and reading performance

– *The performance gap between students from different socio-economic backgrounds narrowed in nine countries between 2000 and 2009, most markedly in the Czech Republic and the partner countries Albania and Latvia.*

– *The gap widened in five countries, most markedly in Korea, Sweden and the partner country Romania.*

– *In the other 22 countries with comparable results in both PISA 2000 and 2009, the relationship between socio-economic background and reading performance was unchanged.*

What it means

A major priority of education systems is to offer equitable learning opportunities, and ultimately realise equitable learning outcomes, regardless of students' socio-economic backgrounds. Nine years may be considered a relatively short time in which to weaken the relationship between student background and reading performance, yet PISA results show that some countries have succeeded in doing just that.

Findings

In nine countries, the predicted difference in reading scores between students from different social backgrounds narrowed between 2000 and 2009. In these countries, students' socio-economic background had less of an impact on their reading performance in 2009. For example, in 2000, the Czech Republic showed the largest gap in reading performance among students from different backgrounds, but by 2009 this gap had narrowed to a greater extent than in any other country. In Germany and the United States, two other countries with wide disparities in students' socio-economic backgrounds, these gaps also narrowed over the period. But the performance gaps in all three countries remain larger than or close to the OECD average.

In Canada, Chile and the partner countries Albania and Latvia, the impact of social background was closer to average in 2000, but also weakened over the period. In Mexico and the partner economy Hong Kong, China; the relationship between socio-economic background and reading performance was already relatively weak in 2000 and had weakened further by 2009. As a result, Hong Kong, China, which scored among the top five countries and economies in reading in 2009, now has one of the narrowest gaps in reading performance between students from advantaged and disadvantaged backgrounds. Even the most disadvantaged quarter of students in Hong Kong, China have reading scores above the OECD average.

In contrast, the performance gap between these groups of students widened in five countries during the same period. In Finland, Iceland and Korea, three of the countries with the narrowest performance gaps between students from different backgrounds in 2000, these gaps had widened significantly by 2009 but remain well below average. The partner country Romania no longer shows relatively small social differences in reading performance between advantaged and disadvantaged students as it did in 2000; it is now close to the OECD average. And in Sweden, the gap widened from close to average to above average.

Definitions

Socio-economic background is measured on an international index of social, cultural and economic status, using students' reports of their parents' education and occupations and their home possessions, such as whether they have a desk for doing school work and how many books they have in the house. On this index, one "unit" is equivalent to one standard deviation across OECD countries meaning that, in these countries, about two-thirds of students come from backgrounds that are between one unit above and one unit below average.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in the relationship between reading performance and socio-economic background between 2000 and 2009 is presented in Chapter 4 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.4.3 at the back of that volume.

Figure 2.6. **Relationship between students' socio-economic background and their reading performance in 2000 and 2009**

	2009 higher than 2000	2009 lower than 2000	No statistically significant difference
95% confidence level	+	–	o

Note: Countries are ranked in descending order of the overall association of the socio-economic background in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.4.4, available at *http://dx.doi.org/10.1787/888932360005*.

Relative performance of students from immigrant backgrounds

- *Overall in OECD countries, the relative performance of students with immigrant backgrounds did not change between 2000 and 2009.*
- *The performance gap between students with an immigrant background and those without was widest in Belgium, Germany and Switzerland in 2000, but the gap had narrowed greatly by 2009.*
- *In Ireland and Italy, a substantial increase in the number of immigrant students over the period was accompanied by a sharp deterioration in both their absolute and relative performance in reading.*

What it means

The immigrant population of many OECD countries is growing. In countries with comparable data, the proportion of 15-year-olds with an immigrant background increased by two percentage points, on average, between 2000 and 2009, although in some countries the proportion decreased. Learning outcomes among students from an immigrant background are thus the subject of some scrutiny among education policy makers, particularly in countries where these students show significantly poorer performance in school than their peers who do not come from immigrant backgrounds.

Findings

On average in OECD countries, the performance gap between students with and without an immigrant background remained broadly similar over the period. Students without an immigrant background now outperform others by an average of 43 score points instead of the 44 score points recorded in 2000.

However, this relatively stable average masks substantial changes in a number of countries. In some countries where immigrant students had reading scores well below those of native students in 2000, the gap has narrowed considerably. For example, the performance gap between students with immigrant backgrounds and those without was greatest in Belgium and Switzerland in 2000: the equivalent of well over one proficiency level. These gaps were narrowed by over half a proficiency level by 2009, although in both cases, they are still wider than the OECD average. Germany shows a similar trend, while in the partner country Liechtenstein the gap has more than halved.

In New Zealand, the performance gap between these two groups of students, already relatively narrow in 2000, shrunk further by 2009. In Australia, students with and without immigrant backgrounds had similar reading scores in 2000; nine years later, students with immigrant backgrounds performed better in reading than their native peers. This is partly explained by the relatively high socio-economic status of many immigrants in Australia, whose children now make up nearly a quarter of the country's population of 15-year-olds.

In Italy and Ireland, the performance gap between students with and without an immigrant background widened. In Ireland, students with an immigrant background performed considerably better, on average, than native-born students in 2000, but in 2009, they performed considerably worse. This relates to a dramatic increase in the immigrant population in Ireland, which led to an increase in the proportion of students with immigrant backgrounds from 2% to 8% over the nine years. While there was a general decline in reading performance in Ireland during the period, reading scores among students with an immigrant background fell even further.

Italy, too, saw a rise in the proportion of students with an immigrant background from just 1% in 2000 to nearly 6% nine years later. Here, the performance of students without an immigrant background did not change significantly during the period, but the performance of students with an immigrant background was lower in 2009. They are now one full proficiency level behind native students, instead of half a proficiency level lower as they were in 2000.

Definitions

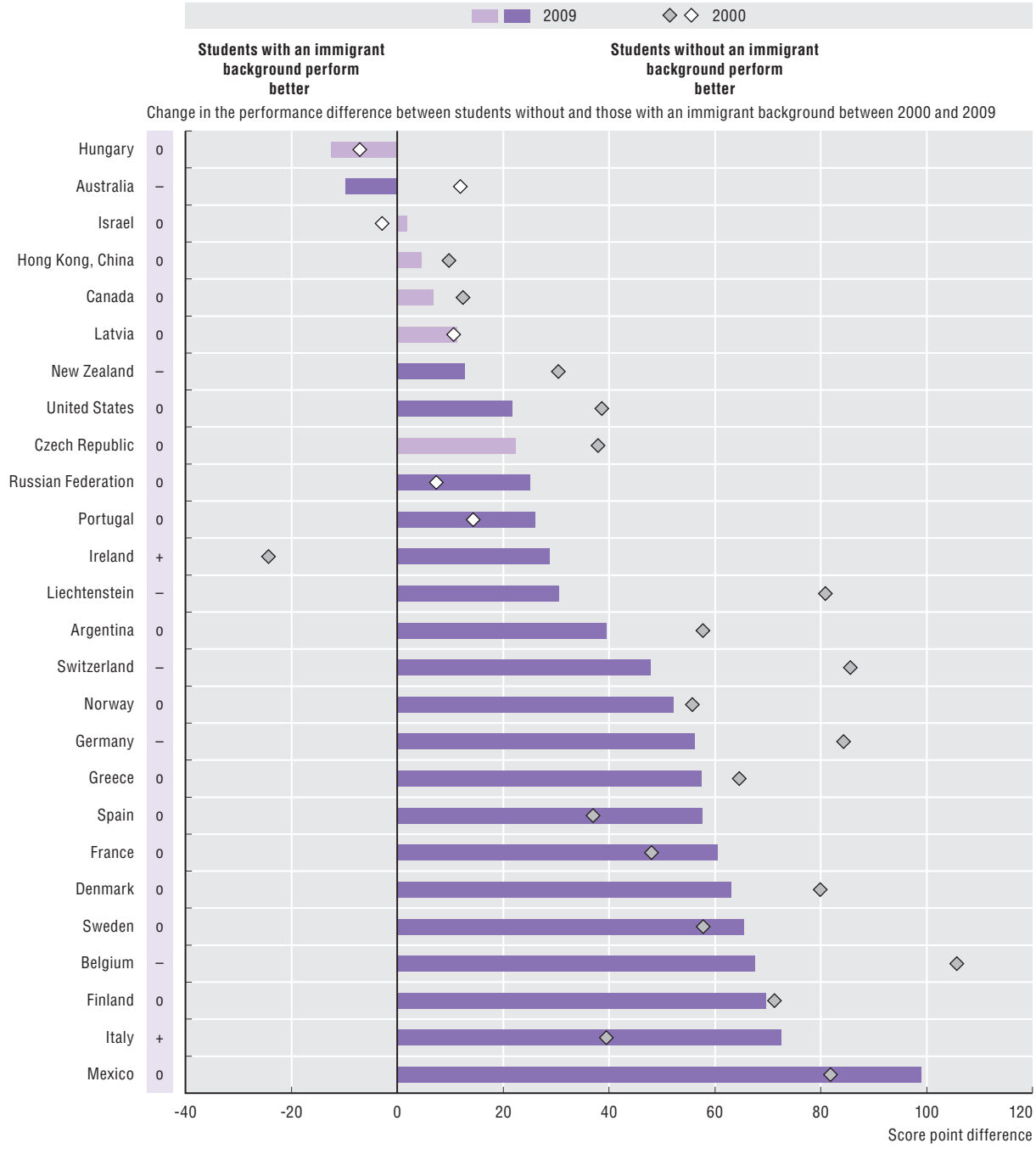
The term "immigrant students" refers to students with an immigrant background: they were either born outside the country in which the assessment was conducted or have parents who were. Native students are those who were born in the country, as were their parents.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in the relationship between immigrant status and student performance between 2000 and 2009 is presented in Chapter 4 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.4.4 at the back of that volume.

Figure 2.7. **Immigrant background and reading performance in 2000 and 2009**



	2009 higher than 2000	2009 lower than 2000	No statistically significant difference
95% confidence level	+	–	o

Note: Statistically significant score point differences are marked in a darker tone. Countries are ranked in ascending order of the performance difference between students without and those with an immigrant background in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.4.7, available at *http://dx.doi.org/10.1787/888932360005*.

3. LEARNING TO LEARN

Are students who enjoy reading better readers?

What kinds of reading are associated with being a good reader?

Do boys and girls have different reading habits?

What learning strategies help students perform better?

Trends

Reading for enjoyment

Reading for enjoyment, by gender and background

Are students who enjoy reading better readers?

- *Across OECD countries, the quarter of students who enjoy reading most score one-and-a-half proficiency levels higher in reading than the quarter who enjoy reading the least.*
- *Variations in reading enjoyment explain 18% of differences in reading performance.*
- *The link between reading performance and enjoyment of reading tends to be strongest in countries where students do best in reading overall.*

What it means

Students who enjoy reading, and therefore make it a regular part of their lives, are able to build their reading skills through practice. PISA shows strong associations between reading enjoyment and performance. This does not mean that results show that enjoyment of reading has a direct impact on reading scores; rather, the finding is consistent with research showing that such enjoyment is an important precondition for becoming an effective reader. Therefore, to bolster reading performance, schools can both instruct students in reading techniques and foster an interest in reading.

Findings

In almost all countries, students who enjoy reading are significantly more likely to be good readers. Across OECD countries, this difference accounts for an average of 18% of the variation in reading performance. This means that one could predict nearly one-fifth of the differences in student reading scores based on how much students enjoy reading.

PISA results show that the group of countries where enjoyment of reading makes the least difference in reading performance tends to have lower reading scores, overall, than those countries where enjoyment of reading makes more of a difference.

In Australia and Finland, two of the best-performing countries overall, over 25% of differences in reading performance are associated with how much students enjoy reading. In these countries and in New Zealand, the quarter of students who enjoy reading the most reach exceptionally high reading levels, around the middle of Level 4.

Of the 17 countries where at least 20% of the variation in reading performance is explained by enjoyment of reading, 16 are OECD countries. On average in OECD countries, there is a difference of 103 points between the average scores of the top and bottom quarter of students ranked by reading enjoyment. The quarter of students who score the lowest are generally only able to perform relatively simple reading tasks at the baseline proficiency Level 2. The quarter of students who show the highest levels of reading enjoyment attain at least proficiency Level 4, meaning that they have a 50% chance of completing a relatively complex reading task.

Definitions

Reading enjoyment is measured on an index based on student responses to a questionnaire. PISA asked them how strongly they agreed with statements about their attitudes towards reading, such as "I only read if I have to", "I enjoy going to a bookstore or a library" and "I cannot sit still and read for more than a few minutes".

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

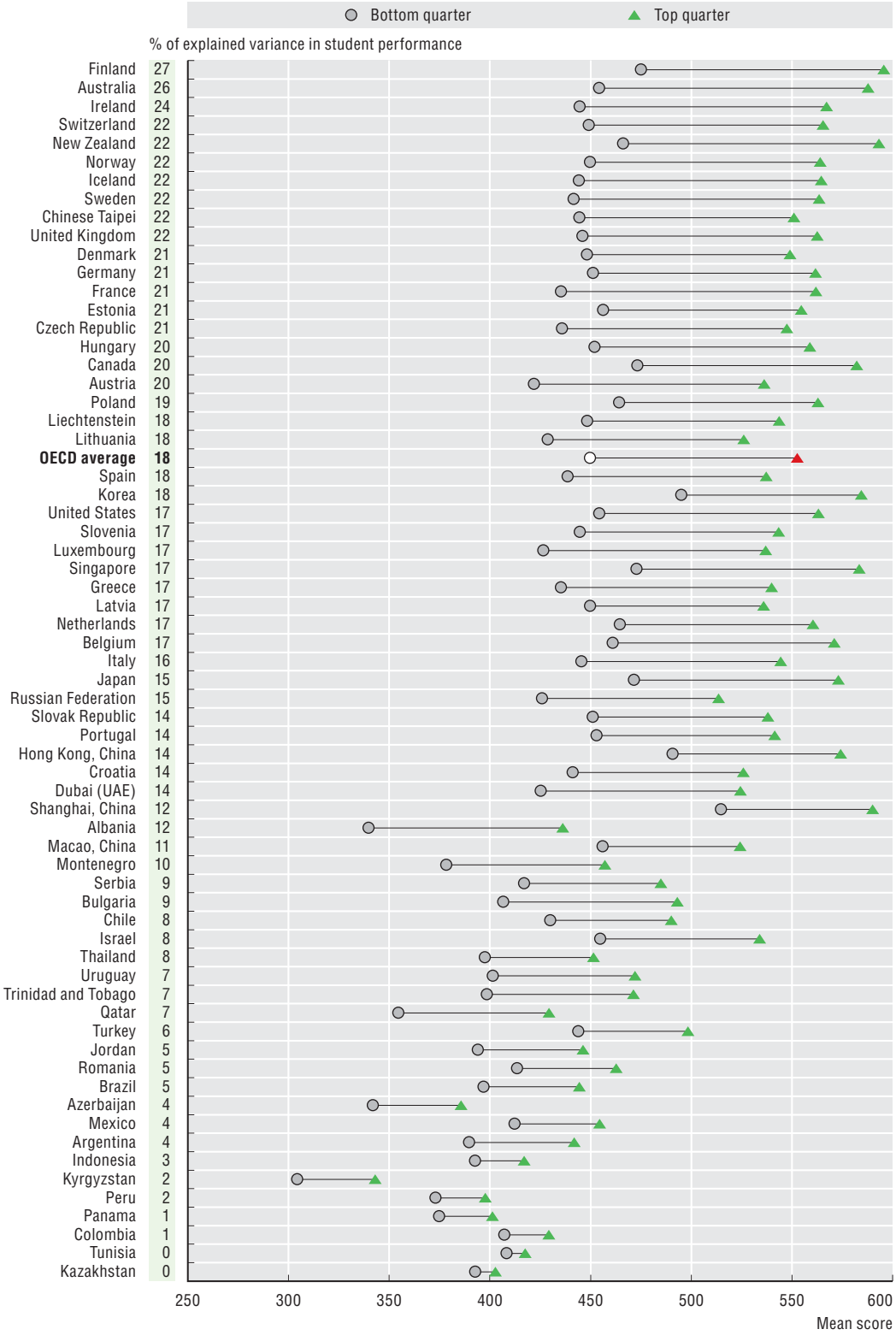
Going further

Further analysis is presented in Chapters 1 and 2 of *PISA 2009 Results Volume III, Learning to Learn: Student Engagement, Strategies and Practices*. Full data are shown in Table III.1.1 at the back of that volume.

Further reading from the OECD

Learners for Life: Student Approaches to Learning (2003).

Figure 3.1. **The relationship between enjoying reading and performance in reading**



Note: Countries are ranked in descending order of percentage of explained variance in student performance.

Source: OECD (2010), *PISA 2009 Results, Volume III, Learning to Learn: Student Engagement, Strategies and Practices*, Figure III.1.3, available at *http://dx.doi.org/10.1787/888932360176*.

What kinds of reading are associated with being a good reader?

– *In most countries, students who read fiction for enjoyment are much more likely to be good readers.*

– *Students who read newspapers, magazines and non-fiction are also better readers in many countries, although the effect on reading performance is not as pronounced.*

– *Students are much more likely to read newspapers and magazines frequently than other types of reading material.*

What it means

Students who read widely for pleasure have a better chance to build and enhance their reading skills. While the strongest readers are those who read fiction, in practice many students show a preference for other forms of reading that have more direct relevance to their daily lives. Encouraging the reading of diverse materials, such as magazines, newspapers and non-fiction, can help to make reading a habit, especially for some weaker readers who might not be inclined to read a work of fiction.

Findings

In most countries, students who read fiction are particularly likely to be good readers. On average across OECD countries, students who read fiction for their own enjoyment at least several times a month score 53 points above those who do so less frequently. This is equivalent to three-quarters of a proficiency level.

However, the link between reading fiction and strong reading performance varies greatly across countries. In Mexico, Turkey and seven other countries, this link is not apparent; but in the OECD countries Australia, Austria, Finland, Luxembourg and Sweden, there is a gap of at least one proficiency level between the scores of those 15-year-olds who read fiction frequently and those students who read fiction less often. Students who read magazines and newspapers regularly for enjoyment also tend to be better readers than those who do not. However, the relationship is less strong than that between performance and reading fiction. Only in Iceland, Israel, Sweden and the partner countries Kyrgyzstan and Peru do regular readers of newspapers score at least 35 points more, on average, than other students. Students who read magazines regularly score at least 35 points above those who do not in Finland, Hungary, the Netherlands, the Slovak Republic and in the partner countries Bulgaria and Montenegro.

Frequent readers of non-fiction read at a higher level than average in some countries, but in most countries, there is no significant positive relationship with performance. The difference is greater than 35 score points in the Netherlands, Poland, Slovenia, Spain, Sweden and the partner countries Bulgaria, Croatia and Lithuania.

Reading comic books is generally associated with a low level of reading performance. This could well be because weaker readers find comic books more accessible.

These findings need to be set alongside the actual frequency with which students read different materials for enjoyment. On average in OECD countries:

- 62% of students read newspapers at least several times a month;
- 58% read magazines;
- 31% read fiction;
- 22% read comic books; and
- 19% read non-fiction.

Definitions

Students were asked how often they read various types of material because they want to. The graph opposite compares those who said they read fiction and comic books "several times a week" or "several times a month" to those who said they read these materials less frequently or do not read them for enjoyment at all. The results take into account students' gender, socio-economic background and immigrant status.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

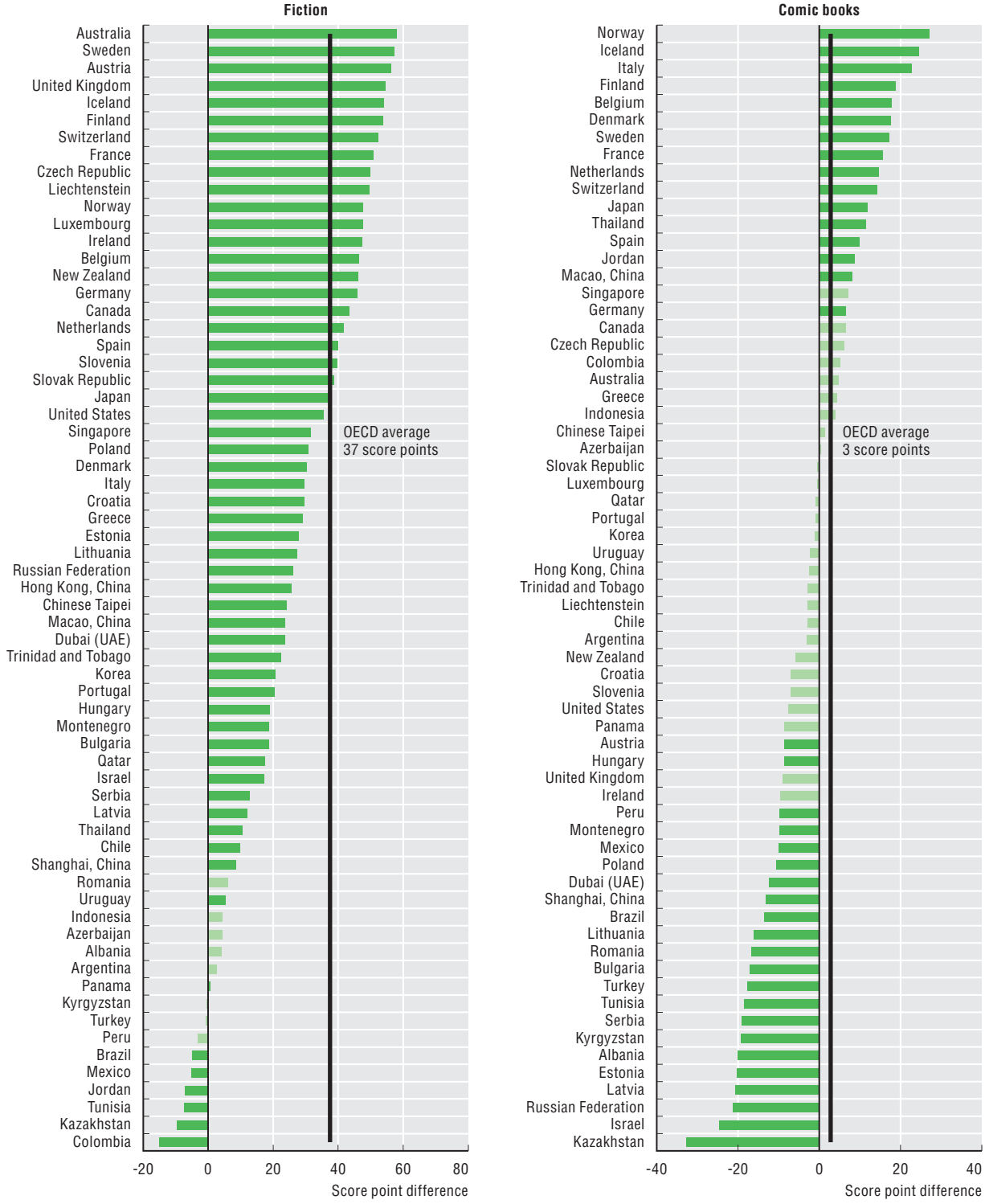
Going further

Further analysis is presented in Chapters 1 and 2 of *PISA 2009 Results Volume III, Learning to Learn: Student Engagement, Strategies and Practices*. Full data are shown on Tables III.1.2, III.1.6 and III.2.9 at the back of that volume.

Further reading from the OECD

Learners for Life: Student Approaches to Learning (2003).

Figure 3.2. **Relationship between the types of materials students read and performance in reading**



Note: Score point differences that are statistically significant are marked in a darker tone. Score point difference associated with reading several times a month or several times a week compared to a student who does not read for enjoyment, accounting for gender, socio-economic background and whether the student has an immigrant background.

Source: OECD (2010), *PISA 2009 Results, Volume III, Learning to Learn: Student Engagement, Strategies and Practices*, Figure III.1.6, available at *http://dx.doi.org/10.1787/888932360176*.

Do boys and girls have different reading habits?

- *In almost every country, girls read for enjoyment more than boys.*
- *On average, only about half of boys read for enjoyment; in Austria, Luxembourg, the Netherlands and the partner country Liechtenstein, less than 40% do so.*
- *Girls read fiction and magazines more than boys, but boys are more likely to read newspapers and comic books.*

What it means

The fact that girls outperform boys in reading is associated with girls' greater enjoyment of reading. Policy makers in countries where this gap is particularly pronounced should consider including measures to improve students' engagement in reading in any strategy to raise reading proficiency levels. With PISA results showing that boys have different reading habits than girls, policy makers should take into account boys' preference for reading different types of material when trying to raise their interest in and enjoyment of reading.

Findings

In every country except Korea, girls reported reading for enjoyment more than boys. On average across OECD countries, just over half of boys (52%) but nearly three-quarters of girls (73%) said that they read for enjoyment.

The gender gap in the proportion of girls and boys who read for enjoyment is greatest in Estonia, the Netherlands and in the partner countries Latvia and Lithuania, where it is at least 30 percentage points.

In 14 countries, only a minority of boys said that they read for enjoyment. In Austria, Luxembourg, the Netherlands and the partner country Liechtenstein, fewer than 40% said that they read for enjoyment.

In some of the countries that show small gender differences in enjoyment of reading, both boys and girls are relatively unlikely to report that they enjoy reading. In Japan, for example, only 54% of boys and 58% of girls reported that they enjoy reading. In some countries, the narrow gender gap reflects the opposite: both boys and girls enjoy reading to nearly the same extent. For example, in the partner countries and economy Albania; Indonesia; Kazakhstan; Kyrgyzstan; Shanghai, China and Thailand, at least 80% of boys and 90% of girls said that they read for enjoyment.

Other data from PISA show that girls and boys typically enjoy different kinds of reading. Girls are twice as likely to read fiction for enjoyment, and are more likely than boys to read magazines; boys more commonly read newspapers and comic books. This pattern applies across virtually every country in the case of girls' greater enjoyment of fiction and magazines, and across the great majority of countries in the case of boys preferring comic books and newspapers.

The fact that two in three boys, on average in OECD countries, reported that they read newspapers for pleasure, compared to only one in five who said they read fiction for enjoyment, shows that there could be far more potential for strengthening boys' reading skills by encouraging other types of reading in addition to literature.

Definitions

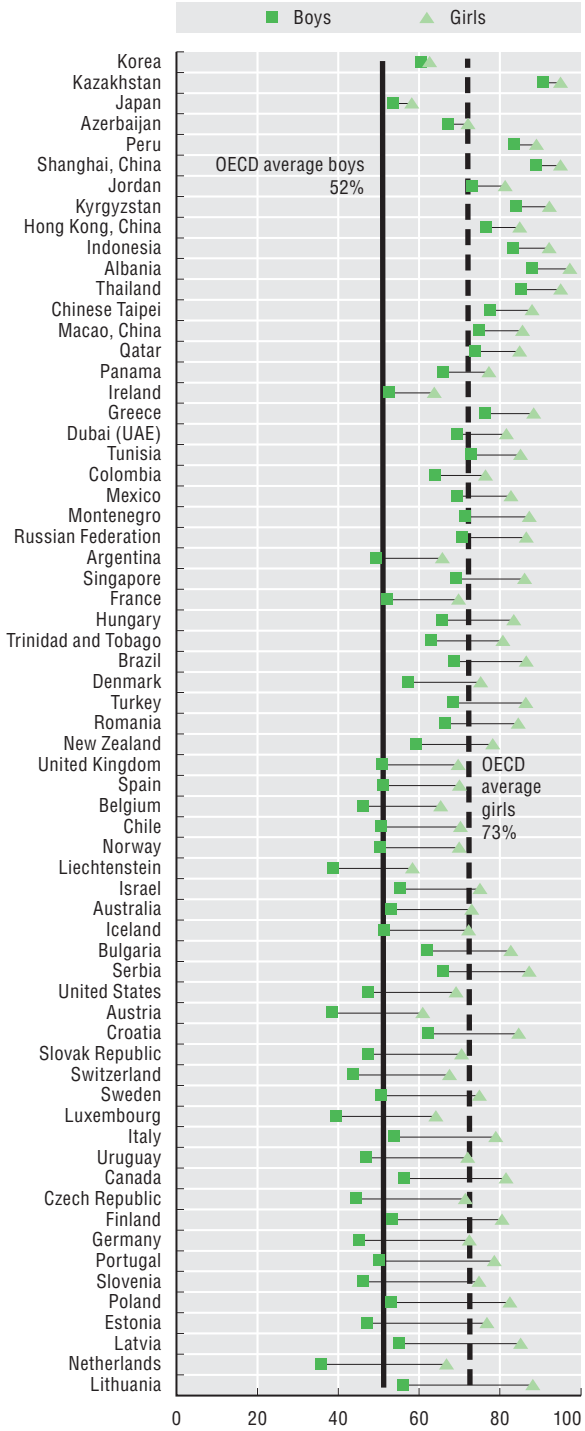
Students who participated in PISA were asked how much time they spend each day reading because they want to. The questionnaire also asked how often they read different types of materials because they want to. The results show the percentage of those 15-year-olds who read these kinds of materials at least "several times a month" or "several times a week".

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 2 of *PISA 2009 Results Volume III, Learning to Learn: Student Engagement, Strategies and Practices*. Full data are shown in Tables III.2.2 and III.2.10 at the back of that volume.

Figure 3.3. **Percentage of boys and girls who read for enjoyment**

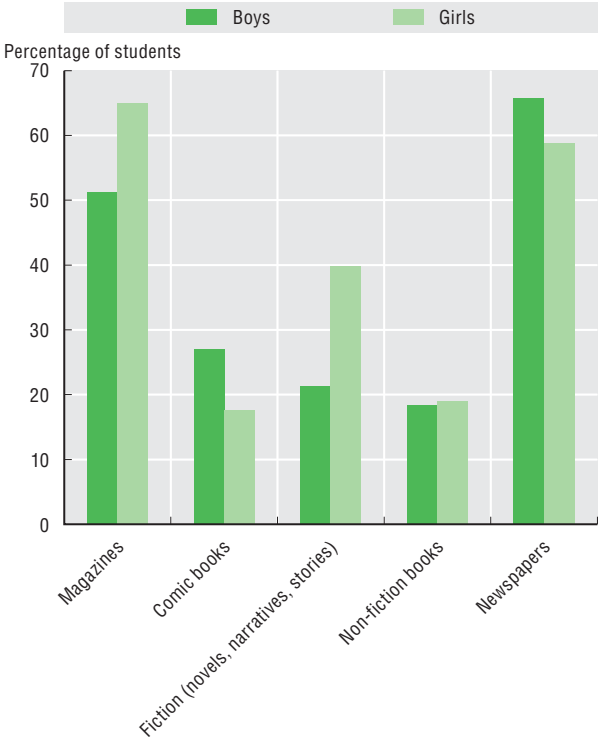


Note: Countries are ranked in ascending order of the difference of boys and girls who read for enjoyment.

Source: OECD (2010), *PISA 2009 Results, Volume III, Learning to Learn: Student Engagement, Strategies and Practices*, Figure III.2.4, available at *http://dx.doi.org/10.1787/888932360195*.

Figure 3.4. **What boys and girls read for enjoyment, OECD average**

Percentage of boys and girls who reported that they read the following materials because they want to "several times a month" or "several times a week"



Source: OECD (2010), *PISA 2009 Results, Volume III, Learning to Learn: Student Engagement, Strategies and Practices*, Figure III.2.14, available at *http://dx.doi.org/10.1787/888932360195*.

What learning strategies help students perform better?

– *Students who know how best to summarise information that they read can perform much harder reading tasks, on average, than those who do not.*

– *Students also perform better when they know which strategies help them to understand and remember information, and by adopting strategies to guide their own learning.*

– *Having a deep understanding of reading strategies, and using those strategies, are even stronger predictors of reading performance than whether students read widely for pleasure.*

What it means

PISA measures the extent to which students adopt certain strategies for reading and learning, and how aware they are of which strategies work best. The results support research showing that by consciously adopting effective learning strategies, students will learn more effectively than if they just follow teachers' instructions. This underlines the importance for parents, teachers and schools to provide students with the tools to become effective readers and learners.

Findings

PISA results show that students perform better in reading, on average, if they understand and use certain strategies for learning. In the order of the strength of this link, reading performance tends to be higher among:

- Students who know what strategies to adopt to summarise what they read. On average across OECD countries, the quarter of students who could most accurately identify which of these strategies work best scored 107 points (one-and-a-half proficiency levels) higher than the quarter with the least awareness of effective strategies.
- Students who know what strategies to adopt to understand and remember information. In this case, the performance gap between the top and bottom quarters of students is 90 score points.
- Students who use strategies to control their own learning, based on their reports of their own behaviour. The performance gap between students who use these kinds of strategies and those who do not is 68 points.
- Students who reported using strategies to "elaborate" what they read, by relating it to what they already know. The average gap was just 14 points, and significant in 40 of the 65 countries that participated in PISA.

When measured by the awareness of strategies to summarise information, the top quarter of students read at least one proficiency level (72 score points) higher, on average, than the bottom quarter in all OECD countries and in all but six partner countries. The gap is much greater in some countries, exceeding 120 score points in Austria, Belgium, the Czech Republic, Japan, Luxembourg, New Zealand and Switzerland.

Students who show the greatest awareness of strategies to summarise, understand and remember information are classified as "deep" readers and learners in the PISA analysis. Students who read a variety of material for enjoyment are classified as "wide" readers. The analysis shows that students who read deeply and widely perform particularly well. However, students who are wide readers but are unaware of effective learning strategies tend to perform below average. On the other hand, deep readers show around average performance even when they rarely read for enjoyment.

Definitions

Students were rated on their awareness of effective reading and learning strategies according to how well they could rank the value of various practices in the "correct" order, as assessed by reading experts. Examples of such statements for summarising strategies are: "I carefully check whether the most important facts in the text are represented in the summary" (most effective); and "I try to copy out accurately as many sentences as possible" (least effective). This testing of students' awareness of strategies was separate from questions about their actual practices in *using* them. For example, students were rated on their use of control strategies based on whether they reported doing such things as figuring out in advance what they need to learn.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

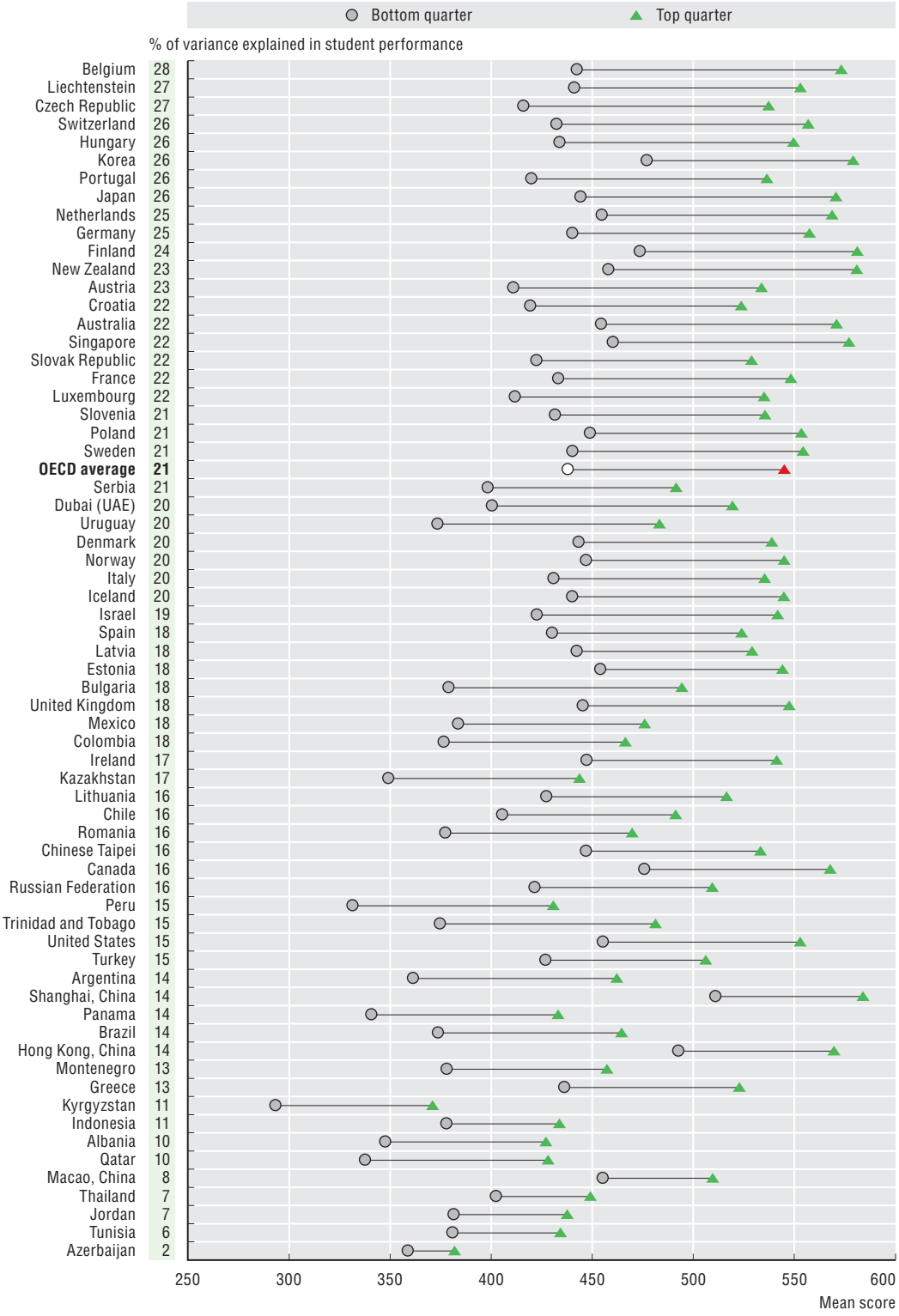
Going further

Further analysis is presented in Chapter 1 in *PISA 2009 Results Volume III, Learning to Learn: Student Engagement, Strategies and Practices*. Full data on student learning strategies are shown in Tables III.1.14-III.1.23 at the back of that volume.

Further reading from the OECD

Learners for Life: Student Approaches to Learning (2003).

Figure 3.5. **How students' awareness of effective strategies to summarise information relates to their reading performance**



Note: Countries are ranked in descending order of the percentage of explained variance in student performance.

Source: OECD (2010), *PISA 2009 Results, Volume III, Learning to Learn: Student Engagement, Strategies and Practices*, Figure III.1.14, available at *http://dx.doi.org/10.1787/888932360176*.

Reading for enjoyment

- *Fewer students reported reading for enjoyment in 2009 compared to 2000.*
- *This decline was seen in the majority of countries that participated in PISA in both years.*
- *The greatest decline in reading for enjoyment occurred in Chile, the Czech Republic, Finland, Mexico, Portugal and the partner countries Argentina, Liechtenstein and Latvia. The greatest increase in reading for enjoyment occurred in Japan.*

What it means

Reading for enjoyment is an important part of the engagement in reading that helps students perfect their reading skills. PISA results show that, in all countries, students who enjoy reading the most perform significantly better than students who enjoy reading the least. While the majority of students do read for enjoyment, the growth in the minority who do not should prompt schools to try to engage students in reading activities that they find relevant and interesting.

Findings

Students in 2009 tended to be less enthusiastic about reading than their counterparts were in 2000. The percentage of students who reported reading for enjoyment fell from 69% to 64%.

In 22 of the 38 countries for which comparable data are available, the percentage of 15-year-olds who reported that they enjoy reading fell. In 10 countries it did not change significantly, and in 6 countries the percentage rose.

The largest declines in reading enjoyment, by at least double the average rate, occurred in Chile, the Czech Republic, Finland, Mexico, Portugal and the partner countries Argentina, Liechtenstein and Latvia. In some cases, students who had been very enthusiastic about reading in 2000 were considerably less so in 2009. For example, in Portugal, more than one student in three did not read for enjoyment in 2009, compared to fewer than one in five in 2000.

In contrast, the percentage of students who reported that they read for enjoyment rose in six countries. The increase was greatest in Japan, where the smallest proportion of students – just 45% – reported that they read for enjoyment in 2000. By 2009 this proportion had grown to 56%, although this was still well below the OECD average.

Definitions

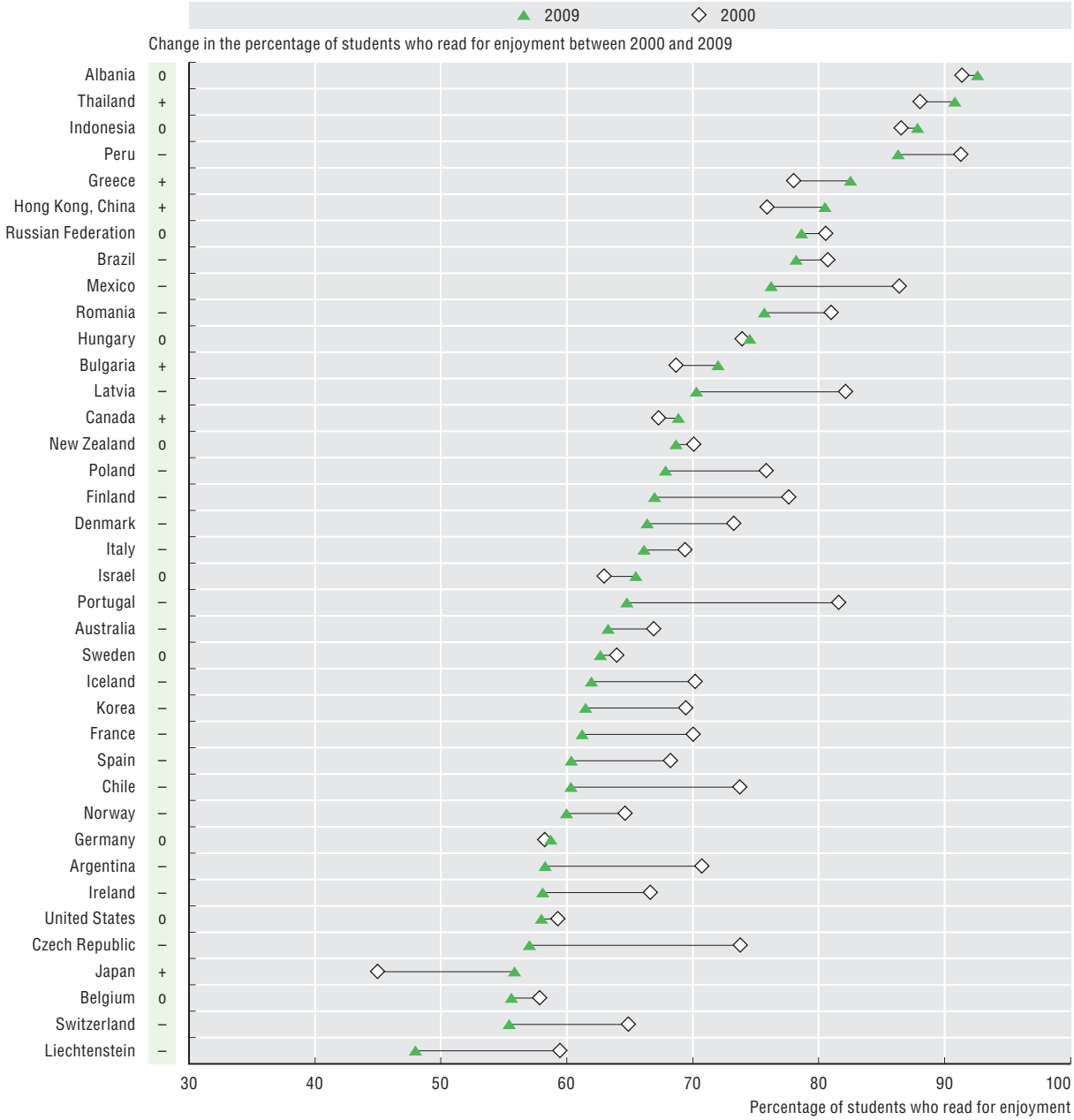
Students were asked how much time they spend each day reading for enjoyment. The possible answers ranged from "I do not read for enjoyment" (students who chose that statement were classified as those who do not read for enjoyment) to "more than 2 hours a day" (students who chose statements indicating that they read for enjoyment from up to 30 minutes a day to more than 2 hours a day were classified as those who read for enjoyment). Only those countries that have valid results in both PISA 2000 and 2009 are compared.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in reading for enjoyment between 2000 and 2009 are presented in Chapter 5 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.5.1 at the back of that volume.

Figure 3.6. **Percentage of students who read for enjoyment in 2000 and 2009**



	2009 higher than 2000	2009 lower than 2000	No statistically significant difference
95% confidence level	+	–	o

Note: Countries are ranked in descending order of percentage of students who read for enjoyment in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since* 2000, Figure V.5.1, available at *http://dx.doi.org/10.1787/888932360024.*

Reading for enjoyment, by gender and background

- *Twice as many boys as girls lost interest in reading between 2000 and 2009, widening the gender gap even further.*
- *Students from less advantaged backgrounds lost interest in reading at a greater rate than those from advantaged backgrounds.*
- *Boys from disadvantaged backgrounds show even less interest in reading than they did in 2000. In Portugal and the partner country Latvia, the proportion of these students who reported reading for enjoyment shrunk from over two-thirds to less than 50%.*

What it means

The gender gap in enjoyment of reading helps to explain why girls continue to outperform boys significantly in reading. It is also worrying that the impact of socio-economic background on reading for enjoyment, which had been relatively weak in 2000, is growing stronger. These trends highlight the particular urgency of finding ways to engage boys from disadvantaged backgrounds in reading for pleasure.

Findings

The drop in the percentage of students who read for enjoyment, by five percentage points overall between 2000 and 2009, was more severe for some groups than for others.

Enjoyment of reading fell by six percentage point for boys compared to three percentage points for girls, on average in OECD countries. This means that the gap between boys' and girls' enjoyment of reading widened. The percentage of boys who reported that they enjoy reading fell from 60% in 2000 to 54% in 2009.

The widening of the gender gap in enjoyment of reading applied to students from both socio-economically advantaged and disadvantaged backgrounds. However, the decline in reading for enjoyment was greater among disadvantaged students than among advantaged students. As a result, the gap between the most and least advantaged students in reading for enjoyment widened, on average, from 10 to 16 percentage points.

The combined impact of widening social and gender differences in reading for enjoyment means that socio-economically disadvantaged boys have become much less likely to enjoy reading. In 2000, a clear majority of these boys, 57%, reported that they read for enjoyment. By 2009, only a minority of 46% did. This decline of 11 percentage points was over double the average decline in reading for enjoyment. In contrast, among the most advantaged girls, 82% reported that they read for enjoyment in 2009, down only slightly from 84% in 2000.

In some countries, the drop in the proportion of disadvantaged boys who reported that they read for enjoyment has been particularly marked. In Portugal and the partner country Latvia, for example, that proportion shrunk from more than 66% to under 50%; in the Czech Republic, it fell from 59% to just 37%.

Definitions

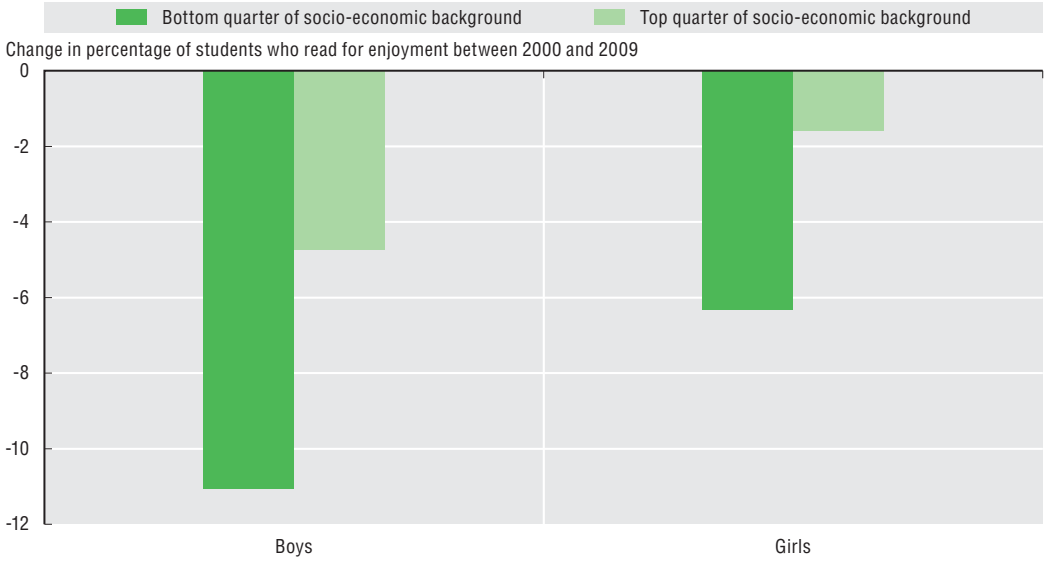
Students were asked how much time they spend each day reading for enjoyment. The possible answers ranged from "I do not read for enjoyment" (students who chose that statement were classified as those who do not read for enjoyment) to "more than 2 hours a day" (students who chose statements indicating that they read for enjoyment from up to 30 minutes a day to more than 2 hours a day were classified as those who read for enjoyment). Only those countries that participated in both PISA 2000 and 2009 are compared. The classification of students by socio-economic background is based on an index reflecting social, economic and cultural characteristics of students' families, as reported by the students.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

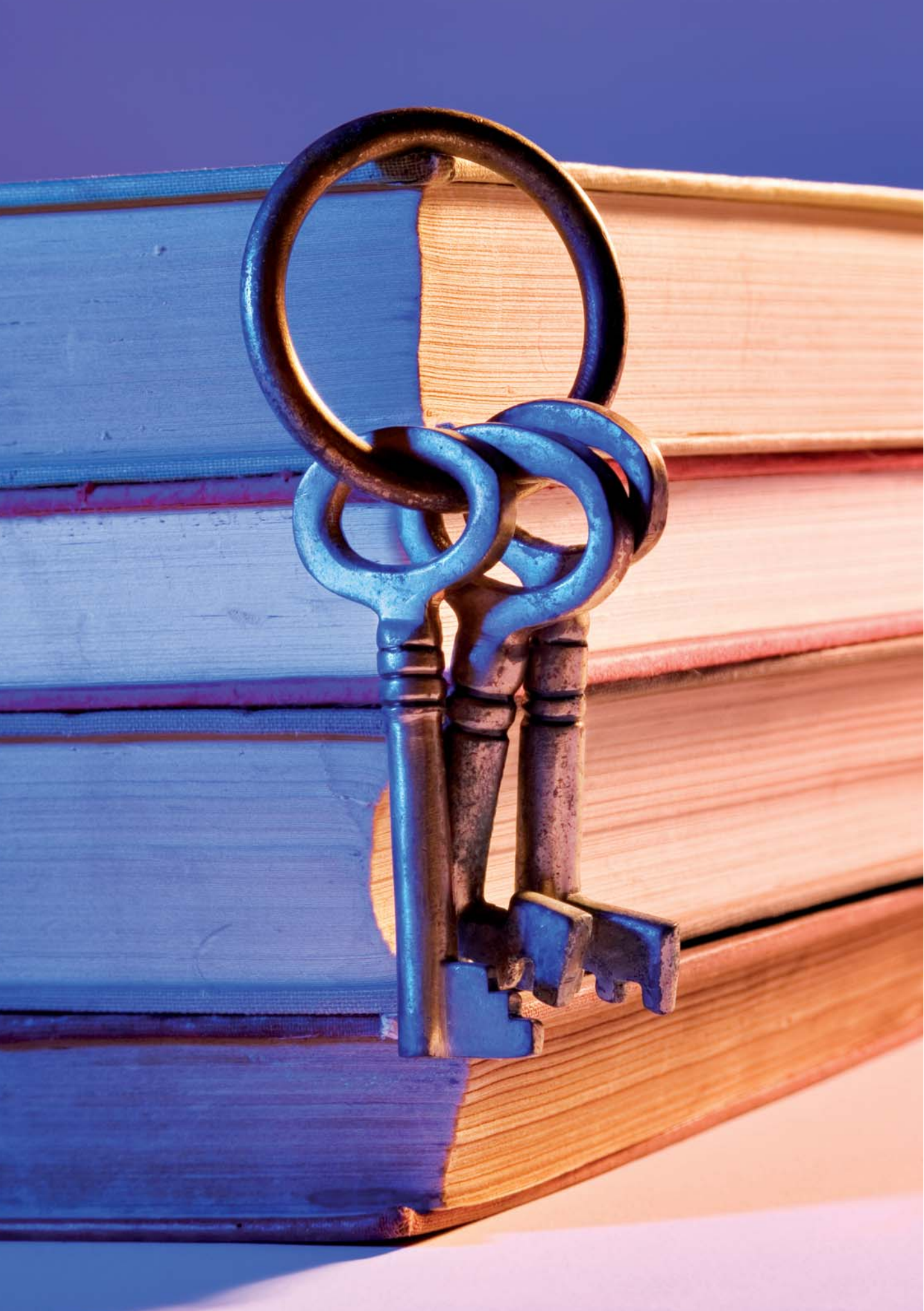
Going further

Further analysis of changes in reading for enjoyment between 2000 and 2009 are presented in Chapter 5 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Tables V.5.1 and V.5.4 at the back of that volume.

Figure 3.7. **Change in the percentage of boys and girls who read for enjoyment between 2009 and 2000, by socio-economic background**



Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since* 2000, Figure V.5.10, available at *http://dx.doi.org/10.1787/888932360024.*



4. WHAT MAKES A SCHOOL SUCCESSFUL?

Does selecting and grouping students affect reading performance?

How do education systems and schools select and group students?

Does school governance affect students' reading performance?

How are schools governed in different countries?

How do countries/economies allocate educational resources?

Do students perform better in more disciplined schools?

How favourable is the learning climate in schools?

Trends

Teacher-student relations

Disciplinary climate during lessons

Does selecting and grouping students affect reading performance?

- *In countries where students repeat grades more often, reading scores tend to be lower and the association between reading performance and students' socio-economic background tends to be stronger. The same is true in countries where more schools transfer difficult students to other schools.*
- *In countries where more schools groups students by ability in all subjects, reading scores are lower.*
- *Where schools select students for different learning programmes at a young age, differences in achievement between socio-economically advantaged and disadvantaged students tend to be greater.*

What it means

By measuring aspects of student selection and grouping across 34 OECD countries, PISA can show the general relationship between these policies and student performance in reading. The results show that some types of differentiation among students tend to be associated with lower levels of performance and less equity among students from different socio-economic backgrounds. Countries using such practices need to ensure that they do not result in inequities in learning opportunities linked to students' socio-economic backgrounds.

Findings

PISA shows that reading performance in countries where schools frequently use grade repetition is worse than in those where schools seldom have students repeat grades, even after accounting for countries' national income. Around 15% of the variation in performance across OECD countries can be explained by differences in the rates of grade repetition. Within countries too, schools where more students repeat grades tend to show lower scores in reading. And those countries with greater rates of grade repetition also show a greater impact of socio-economic background on performance. This may be because schools that have students repeat grades may have less incentive to try to improve the performance of struggling and disadvantaged students.

Another practice associated with lower scores in reading overall and greater performance gaps between students from different socio-economic backgrounds is transferring students to different schools. This practice accounts for over one-third of the performance variation across countries. Transferring students because of low academic achievement, behavioural problems or special learning needs could be linked to schools that have limited incentives to work with difficult students. Students who are transferred to other schools face difficulties in adjustment that may also affect their performance. To some extent, high transfer rates may also be symptoms, rather than a cause, of underperforming schools and school systems.

On average across OECD countries, those countries where more schools group students by ability in all subjects tend to show lower scores in reading. However, within some countries, the reverse is sometimes true.

In countries that select students at a young age for different education programmes, such as academic or vocational "tracks", there tend to be greater differences in results among students from different socio-economic backgrounds. These school systems do not show better-than-average results overall. The age of selection and socio-economic inequity may be linked because at a younger age, students are more dependent upon their parents and their parents' resources, so more advantaged families can get their children onto higher-achieving programmes.

Definitions

PISA uses the term "differentiation" to discuss these various selection policies. "Vertical differentiation" refers to the ways in which students progress through the education system 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. It can be applied by the education system or by individual schools and involves grouping students according to their interests and/or performance.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 2 of *PISA 2009 Results Volume IV, What Makes a School Successful? Resources, Policies and Practices*. Data on the effects in individual countries and economies are shown in Tables IV.2.1 to IV.2.3 at the back of that volume.

Further reading from the OECD

Learning for Tomorrow's World: First Results from PISA 2003 (2004).

Table 4.1. **How school systems' policies for selecting and grouping students are related to educational outcomes**

How these policies are related to…	…reading performance.	…equal learning opportunities for all students.
More grade repetition	**X**	**X**
Average age of entry into primary school	x	x
More school programmes	x	x
Early selection for school programmes	x	**X**
More students in selective schools	x	x
More students are transferred to other schools	**X**	**X**
More students are grouped by ability in all subjects	**X**	x

X is negatively related to performance or equity.
x Smaller symbols indicate no statistically significant relationship.
Source: OECD (2010), *PISA 2009 Results, Volume IV, What Makes a School Successful?: Resources, Policies and Practices*, Figure IV.2.1a, available at *http://dx.doi.org/10.1787/888932343380*.

How do education systems and schools select and group students?

- *In most OECD and partner countries, students are not selected for different schools and programmes before age 15. In others, they are selected at the start of secondary school.*
- *The Netherlands and Switzerland have the greatest degree of student selection across schools, grades and programmes.*
- *High-performing countries can be found among those that select and group students both the most and the least; but only in the latter countries are performance differences between socio-economically advantaged and disadvantaged students small.*

What it means

Education systems today face a major challenge in delivering equal chances to diverse student populations. Some choose to do so by educating all children together, others by differentiating between groups of students.

Findings

At the level of the education system, countries make different choices about what age to start grouping children into different classes and programmes, how many different programmes to create and whether to select students for these classes and programmes by ability. Most countries do not select students before the age of 15, so most of the students who participated in PISA either attend non-selective schools or did so until recently. However, in 15 countries, 9 of them OECD members, students tend to have been divided into various education programmes, such as academic or vocational "tracks" from early in their secondary education.

At the level of individual schools, students can be grouped by ability and, in the case of low-achieving students or those with behavioural problems or special learning needs, can be transferred to different schools. These practices are relatively rare in most countries, but are applied in some.

Most 15-year-old students in most countries are in class with other students of a similar age, having progressed together through the school system. However, grade repetition is very common in some school systems: PISA results show that in 11 countries, at least one-third of 15-year-olds reported that they had repeated at least one year of school.

Definitions

Countries listed in the chart on the facing page are grouped on the basis of "latent profile analysis", a technique used to classify countries into a number of groups that share similar features in several aspects related to selecting and grouping students.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 3 of *PISA 2009 Results Volume IV, What Makes a School Successful? Resources, Policies and Practices*. Data on differentiation in individual countries and economies are shown in Tables IV.3.1 to IV.3.4 at the back of that volume.

Table 4.2. **How school systems select and group students for schools, grades and programmes**

This figure divides countries into groups with similar characteristics according to how students are grouped and selected at the system level, the school level and for different grades.

				In a group of countries with *low* levels of vertical differentiation…		In a group of countries with *high* levels of vertical differentiation…	
				…on average 7% of 15-year-olds have repeated one grade or more… …and 7% did not start school at the usual ages.		…on average 29% of 15-year-olds have repeated one grade or more… …and 11% did not start school at the usual ages.	
				In a group of countries with *low* levels of horizontal differentiation at the school level...	In a group of countries with high levels of horizontal differentiation at the school level...	In a group of countries with low levels of horizontal differentiation at the school level…	In a group of countries with high levels of horizontal differentiation at the school level...
				…on average 15% of students are in schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs... …and 8% of students are in schools that group students by ability in all subjects.	…on average 33% of students are in schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs... …and 38% of students are in schools that group students by ability in all subjects.	…on average 15% of students are in schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs… …and 8% of students are in schools that group students by ability in all subjects.	…on average 33% of students are in schools that transfer students to other schools due to low achievement, behavioural problems or special learning needs... …and 38% of students are in schools that group students by ability in all subjects.
In a group of countries with *low* levels of horizontal differentiation at the system level…	…on average 15-year-olds are enrolled in 1.1 separate programmes…	…the average first age of selection is 15.8...	…and 17% of students are in selective schools.	Australia,* Canada,** Denmark, Estonia,** Finland,** Greece, Iceland,** New Zealand,* Norway,** Poland,* Sweden, United States, United Kingdom, Kazakhstan, Latvia, Lithuania, Russian Federation	Jordan	Spain, Argentina, Brazil, Tunisia, Uruguay	Chile, Colombia, Peru
In a group of countries with *medium* levels of horizontal differentiation at the system level…	…on average 15-year-olds are enrolled in 3 separate programmes…	…the average first age of selection is 14.5...	…and 42% of students are in selective schools.	Ireland; Israel; Italy; Japan;** Korea;** Slovenia; Albania; Azerbaijan; Dubai (UAE); Hong Kong, China;** Montenegro, Shanghai-China;* Thailand	Indonesia, Kyrgyzstan, Qatar, Romania, Chinese Taipei	Mexico, Portugal	Luxembourg; Macao, China; Panama
In a group of countries with *high* levels of horizontal differentiation at the system level…	…on average 15-year-olds are enrolled in 4.3 separate programmes…	…the average first age of selection is 11.2...	…and 61% of students are in selective schools.	Austria, Czech Republic, Hungary, Slovak Republic, Croatia, Liechtenstein, Singapore*	Turkey, Bulgaria, Serbia	Belgium,* Germany, Trinidad and Tobago	Netherlands,* Switzerland*

* Perform higher than the OECD average.

** Perform higher than the OECD average and where the relationship between students' socio-economic background and performance is weaker than the OECD average.

Source: OECD (2010), *PISA 2009 Results, Volume IV, What Makes a School Successful?: Resources, Policies and Practices*, Figure IV.3.2, available at *http://dx.doi.org/10.1787/888932343399*.

Does school governance affect students' reading performance?

– *Countries where schools have greater responsibility for their curricular and assessment policies tend to show better student performance.*

– *In the countries that have systems to ensure accountabilty for student performance, schools that are granted autonomy over resource allocation achieve higher average scores.*

– *Within countries, schools that compete for enrolment tend to show better results; but countries with more school competition do not necessarily show better student performance in reading.*

What it means

Since the early 1980s, educational reforms in many countries have intended to improve the quality of instruction in schools by offering a greater diversity of courses and greater autonomy for schools to respond to local needs, allowing schools to compete for enrolment and providing more choice for parents. PISA results suggest that some features of autonomy and accountability are associated with better performance. Yet some of the assumptions underlying school competition and choice have been called into question. It is unclear, for example, whether parents have the necessary information to choose the best schools for their children. It is also unclear whether parents always give sufficient priority to the quality of the school when making these choices. And school choice may also lead to the unintended racial, ethnic or socio-economic segregation of schools. Autonomy, evaluation, governance and choice can be combined in many ways, with varying effects on student performance.

Findings

In countries where schools enjoy autonomy over their curricula and assessments, students tend to perform better, after accounting for national income. School autonomy over these matters accounts for around 25% of the performance differences among countries that participated in PISA.

While other relationships between a single feature of school governance and student performance are harder to discern, analyses of PISA results have concluded that:

- In countries where schools have greater autonomy over what is taught and how students are assessed, students tend to perform better.
- Within those countries where schools post achievement data publicly and, in so doing, are held accountable for performance results, those schools that enjoy greater autonomy over resource allocation tend to perform better than those granted less autonomy over their curricula. However, in countries where there are no such accountability arrangements, the reverse is true.
- A more competitive environment, in which many schools compete for student enrolment, does not automatically produce better learning outcomes.
- Within many countries, schools that compete more for students tend to show higher levels of student performance in reading, but this is often accounted for by the higher socio-economic status of the students in these schools. Parents with a higher socio-economic status are more likely to take a school's academic performance into consideration when choosing a school for their children.

Definitions

PISA 2009 asked school principals to report whether the teachers, the principal, the school's governing board, the regional or local education authorities or the national education authority had considerable responsibility for allocating resources to schools (appointing and dismissing teachers, establishing teachers' starting salaries and salary raises, formulating school budgets and allocating them within the school) and responsibility for the curriculum and instructional assessment within the school (establishing student-assessment policies, choosing textbooks, determining which courses are offered and the content of those courses).

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 2 of *PISA 2009 Results Volume IV, What Makes a School Successful? Resources, Policies and Practices*. Data on the effects in individual countries and economies are shown in Tables IV.2.1 and IV.2.4 to IV.2.10 at the back of that volume.

Table 4.3. **How the governance of school systems is related to educational outcomes**

	How these types of school governance are related to…	….reading performance.	…equal learning opportunities for all students.
School autonomy	Systems whose schools have more responsibility for curricula and assessments	✓	✓
	Systems whose schools have more responsibility for resource allocation	✓	x
School competition	Systems where more schools compete for enrolment	✓	x
	Systems where there are more student in private schools	✓	x

x is negatively related to performance or equity.

✓ is positively related to performance or equity. Smaller symbols indicate no statistically significant relationship.

Source: OECD (2010), *PISA 2009 Results, Volume IV, What Makes a School Successful?: Resources, Policies and Practices*, Figure IV.2.4a, available at *http://dx.doi.org/10.1787/888932343380*.

How are schools governed in different countries?

- *Most education systems now grant substantial autonomy over curricula and assessments to individual schools.*
- *Most school systems still have limited amounts of competition for student enrolment.*
- *More school autonomy and less school competition are characteristics of many high-performing school systems, but they do not guarantee strong reading performance.*

What it means

Countries that have devolved authority over curricula and assessments to individual schools tend to perform well in PISA. However, while the general trend has been towards greater autonomy, countries have taken different paths in how, and the extent to which, they devolve power to schools and create more competition among schools by allowing greater choice for parents and students. This analysis considers these differences by dividing countries into groups with similar combinations of characteristics.

Findings

Across OECD countries, the most common pattern is to give schools discretion over curricular and assessment decisions, but to restrict competition for enrolment among schools. School systems that opt for this combination of greater autonomy but less school competition tend to have relatively few private schools. Twenty-three OECD countries and 15 partner countries and economies share this configuration.

In another 4 OECD countries and 11 partner countries, both competition and autonomy are relatively restricted.

Six OECD countries and five partner countries and economies offer high levels of both autonomy and competition, either in the form of a high prevalence of private schools or greater competition among schools for enrolment. In these school systems, schools have the authority to design curricula, and parents and students can choose among a variety of schools for enrolment.

School systems with above-average performance levels and a relatively weak association between performance and students' socio-economic backgrounds tend to grant greater autonomy to schools in formulating and using curricula and assessments and have less school competition. However, not all OECD countries that share this configuration show above-average performance in reading. This suggests that while granting more autonomy and having less school competition is consistent with developing a successful school system, it does not automatically do so. Other conditions must also be in place for this configuration to be effective in improving performance and equity.

Definitions

Countries listed in the chart on the facing page are grouped on the basis of "latent profile analysis", a technique used to classify countries into a number of groups that share similar features in several aspects related to school governance.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 3 of *PISA 2009 Results Volume IV, What Makes a School Successful? Resources, Policies and Practices*. Data on autonomy and school competition in individual countries and economies are shown in Tables IV.3.6 to IV.3.8 at the back of that volume.

Table 4.4. **How school systems are governed**

This figure divides countries into groups with similar characteristics according to the amount of school autonomy and school competition.

					In a group of countries with *less* school competition…	In a group of countries with *more* school competition…
					…on average 73% of students are in schools that compete with other schools for enrolment… …and 8% of students are in private schools.	…on average 89% of students are in schools that compete with other schools for enrolment… …and 52% of students are in private schools.
In a group of countries with *less* school autonomy over curriculum and assessment...	…on average 61% of students are in schools that establish assessment policies…	…55% of students are in schools that choose which textbooks are used…	…14% of students are in schools that determine course content…	…and 18% of students are in schools that decide which courses are offered.	Greece, Mexico, Portugal, Turkey, Albania, Azerbaijan, Bulgaria, Croatia, Kazakhstan, Jordan, Montenegro, Qatar, Serbia, Tunisia, Uruguay,	–
In a group of countries with *more* school autonomy over curriculum and assessment...	…on average 92% of students are in schools that establish assessment policies…	…97% of students are in schools that choose which textbooks are used…	…85% of students are in schools that determine course content…	…and 87% of students are in schools that decide which courses are offered.	Austria; Canada;** Czech Republic; Denmark; Estonia;** Finland;** Germany; Hungary; Iceland;** Israel; Italy; Japan;** Luxembourg; New Zealand;* Norway;** Poland;* Slovak Republic; Slovenia; Spain; Sweden; Switzerland;* United Kingdom; United States; Panama; Argentina; Brazil; Colombia; Kyrgyzstan; Latvia; Liechtenstein; Lithuania; Peru; Romania; Russian Federation; Shanghai, China;* Singapore;* Thailand; Trinidad and Tobago	Australia;* Belgium;* Chile; Ireland; Korea;** Netherlands;* Dubai (UAE); Hong Kong, China;** Indonesia; Macao, China; Chinese Taipei.

* Perform higher than the OECD average.

** Perform higher than the OECD average and where the relationship between students' socio-economic background and performance is weaker than the OECD average.

Source: OECD (2010), *PISA 2009 Results, Volume IV, What Makes a School Successful?: Resources, Policies and Practices*, Figure IV.3.5, available at *http://dx.doi.org/10.1787/888932343399*.

How do countries/economies allocate educational resources?

- *Students perform better in those countries that pay teachers more, relative to national income, while smaller classes are not necessarily associated with better reading performance.*
- *Within countries, schools with more resources attain higher scores, largely because their students tend to come from more advantaged backgrounds.*
- *Some countries choose to keep class size large and pay teachers higher salaries. This group includes the top performers in reading, such as Japan, Korea, the partner economies Hong Kong, China and Shanghai, China and the partner country Singapore.*

What it means

School systems need to balance the need for adequate levels of resources with other demands on public spending. Systems vary in how they spend their resources, from buying textbooks to lengthening the school year to improving the physical structure of schools to providing more extracurricular activities for students. However, most extra spending is directed either towards higher teachers' salaries or smaller class size. PISA results show teachers' salaries to be an important factor linked to student performance among those examined.

Findings

Some OECD countries spend much more on education than others. Yet most OECD countries opt to devote their resources to maintaining relatively small classes and modest teachers' salaries.

Four OECD countries show the opposite pattern, with much higher-than-average salaries for teachers and large classes. Japan and Korea do so in the context of a high level of spending on education, concentrated on generous pay for teachers and achieving strong learning outcomes. In Mexico and Chile, on the other hand, overall spending is relatively low, but by accepting larger classes, these countries manage to keep teachers' pay high.

All partner countries and economies spend relatively less on education than OECD countries do. Around one-third of these countries choose to focus investment on higher salaries for teachers. Hong Kong, China; Shanghai, China and Singapore are among the top five performers in reading, even though they spend very modest amounts on education in absolute terms.

Definitions

Countries listed in the chart on the facing page are grouped on the basis of "latent profile analysis", a technique used to classify countries into a number of groups that share similar features in several aspects related to educational resources.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 3 of *PISA 2009 Results Volume IV, What Makes a School Successful? Resources, Policies and Practices*. Data on resources in individual countries and economies are shown in Tables IV.3.21 to IV.3.23 at the back of that volume.

Table 4.5. **How school systems allocate resources for education**

This figure divides countries into groups with similar characteristics according to how much is spent for education and how it is allocated.

		In a group of countries with *small* class size and/or *low* teachers' salaries…	In a group of countries with *large* class size and *high* teachers' salaries…
		…there are an average of 23 students in a class on the language of instruction… …and teachers earn 1.18 times GDP/capita.[1]	…there are an average of 36 students in a class on the language of instruction… …and teachers earn 1.72 times GDP/capita.[1]
In a group of countries with *low* cumulative expenditure on education…	…an average of USD 39 463 is spent on educating each student from age 6 to 15.	Czech Republic, Estonia,** Hungary, Greece, Israel, New Zealand,* Poland,* Portugal, Slovak Republic, Turkey, Albania, Argentina, Azerbaijan, Bulgaria, Croatia, Dubai (UAE), Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Montenegro, Panama, Peru, Qatar, Romania, Russian Federation, Serbia, Tunisia, Trinidad and Tobago, Uruguay	Chile; Mexico; Brazil; Colombia; Hong Kong, China;** Jordan; Indonesia; Macao, China; Shanghai, China;* Singapore;* Chinese Taipei; Thailand
In a group of countries with *high* cumulative expenditure on education…	…an average of USD 81 238 is spent on educating each student from age 6 to 15.	Australia,* Austria, Belgium,* Canada,** Denmark, Finland,** France, Germany, Iceland,** Ireland, Italy, Luxembourg, Norway,** Netherlands,* Slovenia, Spain, Sweden, Switzerland,* United Kingdom, United States	Japan,** Korea**

1. This is the weighted average of upper and lower secondary teachers. The average is computed by weighting teachers' salaries for upper and lower secondary education according to how many 15-year-olds are enrolled (for countries with valid information on both if 15-year-old students attend both upper and lower secondary schools).

* Perform higher than the OECD average.

** Perform higher than the OECD average and where the relationship between students' socio-economic background and performance is weaker than the OECD average.

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.

Source: OECD (2010), *PISA 2009 Results, Volume IV, What Makes a School Successful?: Resources, Policies and Practices*, Figure IV.3.7, available at *http://dx.doi.org/10.1787/888932343399*.

Do students perform better in more disciplined schools?

– *In many countries, students do better in schools with a stronger disciplinary climate, good teacher-student relations and positive teacher attitudes and behaviour, even after accounting for students' and schools' socio-economic backgrounds.*

– *In nearly half of the countries that participated in PISA, students do better in schools whose principals reported high levels of parental pressure for higher academic standards and achievement; but in most cases, this effect is wholly explained by the fact that it is usually more socio-economically advantaged parents who exert this pressure.*

What it means

Educational policies and practices can only be effective if they are implemented in a climate conducive to learning. PISA results show which aspects of the learning environment are strongly related to better student performance.

Findings

In many countries, students perform better in schools with a better disciplinary climate. To some extent, this is because students in these schools are more likely to come from more socio-economically advantaged backgrounds. However, even after accounting for this effect, the relationship remains significant in 16 OECD countries and 22 partner countries and economies. It is particularly strong in the Netherlands and the partner countries and economies Azerbaijan; Hong Kong, China; Macao, China and Romania. In these countries, schools attain higher scores in reading where there is the least classroom disruption, regardless of the schools' socio-economic background.

In some countries, students perform better in reading in those schools where students reported that they have good relations with teachers. This link is strongest in Ireland, Japan and the partner country Jordan, after accounting for socio-economic background. While the highest-performing schools do not necessarily have the strongest teacher-student relations, in most countries, individual students who perceive these relations to be strong are more likely to do well in reading.

In 29 countries, students perform noticeably better in those schools whose principals reported that parents expect high academic standards and exert pressure for these standards to be achieved. However, this is largely linked to the fact that parents with higher socio-economic status are more likely to bring such pressure to bear, and their children could be expected to perform better anyway. Once the link with socio-economic status has been accounted for, there is no effect, on average, across OECD countries, although in some countries the relationship remains apparent.

Teacher-related factors that affect school climate, such as teacher absenteeism and low expectations for students, also show a strong association with student performance in a number of countries.

Definitions

These aspects of the environment at school are based on reports by students and by school principals:

- For student-teacher relations and disciplinary climate, students were asked about their experiences in school.
- Teachers' stimulation of students' engagement in reading was measured through students' reports on their interactions with teachers, such as how often they are asked to explain the meaning of a text.
- Teacher-related factors affecting school climate were measured through principals' reports on how teachers' behaviour and attitudes, such as their expectations of students, affect learning.
- Parents' expectations of high academic standards and achievement and the pressure they put on schools to meet these expectations were evaluated by questioning school principals.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 4 of *PISA 2009 Results Volume IV, What Makes a School Successful? Resources, Policies and Practices*. Data on the effects in individual countries and economies are shown in Table IV.2.13 at the back of that volume.

Table 4.6. **Countries/Economies where the learning environment at school is related to reading performance**

This figure divides countries into groups with similar charasteritics according to the learning environment.

	Without accounting for the socio-economic and demographic background of students and schools		With accounting for the socio-economic and demographic background of students and schools	
	…students perform worse in reading.	…students perform better in reading.	…students perform worse in reading.	…students perform better in reading.
In schools with better teacher-student relations…	Austria, Germany, Spain, Switzerland Argentina, Colombia, Croatia, Kazakhstan, Kyrgyzstan, Montenegro, Panama, Serbia, Uruguay	Australia, Denmark, Finland, Iceland, Ireland, Israel, Japan, Mexico Hong Kong, China; Jordan; Qatar; Shanghai, China; Tunisia	Austria Kazakhstan, Kyrgyzstan	Australia, Czech Republic, Estonia, Greece, Iceland, Ireland, Israel, Japan, Mexico, Portugal Bulgaria; Brazil; Hong Kong, China; Jordan; Peru; Qatar; Tunisia
In schools with better disciplinary climates...		Australia, Austria, Belgium, Czech Republic, Denmark, France, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey Azerbaijan; Croatia; Dubai (UAE); Hong Kong, China; Kazakhstan; Kyrgyzstan; Lithuania; Macao, China; Montenegro; Panama; Qatar; Romania; Russian Federation; Singapore; Serbia; Shanghai, China; Trinidad and Tobago; Uruguay		Australia, Austria, Czech Republic, Denmark, Greece, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Poland, Slovak Republic, Slovenia, Spain Azerbaijan; Brazil; Colombia; Croatia; Dubai (UAE); Hong Kong, China; Jordan; Kazakhstan; Kyrgyzstan; Lithuania; Latvia; Macao, China; Panama; Peru; Qatar; Romania; Russian Federation; Shanghai, China; Singapore; Chinese Taipei; Trinidad and Tobago; Uruguay
In schools where teachers' attitudes and behaviours positively affect student learning...		Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Slovak Republic, Spain, Switzerland, United Kingdom, United States Argentina; Bulgaria; Brazil; Croatia; Dubai (UAE); Hong Kong, China; Indonesia; Singapore; Trinidad and Tobago; Uruguay	Chinese Taipei	Austria, Belgium, Chile, Czech Republic, Estonia, Germany, Greece, Israel, Italy, Japan, Korea, Mexico, Netherlands, Spain Argentina, Brazil, Croatia, Romania, Thailand, Uruguay
In schools where more parents expect the school to set and achieve high academic standards…	Azerbaijan	Belgium, Canada, Chile, Czech Republic, Denmark, Greece, Ireland, Israel, Italy, Japan, Korea, New Zealand, Norway, Poland, Portugal, Slovenia, Sweden, Turkey, United Kingdom Albania, Brazil, Croatia, Kazakhstan, Lithuania, Latvia, Russian Federation, Singapore, Trinidad and Tobago, Uruguay	Azerbaijan	Canada, Italy, New Zealand, Norway Bulgaria, Kazakhstan, Lithuania, Latvia, Trinidad and Tobago

Note: Only those school systems where there is a statistically significant relationship between the learning environment and reading performance are listed.

Source: OECD (2010), *PISA 2009 Results, Volume IV, What Makes a School Successful?: Resources, Policies and Practices*, Figure IV.2.12, available at *http://dx.doi.org/10.1787/888932343380*.

How favourable is the learning climate in schools?

– *In most countries, teachers and students enjoy good relations. Student-teacher relations are weakest in Japan, Korea, Poland and Slovenia.*

– *In most countries, classrooms are orderly most of the time. Classroom disorder is reported most frequently in Finland, Greece, the Netherlands and the partner country Argentina.*

What it means

Research into what makes schools effective finds that learning requires an orderly and co-operative environment, both in and outside the classroom. PISA results show that students who reported having good relations with teachers and a strong disciplinary climate in the classroom tend to perform better in reading.

Findings

Students in both OECD and partner countries and economies are generally satisfied with the quality of their relationships with teachers. For example, 85% of students agreed or strongly agreed that they get along with most of their teachers, and 79% reported that teachers are available if students need extra help.

Nevertheless, there are considerable variations in the strength of teacher-student relations. Overall, they are strongest in Canada, Portugal, Turkey, the United States and the partner countries and economy Albania, Azerbaijan, Colombia, Dubai (UAE), Jordan, Kazakhstan, Kyrgyzstan, Panama and Peru. Teacher-student relations are weakest in Japan, Korea, Poland and Slovenia.

One aspect of these relations that varies greatly across countries is whether students feel that teachers are interested in their well-being. Only 28% of students in Japan and 30% in Slovenia believe this, compared to over 80% in the United States.

A majority of students in all countries enjoy orderly classrooms. For example, on average across OECD countries, three-quarters of students reported never or only in some lessons are they not able to start class work as soon as lessons begin. The most common form of disruption reported is noise, with nearly one-third of students reporting that it affects learning in most or all lessons. On the other hand, less than one-fifth of students reported that disruption prevents them from working well in most or all lessons.

Overall, the disciplinary climate is most favourable in Japan, Korea, Germany and the partner countries and economies Albania; Azerbaijan; Hong Kong, China; Indonesia; Kazakhstan; Kyrgyzstan; Latvia; Lithuania; Montenegro; Romania; the Russian Federation; Shanghai, China and Thailand. It is least favourable in Finland, Greece, the Netherlands and the partner country Argentina. In these countries, between 40% and 50% of students reported that there is noise and disorder in most or all classes.

The greatest variation in disciplinary climate is reported in Austria, Ireland, Luxembourg and Slovenia. In these countries, some students enjoy relatively orderly classrooms while others reported that their lessons were regularly disrupted. Some of this variation occurs within schools. However, in the Czech Republic, Estonia, Italy, Japan, Slovenia and the partner country Latvia, differences in disciplinary climate are most closely linked to the particular school a student attends.

Definitions

For information on teacher-student relations, PISA 2009 asked students to report the extent of their agreement with several statements, including whether they get along with the teachers, whether teachers are interested in their personal well-being and whether teachers take the student seriously. For questions on disciplinary climate, students were asked to describe the frequency with which interruptions occur in reading lessons. To determine the extent to which teacher-related behaviours affect student learning, school principals 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 and absenteeism among teachers.

Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis is presented in Chapter 4 of *PISA 2009 Results Volume IV, What Makes a School Successful? Resources, Policies and Practices*. Data on individual countries and economies are shown in Tables IV.4.1 and IV.4.2 at the back of that volume.

Table 4.7. **Strength of teacher-student relations and disciplinary climate**

	Teacher-student relations					Disciplinary climate				
	% of students agreeing or strongly agreeing with the following statements					% of students reporting that the following phenomena happen "never or hardly ever" or "in some lessons"				
	I get along well with most of my teachers.	Most of my teachers are interested in my well-being.	Most of my teachers really listen to what I have to say.	If I need extra help, I will receive it from my teachers.	Most of my teachers treat me fairly.	Students don't listen to what the teacher says.	There is noise and disorder.	The teacher has to wait a long time for the students to quieten down.	Students cannot work well.	Students don't start working for a long time after the lesson begins.
OECD										
Australia	85	78	71	84	85	68	61	71	82	76
Austria	87	59	61	67	77	73	74	71	77	70
Belgium	83	63	67	84	86	72	63	68	85	71
Canada	89	80	74	89	88	71	61	72	82	73
Chile	85	74	72	77	71	74	63	65	82	70
Czech Republic	80	67	57	78	72	63	66	68	75	70
Denmark	89	79	71	79	85	72	65	78	88	82
Estonia	86	76	60	85	75	70	69	73	80	78
Finland	87	49	63	84	80	60	52	63	80	68
France	78	53	62	80	88	64	56	64	76	63
Germany	85	58	69	71	77	85	84	78	82	81
Greece	87	66	62	63	65	55	58	62	56	65
Hungary	86	68	79	77	74	71	71	69	80	78
Iceland	88	73	74	82	80	74	67	73	84	81
Ireland	82	76	63	77	81	64	65	70	81	75
Israel	83	61	68	70	80	78	75	73	77	74
Italy	82	72	62	77	79	66	68	70	81	74
Japan	73	28	63	64	74	92	90	93	87	91
Korea	79	60	57	83	75	90	77	88	90	87
Luxembourg	82	59	63	72	78	60	65	64	71	64
Mexico	86	77	77	78	75	79	73	79	83	77
Netherlands	87	61	66	85	85	68	59	63	81	55
New Zealand	88	77	73	87	86	68	61	68	82	74
Norway	84	57	55	74	74	67	61	66	77	67
Poland	81	35	60	73	71	67	74	74	79	80
Portugal	94	89	82	90	82	78	76	80	86	79
Slovak Republic	85	71	66	79	75	67	74	73	81	75
Slovenia	80	30	56	74	74	59	66	68	78	70
Spain	82	70	67	68	79	73	74	73	83	73
Sweden	89	75	71	82	82	75	67	71	83	76
Switzerland	85	69	70	82	83	72	74	74	81	76
Turkey	86	88	78	87	69	86	77	74	77	78
United Kingdom	86	78	69	88	83	73	68	74	86	81
United States	90	81	74	88	89	76	72	79	87	82
OECD average	85	66	67	79	79	71	68	72	81	75
Partners										
Albania	89	86	89	92	94	89	88	86	87	88
Argentina	83	75	73	68	80	67	57	62	74	66
Azerbaijan	90	77	86	91	89	90	90	88	87	86
Brazil	86	81	74	78	83	75	60	67	76	63
Bulgaria	85	53	71	80	73	69	72	73	75	77
Colombia	86	82	75	79	91	82	78	81	88	77
Croatia	87	65	60	69	70	59	68	69	75	73
Dubai (UAE)	89	83	75	87	79	77	72	73	83	77
Hong Kong, China	89	71	67	89	82	87	88	89	88	86
Indonesia	93	82	63	85	91	84	75	79	84	84
Jordan	83	81	77	80	71	81	75	74	76	74
Kazakhstan	93	83	80	93	89	88	93	91	88	92
Kyrgyzstan	90	69	75	89	87	86	88	84	82	86
Latvia	86	65	69	85	82	78	78	79	86	86
Liechtenstein	82	66	66	78	75	71	81	76	79	80
Lithuania	85	56	66	78	80	78	82	84	84	84
Macao, China	83	64	53	78	71	80	86	84	85	80
Montenegro	89	69	75	76	79	72	82	80	82	81
Panama	90	83	77	79	89	77	73	75	81	76
Peru	88	81	82	85	83	83	77	85	85	82
Qatar	78	77	71	80	74	72	68	66	73	70
Romania	89	62	77	74	84	89	89	89	89	87
Russian Federation	88	76	73	82	80	81	86	85	85	89
Serbia	89	86	69	72	80	63	74	74	79	75
Shanghai, China	89	81	79	90	85	85	88	90	87	89
Singapore	91	81	74	88	87	78	70	77	87	83
Chinese Taipei	88	72	64	89	83	78	81	80	84	78
Thailand	87	77	82	83	87	91	85	86	91	91
Trinidad and Tobago	84	80	67	82	78	71	69	66	81	75
Tunisia	83	51	72	77	81	76	62	66	69	65
Uruguay	88	71	81	67	73	74	67	69	80	74

Source: OECD (2010), *PISA 2009 Results, Volume IV, What Makes a School Successful?: Resources, Policies and Practices*, Figure IV.4.2, available at *http://dx.doi.org/10.1787/888932343418*.

Teacher-student relations

- *In 20 out of 38 countries, the proportion of students who reported that teachers listen to them rose significantly between 2000 and 2009.*
- *In 2009, more students reported that they were treated fairly by teachers and got extra help when they needed it than their counterparts did in 2000.*
- *Teacher-student relations improved most in countries where they had been weakest, including Germany, Korea and Japan.*

What it means

Positive student-teacher relationships are crucial for establishing a classroom environment that is conducive to learning. Research finds that students, particularly socio-economically disadvantaged students, learn more and have fewer disciplinary problems when they feel that their teachers take them seriously.

While the media sometimes depicts the climate in schools as becoming more difficult, PISA results show that relations between teachers and students have become more positive, and offer no evidence to support the notion that students are becoming progressively more disengaged from school.

Findings

In 2000, PISA results suggested that the majority of students were generally satisfied with the quality of their relations with teachers. By 2009, the quality of student-teacher relations was even better.

The increase in the proportion of students reporting that their teachers "really listen to what I have to say" exceeded 10 percentage points in Germany, Iceland, Japan, Korea and the partner country Albania. In 2000, three of these countries, Germany, Korea and Japan, showed the smallest proportion of students who so reported among the 26 OECD countries with comparable data. In Korea, for example, six in ten students in 2000 reported that teachers did not listen to them, while in Germany and Japan 50% of students so reported. In 2009, a clear majority of students (between 57% and 69%) in these three countries reported that teachers listen to them. In other aspects of teacher-student relations, similar patterns emerged in these countries. For example, in Germany, the proportion of students who reported that teachers would give them extra help if they needed it rose from 59% in 2000 to 71% in 2009.

In half of the remaining countries, there were smaller increases in the proportion of students who reported that teachers listen to them; but in six countries, that proportion shrunk, particularly in Italy (71% in 2000 to 62% in 2009) and Mexico (85% in 2000 to 77% in 2009).

The proportion of 15-year-olds who reported that they could get extra help from teachers if they needed it increased by more than 10 percentage points in Germany, Poland, Portugal and the partner countries Albania and Latvia. The greatest increase was in Poland, where the proportion of students who so reported rose from 57% to 73%.

Poland also saw a similar increase in the proportion of students who reported that teachers treat them fairly: from a low 57% in 2000 to 71% in 2009. That proportion rose by 10 percentage points or more in France, Italy and the partner economy Hong Kong, China.

Definitions

PISA 2009 asked students to agree or disagree with several statements regarding their relationships with their teachers in school. These statements focused on whether students got along with their teachers, whether teachers were interested in students' personal well-being, whether teachers took the students seriously, whether teachers were a source of support if the students needed extra help, and whether teachers treated students fairly. Similar questions were asked in 2000, so teacher-student relations could be compared across time.

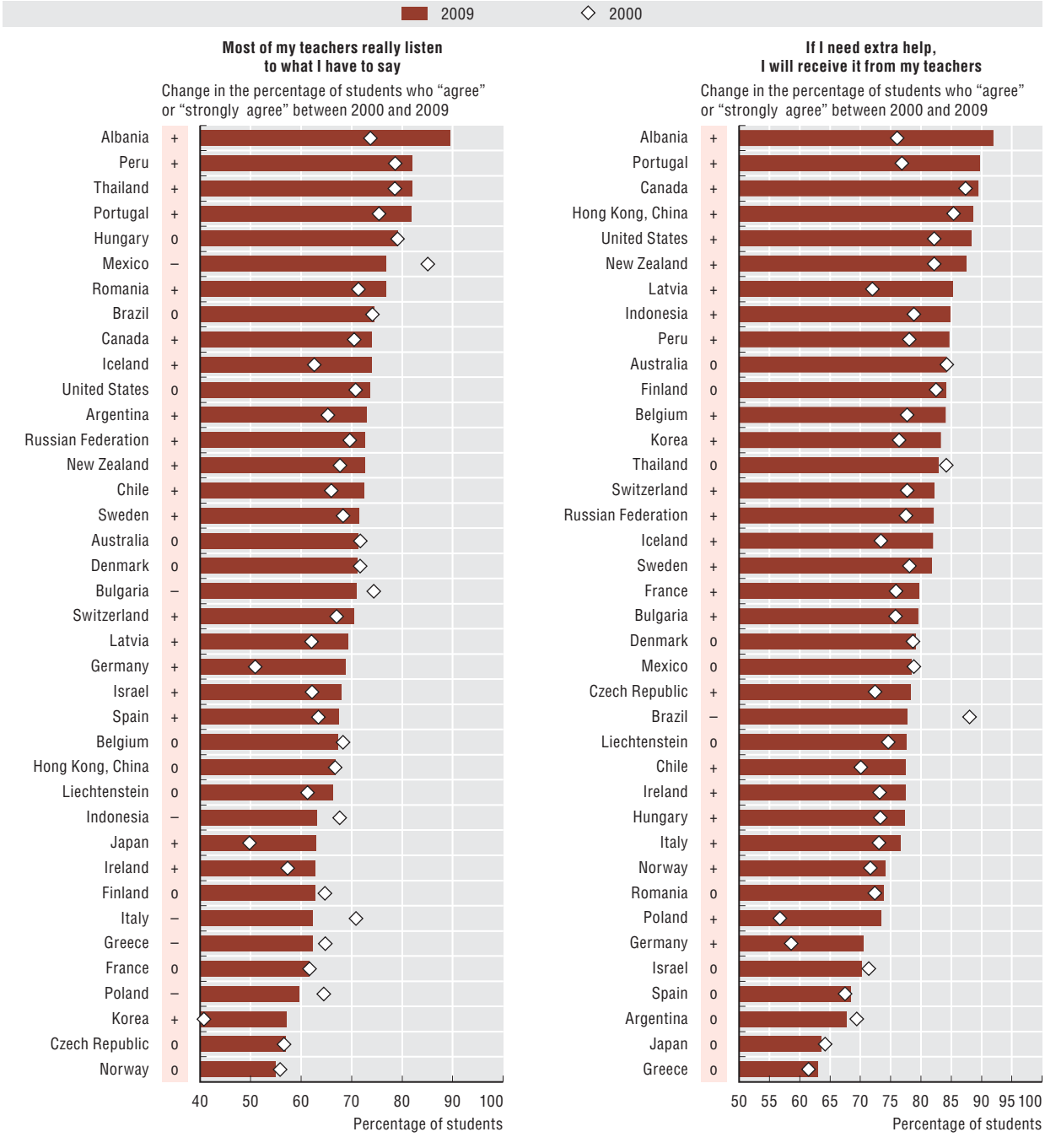
Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Going further

Further analysis of changes in student-teacher relationships between 2000 and 2009 is presented in *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.5.11 at the back of that volume.

Figure 4.1. **Change in teacher-student relations between 2000 and 2009**

Percentage of students agreeing or strongly agreeing with the following statements



	2009 higher than 2000	2009 lower than 2000	No statistically significant difference
95% confidence level	+	–	o

Note: Countries are ranked in descending order of the percentage of students on the items in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.5.11, available at *http://dx.doi.org/10.1787/888932360024*.

Disciplinary climate during lessons

– *In general across OECD countries, the disciplinary climate during lessons improved between 2000 and 2009.*

– *In 2009, students in Chile, Greece and Italy reported less noise and disruption in classes than their counterparts did in 2000. As a result, these countries now show a disciplinary climate that is closer to the average. Meanwhile, students in Australia, the Czech Republic and Ireland reported more such classroom disruptions, which means that these countries fall close to, or below, average levels of class discipline.*

What it means

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. Interruptions in the classroom disrupt students' concentration on, and their engagement in, their lessons.

Findings

On average across OECD countries, the percentage of students who reported that their teacher never or almost never has to wait a long time for them to quieten down increased by six percentage points – up to 73% in 2009 from 67% in 2000. Some 25 countries saw similar improvements, and in the remaining 13 countries with comparable data there was no change.

The change in this proportion was particularly large – more than 10 percentage points – in Germany, Israel, Italy, Spain, Sweden, the partner economy Hong Kong, China and the partner country Indonesia. The largest improvements occurred mostly among those countries whose students had reported worse conditions in 2000, such as Italy and Indonesia.

PISA results show that, on average across OECD countries, the proportion of students who responded "never" or "almost never" to the statement, "students don't listen to what the teacher says", fell by three percentage points from 2000 to 2009, but these proportions remain high: 75% in 2000 and 72% in 2009. In 18 countries, fewer students disagreed that "students don't listen to what the teacher says" in most or all lessons, signalling a worsening disciplinary climate. This proportion decreased by more than ten percentage points in Australia, the Czech Republic, Greece, Ireland, Poland and the partner country Liechtenstein. However, in ten countries, the share of students who did not agree with that statement grew. Korea and the partner economy Hong Kong, China showed increases of more than ten percentage points in this proportion, while the proportion grew between five and ten percentage points in Germany, Israel, Japan and the partner countries Peru and Romania.

Over the period, there was no change among OECD countries in the share of students who reported that there was noise and disorder. However, some of the countries where only one in two students reported noise and disorder occurring "never" or in "some lessons" showed large improvements: in 2000, between 51% and 54% of students in Chile, Greece and Italy reported that there was "never" or "almost never" noise and disorder in some lessons; by 2009, this proportion had increased to 63% in Chile, 58% in Greece and 68% in Italy.

At the same time, some countries showed worsening conditions: in Poland, Switzerland and the partner country Liechtenstein, this proportion decreased by seven to nine percentage points, although it remained at above-average levels. In Australia, the Czech Republic and Ireland, the share of students who reported that noise and disorder never occur, or only in some lessons, also decreased by seven to nine percentage points, but in these countries, this proportion is now close to or even below average.

Definitions

Students were asked to describe how often (never, in some, most or all lessons) interruptions occur in reading lessons. These disruptions include: students do not listen to what the teacher says, there is noise and disorder, the teacher has to wait a long time for students to quieten down, students cannot work well, and students do not start working for a long time after the lesson begins. Similar questions were asked in PISA 2000, so responses can be compared across time.

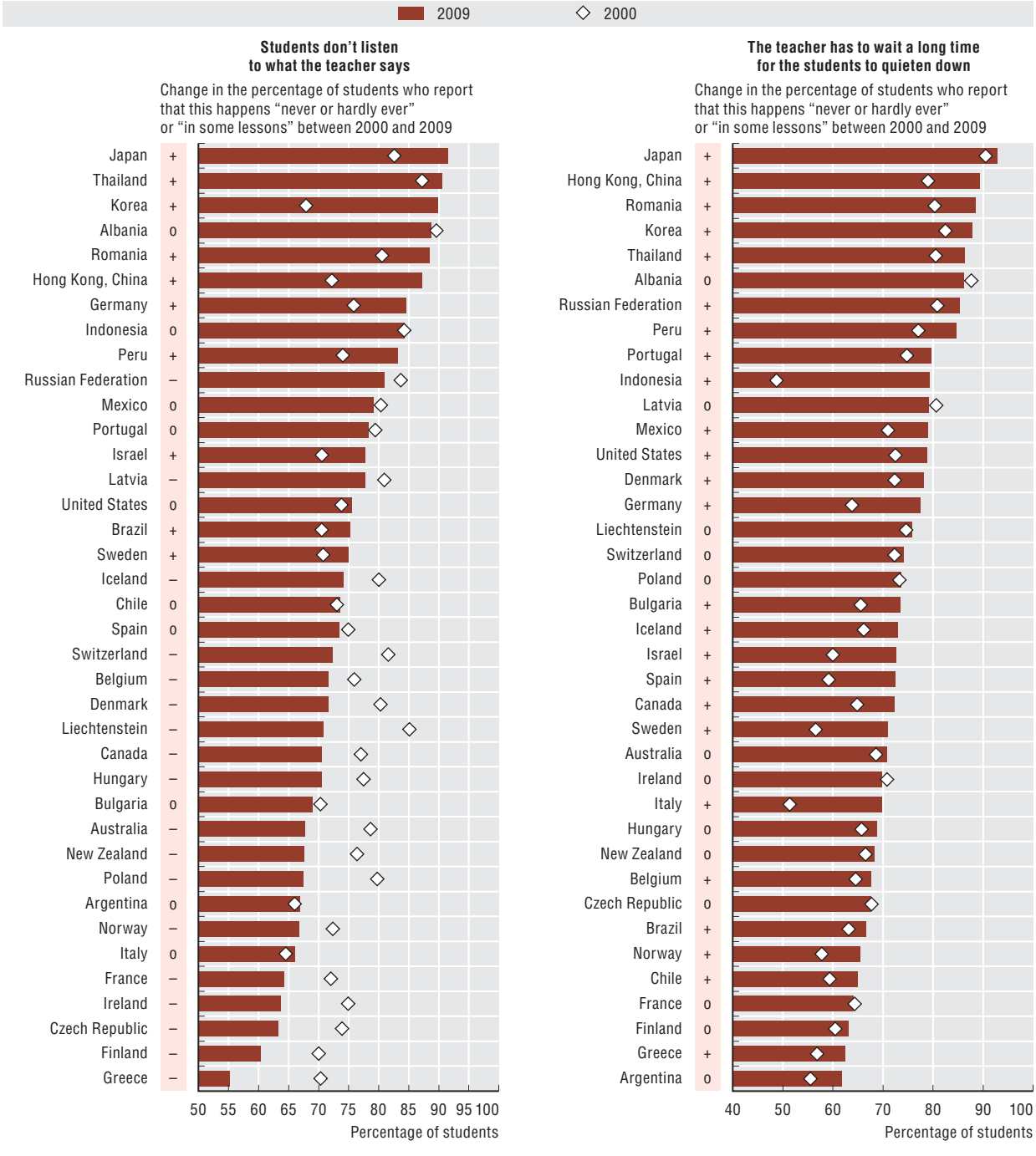
Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*

Going further

Further analysis of changes in disciplinary climate between 2000 and 2009 is presented in Chapter 5 of *PISA 2009 Results Volume V, Learning Trends: Changes in Student Performance Since 2000*. Full data are shown in Table V.5.12 at the back of that volume.

Figure 4.2. **Change in disciplinary climate between 2000 and 2009**

Percentage of students reporting that the following things happen "never or hardly ever" or "in some lessons"



	2009 higher than 2000	2009 lower than 2000	No statistically significant difference
95% confidence level	+	–	o

Note: Countries are ranked in descending order of the percentage of students on the items in 2009.

Source: OECD (2010), *PISA 2009 Results, Volume V, Learning Trends: Changes in Student Performance Since 2000*, Figure V.5.12, available at *http://dx.doi.org/10.1787/888932360024*.

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PISA 2009 at a Glance

PISA 2009 at a Glance is a companion publication to *PISA 2009 Results*, the six-volume report on the 2009 survey conducted by the OECD's Programme for International Student Assessment (PISA). PISA assesses the extent to which students near the end of compulsory education have acquired some of the knowledge and skills that are essential for full participation in modern societies. Its triennial assessments of 15-year-olds focus on reading, mathematics and science.

PISA 2009 at a Glance provides easily accessible data on some of the main issues analysed in the full report:

- What students know and can do: How do students compare in the knowledge and skills they show at school? Which countries are the best performers? Which perform poorly?
- Overcoming social background: Does a student's socio-economic background affect his or her performance in school?
- Learning to learn: Are there some types of reading, and some ways of learning, that are better for students than others?
- What makes a school successful?: What traits do high-performing schools have in common?

Each issue is presented on a two-page spread. The left-hand page explains what the issue means both for students and for participating countries and economies, discusses the main findings and provides readers with a roadmap for finding out more in other OECD publications and databases. The right-hand page contains clearly presented charts and tables, accompanied by dynamic hyperlinks (*StatLinks*) that direct readers to the corresponding data in Excel® format.

PISA 2009 at a Glance is an ideal introduction to PISA and to the OECD's rich trove of internationally comparable data on education and learning.

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