



2

Trends in Reading

This chapter highlights trends in reading performance between 2000 and 2009. It includes changes in performance among the lowest- and highest-achieving students, boys and girls, students with an immigrant background, socio-economically advantaged and disadvantaged students, and among countries.



CONTINUITY AND CHANGE IN THE READING LITERACY FRAMEWORK AND ASSESSMENT

Reading literacy includes a broad set of cognitive competencies, from basic decoding, through knowledge of words, grammar and linguistic and textual structures and features, to knowledge about the world. It also includes metacognitive competencies: the awareness of and ability to use a variety of appropriate strategies when processing texts. Specifically, PISA defines *reading literacy* as understanding, using and reflecting on written texts in order to achieve one's goals, acquire knowledge, develop one's potential and participate in society (OECD, 2006b). A more detailed description of the conceptual framework underlying the PISA reading assessment is provided in Volume I of this report, *What Students Know and Can Do*.

The framework and instruments for measuring reading literacy were developed for the PISA 2000 assessment. The PISA 2000 mean score for reading for 28 OECD countries was set at 500 and the standard deviation was set at 100, establishing the scale against which reading performance in PISA 2009 was compared. Two countries that participated in PISA 2000 have joined the OECD since 2000, while results for four OECD countries were excluded from comparisons over time. Thus, reading performance trends are discussed for the 26 OECD countries that participated in and had comparable results from both the 2000 and 2009 assessments. The PISA 2000 OECD average for these 26 OECD countries is now 496, while the reading performance scale remained unchanged.¹ In PISA 2003 and PISA 2006, when the focus shifted first to mathematics and then to science, reading was allocated smaller amounts of assessment time than in 2000, allowing only for an update on overall performance rather than the kind of in-depth analysis of knowledge and skills that was possible for the PISA 2000 and 2009 assessments. To ensure comparability across successive reading assessments, 41 out of the 130 PISA reading items used in the 2009 assessment were taken from the PISA 2000 assessment. These items were selected to reflect the overall balance of the framework so that the proportion of items contained in each type of task was similar. From the 41 items assessed in both 2000 and 2009, 28 reading items were also used in PISA 2003 and 2006 to assure the comparability of results for these assessments. Details of the equating methodology for reading performance trends are provided in Annex A1.

The scale on which student performance is reported is thus the same as the one used in 2000. It can be compared across all four cycles. Consequently, the proficiency levels are also the same, although in 2009 the reading scale was extended with new proficiency levels, at both the top and bottom ends of the performance distribution, to reflect the capacity of PISA 2009 to provide more detailed information about low- and high-performing students.

HOW STUDENT PERFORMANCE IN READING HAS CHANGED SINCE 2000

The OECD's average reading performance has remained similar since 2000, in relation to the 26 OECD countries that had comparable results both in the 2000 and 2009 assessments. This, in itself, is noteworthy because in recent years, most countries have increased their investment in education substantially. Between 1995 and 2007, expenditure per primary and secondary student increased by 43% in real terms, on average, across OECD countries (OECD, 2010b, Table B1.5). In the short period between 2000, when the first PISA assessment was undertaken, and 2007, increases in expenditures on education averaged around 25%; eight OECD countries increased their expenditures by between 35% and 71%. While not all these expenditures were devoted to raising the performance of students assessed in PISA, it is intriguing that in many countries, such major financial efforts have not yet translated into improvements in performance.

However, some countries have seen marked improvements in learning outcomes. Among the 38 countries that can be compared between 2000 and 2009, 13 have seen improvements in reading performance since 2000 (Figure V.2.1, see also Table V.2.1). Of the 26 OECD countries with comparable results for both assessments, seven countries have seen improvements: Chile, Israel and Poland all improved their reading performance by more than 20 score points, and Portugal, Korea, Hungary and Germany by between 10 and 20 score points. Similarly, among the partner countries, Peru, Albania, Indonesia and Latvia improved their performance by more than 20 score points, and Liechtenstein and Brazil by between 10 and 20 score points.

Four countries saw a decline in their reading performance between 2000 and 2009. Among those, student performance in Ireland decreased by 31 score points, in Sweden by 19 score points, and in Australia and the Czech Republic by 13 score points.

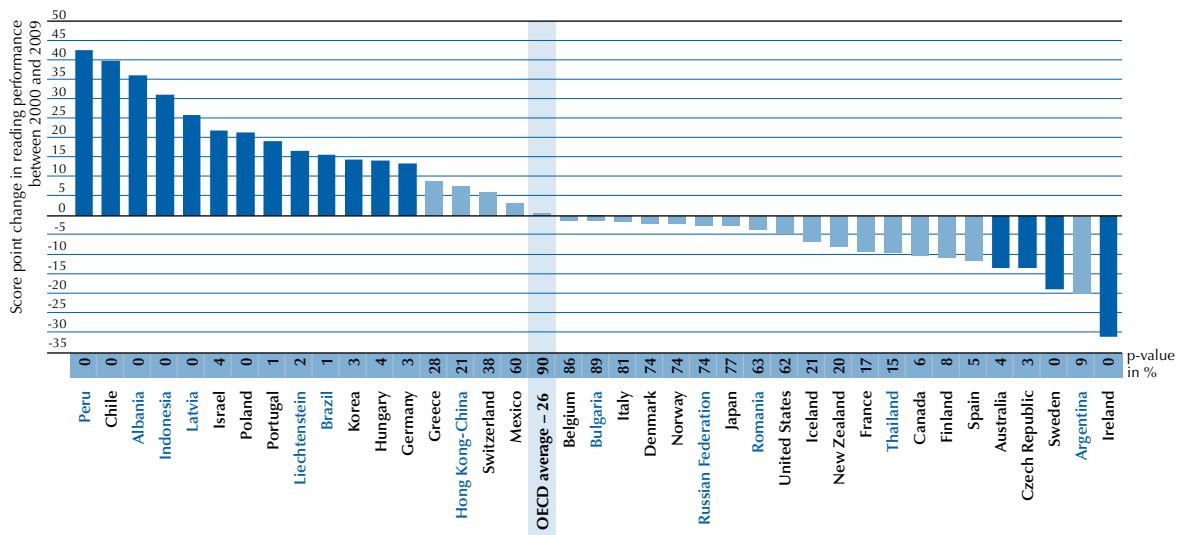
PISA considers only those results as statistically significant, marking them as such, where the uncertainty in measuring changes in performance implies that an increase or decrease would be identified in less than five out



of 100 replications of PISA when, in fact, there is no change. It is possible to calculate the exact percentage of replications in which a change would be reported when there is no real change. This so-called “p-value” is reported in Figure V.2.1 (see also the last column in Table V.2.1). The smaller this percentage, the more confidence one can have that the observed changes are real. The p-value allows readers to assess the reliability of observed performance differences that are not identified as statistically significant by PISA, using the stringent criteria described above. For example, the observed increase in performance is nine score points in Greece and eight score points in Hong Kong-China. This is a sizeable magnitude but the p-values for these estimates suggest that, in 28 out of 100 replications in the case of Greece and in 21 out of 100 replications in the case of Hong Kong-China, PISA could have identified such a change even if there is, in fact, no change. Because of the magnitude of the potential error, PISA does not identify these changes as statistically significant. However, readers who are satisfied with a lower level of confidence can still take these values into consideration.

■ Figure V.2.1 ■

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, PISA 2009 Database, Table V.2.1.

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Countries differ in their absolute performance levels, so even with improvements in reading performance, some countries still perform far below the OECD average, while some countries with a decline in reading performance may still outperform many other countries. It is thus useful to examine both where countries stand and how performance has changed.

Countries towards the right of Figure V.2.2 improved their performance between 2000 and 2009, while those towards the left saw a decrease in student scores. Countries towards the top performed above the OECD average in 2009, while those towards the bottom performed below the OECD average. Countries that improved their performance between 2000 and 2009 can be classified into three groups, depending on their performance level in 2009. The first group includes countries that improved their performance but still performed below the OECD average. These countries are represented in the bottom-right corner of Figure V.2.2. The second group includes countries that improved their performance so that they now perform close to the OECD average. These countries are represented in the middle-right of Figure V.2.2. The third group contains countries that had already outperformed most of the PISA participants but still improved their performance. These countries are on the top-right part of Figure V.2.2. For countries with a white marker the changes were not statistically significant.

Among countries that scored above the OECD average in 2009, three countries improved their performance. Korea improved its performance by 15 score points from an already high level in 2000. Poland improved its performance by 21 score points and, from a country that performed below the OECD average in 2000, became a country that

scored above the OECD average in 2009. The partner country Liechtenstein improved its performance by 17 score points. More detailed discussions of the school systems in Korea and Poland are provided in Boxes V.B and V.C, respectively, which appear between Chapters 1 and 2.

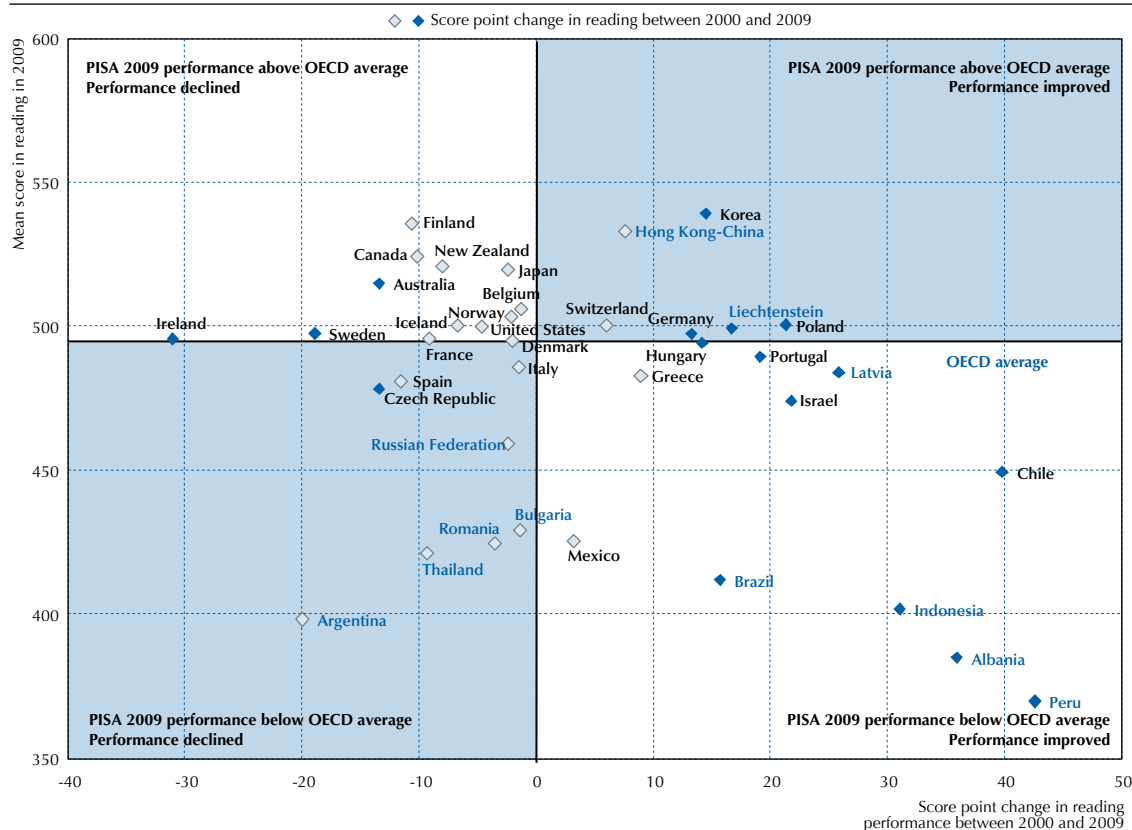
Among average-performing countries in 2009, reading performance improved in Portugal, Hungary and Germany. Box V.D, which appears between Chapters 3 and 4, provides more details on reforms in Portugal.

Several countries with below-average performance in 2009 saw marked improvements. Among OECD countries, student performance in Chile increased by 40 score points and is now close to 450 score points, while student performance in Israel increased by 22 score points and is now equal to 474 score points. Chile's school system is briefly discussed in Box V.F, which appears after Chapter 4. The partner country Peru saw the largest improvement, with an increase of 43 score points, although its overall performance is still below 400 score points. Albania and Indonesia increased their performance by 30 to 40 score points, although both countries still perform at or below 400 score points. Brazil increased its performance by 16 score points and now performs above 400 score points (see Box V.G, which appears after Chapter 5). Latvia increased its performance by 26 score points and now performs at 484 score points.

A number of countries performing above the average saw a decrease in reading scores. Australia's performance declined by 13 score points but the country still ranks among the top performers in reading. Performance in Ireland and Sweden declined by 31 and 19 score points, respectively, and both countries now perform around the OECD average. The Czech Republic also saw a decline in performance and now scores below the OECD average.

■ Figure V.2.2 ■

How countries perform in reading and how reading performance has changed since 2000



Note: Score point change in reading performance between 2000 and 2009 that are statistically significant are marked in a darker tone.

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

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■ Figure V.2.3 ■

Multiple comparisons between 2000 and 2009

	Reading performance in 2000	Reading performance in 2009	Countries with lower performance in 2000 and similar performance in 2009	Countries with lower or similar performance in 2000 and higher performance in 2009	Countries with similar performance in 2000 and 2009	Countries with similar or higher performance in 2000 and lower performance in 2009	Countries with higher performance in 2000 and similar performance in 2009
Korea	525	539			Hong Kong-China	Japan, Canada, Ireland, New Zealand, Australia	Finland
Finland	546	536	Korea, Hong Kong-China				
Hong Kong-China	525	533			Korea	Japan, Canada, Ireland, New Zealand, Australia	Finland
Canada	534	524	Japan	Korea, Hong Kong-China	New Zealand	Australia	
New Zealand	529	521		Korea, Hong Kong-China	Japan, Canada, Australia	Ireland	
Japan	522	520		Korea, Hong Kong-China	New Zealand, Australia	Sweden, Ireland	Canada
Australia	528	515		Canada, Korea, Hong Kong-China	Japan, New Zealand	Ireland	
Belgium	507	506	Liechtenstein, Switzerland, Poland		Norway, United States	Iceland, Sweden, Ireland, France	
Norway	505	503	Liechtenstein, Germany, Switzerland, Poland		Iceland, Belgium, United States, France		Sweden, Ireland
Switzerland	494	501	Liechtenstein, Germany, Poland, Hungary		Denmark, United States	Italy, Spain, Czech Republic	Iceland, Norway, Belgium, Sweden, Ireland, France
Poland	479	500			Liechtenstein, Germany, Hungary	Italy, Portugal, Spain, Greece, Czech Republic	Iceland, Norway, Switzerland, Belgium, Denmark, Sweden, Ireland, United States, France
Iceland	507	500	Liechtenstein, Germany, Switzerland, Poland, Hungary	Belgium	Norway, United States, France		Sweden, Ireland
United States	504	500	Liechtenstein, Germany, Poland, Hungary		Iceland, Norway, Switzerland, Belgium, Denmark, Sweden, France	Spain, Czech Republic	Ireland
Liechtenstein	483	499			Germany, Poland, Hungary	Italy, Spain, Greece, Czech Republic	Iceland, Norway, Switzerland, Belgium, Denmark, Sweden, Ireland, United States, France
Sweden	516	497	Iceland, Norway, Liechtenstein, Germany, Switzerland, Denmark, Poland, Portugal, Hungary, France	Japan, Belgium	United States		Ireland
Germany	484	497			Liechtenstein, Poland, Hungary	Italy, Spain, Greece, Czech Republic	Iceland, Norway, Switzerland, Denmark, Sweden, Ireland, United States, France
Ireland	527	496	Iceland, Norway, Liechtenstein, Germany, Switzerland, Denmark, Sweden, Poland, Portugal, Hungary, United States, France	Japan, Belgium, Korea, Hong Kong-China, New Zealand, Australia			
France	505	496	Liechtenstein, Germany, Switzerland, Denmark, Poland, Portugal, Hungary	Belgium	Iceland, Norway, United States		Sweden, Ireland
Denmark	497	495	Liechtenstein, Germany, Poland, Portugal, Hungary		Switzerland, United States	Spain, Czech Republic	Sweden, Ireland, France
Hungary	480	494			Liechtenstein, Germany, Poland, Portugal	Italy, Spain, Greece, Czech Republic	Iceland, Switzerland, Denmark, Sweden, Ireland, United States, France
Portugal	470	489		Poland	Latvia, Greece, Hungary	Russian Federation, Israel, Spain, Czech Republic	Italy, Denmark, Sweden, Ireland, France
Italy	487	486	Latvia, Portugal, Greece	Liechtenstein, Germany, Switzerland, Poland, Hungary	Spain	Czech Republic	
Latvia	458	484			Portugal	Russian Federation, Israel	Italy, Spain, Greece, Czech Republic
Greece	474	483	Latvia, Israel	Liechtenstein, Germany, Poland, Hungary	Portugal	Russian Federation	Italy, Spain, Czech Republic
Spain	493	481	Latvia, Israel, Greece	Liechtenstein, Germany, Switzerland, Denmark, Poland, Portugal, Hungary, United States	Italy, Czech Republic		
Czech Republic	492	478	Latvia, Israel, Greece	Italy, Liechtenstein, Germany, Switzerland, Denmark, Poland, Portugal, Hungary, United States	Spain		
Israel	452	474		Latvia, Portugal		Russian Federation	Spain, Greece, Czech Republic
Russian Federation	462	459		Latvia, Israel, Portugal, Greece			
Chile	410	449				Argentina, Thailand, Bulgaria, Romania, Mexico	
Bulgaria	430	429		Chile	Thailand, Romania, Mexico	Argentina	
Mexico	422	425		Chile	Thailand, Bulgaria, Romania	Argentina	
Romania	428	424		Chile	Thailand, Bulgaria, Mexico	Argentina	
Thailand	431	421		Chile	Bulgaria, Romania, Mexico	Argentina	
Brazil	396	412				Argentina	
Indonesia	371	402					Argentina
Argentina	418	398	Indonesia	Thailand, Bulgaria, Romania, Brazil, Mexico, Chile			
Albania	349	385					
Peru	327	370					

Source: OECD, PISA 2009 Database.


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Figure V.2.3. provides multiple comparisons of changes in the relative standing of countries in reading performance in 2000 and 2009. Countries are sorted by their performance in 2009. For each country the figure identifies a list of other countries or economies with similar performance. The first group includes comparisons between countries that had lower scores in 2000 but have similar performance levels in 2009 as the country shown in the first column. The second group includes countries with lower or similar scores in 2000 but that show higher scores in 2009. The third group includes countries whose performance was similar in 2000 and 2009. The fourth group includes countries with similar or higher scores in 2000 and lower scores in 2009. The fifth group includes countries with higher scores in 2000 and similar scores in 2009. The figure includes all 38 countries that have comparable results from the 2000 and 2009 assessments.

The chart can be used to see how the position of a country changed compared to other countries that are close in relative performance.

Mean performance summarises overall student performance in PISA. While it gives a general idea of how countries perform in comparison to others, mean performance can mask important variations in student performance. For policy makers, information about the variability of student performance is important. For example, readers interested in policies and practices relating to the most talented students might be interested in those countries in which the highest-achieving students improved their performance, or countries in which the share of high-achieving students grew. Similarly, readers interested in policies and practices relating to lower-performing students might examine more closely those countries that have seen improvements among the lowest-achieving students, or where the share of low-achieving students decreased.

Performance trends among low- and high-achieving students can be examined by considering changes in the percentage of students at each of the PISA proficiency levels. As explained in Volume I, *What Students Know and Can Do*, reading scores in 2009 are reported according to different levels of proficiency that correspond to tasks of varying difficulty. Establishing proficiency levels in reading makes it possible not only to rank students' performance but also to describe what students at different levels of the reading scale can do.

As explained in Volume I, reading proficiency Level 2 can be considered a baseline level of proficiency, at which students have learned to read and begin to demonstrate the kind of competencies that are required to use reading for learning. Students below this level may still be capable of locating pieces of explicitly stated information that are prominent in the text, recognising a main idea in a text about a familiar topic, or recognising the connection between information in the text and their everyday experience. However, they have not acquired the level of literacy that is required to participate effectively and productively in life. On average across the 26 OECD countries with comparable results for both assessments, 18.1% of students performed below Level 2 in 2009, while the corresponding percentage in 2000 was 19.3% (Table V.2.2). Although this percentage changed only slightly between the two assessments, it varied noticeably among countries.

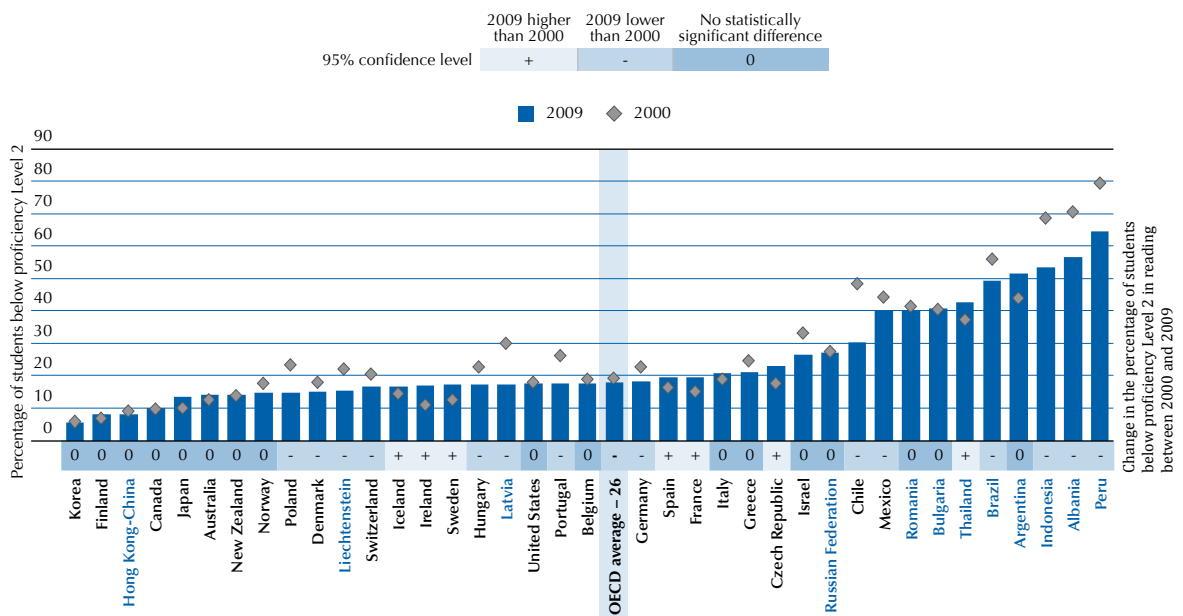
Reducing the percentage of poorly performing students is considered one of the most important tasks for school systems in many countries, given the large economic and social costs associated with poor performance in school. Following up on students who were assessed in PISA 2000, the Canadian Youth in Transitions Survey shows that students scoring below Level 2 face a disproportionately higher risk of poor participation in post-secondary education or low labour-market outcomes at age 19, and even worse outcomes at age 21, the latest age for which these data are available (OECD, 2010a).

Figure V.2.4 shows changes in the share of students below Level 2. For each country, bars represent the percentage of students performing below Level 2 in 2009, while markers denote that share in 2000. Countries are sorted according to the percentage of students below Level 2 in 2009, with those that show fewer students at this low proficiency level are on the left.

To make comparisons of changes in the percentage of students at different proficiency levels more meaningful, countries can be grouped according to how many students in those countries performed at each level in 2000. In 2000, more than 60% of students in Peru, Albania and Indonesia performed below Level 2 (Table V.2.2). All three countries have seen a reduction in this share of more than 10 percentage points. The proportion of lower-performing students remained at relatively high levels in these countries, but this trend shows that real progress has been made in all the PISA countries where the very highest percentages of 15-year-olds have limited reading skills.



■ Figure V.2.4 ■
Percentage of students below proficiency Level 2 in reading in 2000 and 2009



Countries are ranked in ascending order of the percentage of students below proficiency Level 2 in reading in 2009.
 Source: OECD, PISA 2009 Database, Table V.2.2.

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Among countries where between 40% and 60% of students performed below Level 2 in 2000, in Chile that proportion decreased by 18 percentage points (see Box V.F), while the proportion decreased by smaller amounts in Mexico and the partner country Brazil (see Box V.G).

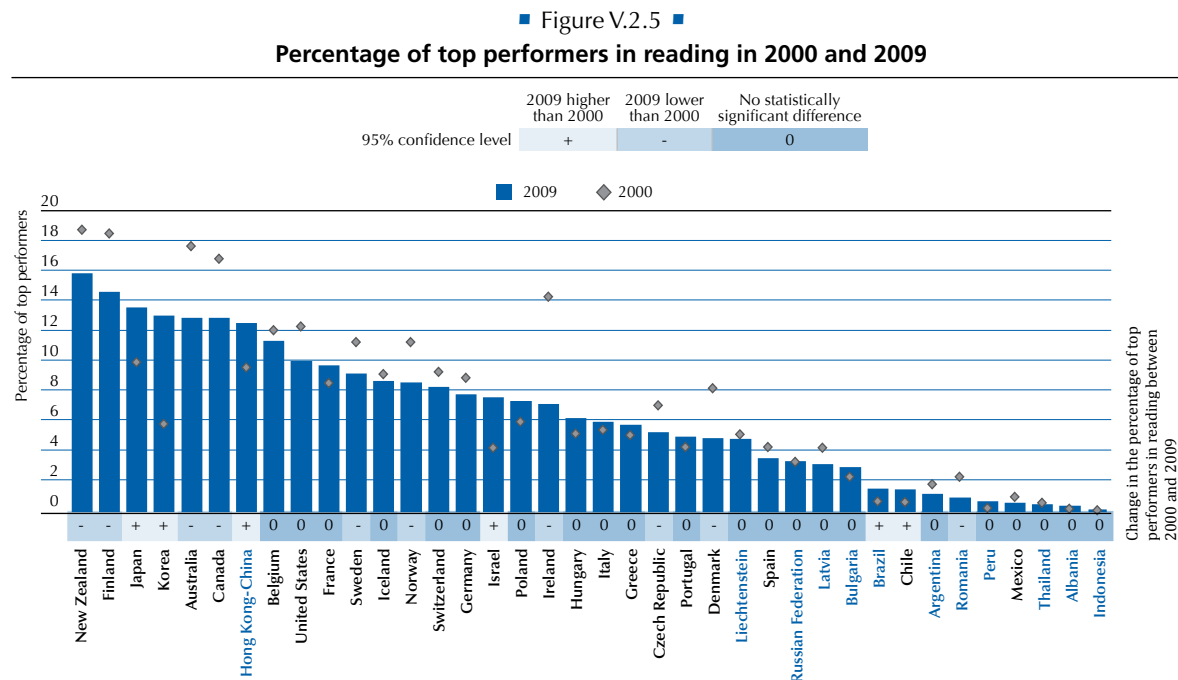
Among countries where the proportion of students performing below Level 2 was smaller than 40% but still above the OECD average of 19%, the partner country Latvia reduced the proportion by 13%, while Portugal, Poland, Hungary, Germany, Switzerland, and the partner country Liechtenstein reduced it by smaller amounts (see Boxes V.D for Portugal and V.C for Poland for examples of policies that might be associated with these trends). In the partner country Thailand, the proportion of students performing below Level 2 increased by six percentage points from a relatively high level of 37%. In countries where the proportion of students performing below Level 2 was already below average in 2000, Denmark further reduced the proportion by three percentage points and now shows 15% of students below Level 2.

The proportion of students below Level 2 increased in Ireland, the Czech Republic, Sweden, France, Spain and Iceland. While this proportion is still below the OECD average in Iceland, Ireland and Sweden, it is now above average in France, Spain and the Czech Republic.

Students performing at Level 5 or 6 are frequently referred to as “top performers” in this report. These students can handle texts that are unfamiliar in either form or content. They can find information in such texts, demonstrate detailed understanding, and infer which information is relevant to the task. Using such texts, they are also able to evaluate critically and to build hypotheses, draw on specialised knowledge and accommodate concepts that may be contrary to expectations. A comparison of the kinds of tasks students at Level 5 or above are capable of suggests that those who get to this level can be regarded as potential “world class” knowledge workers of tomorrow. Thus, the proportion of a country’s students reaching this level is a good indicator of its future economic competitiveness.

On average across the 26 OECD countries with comparable results for both assessments, the combined percentage of students performing at Level 5 or 6 was 9.0% in 2000 and decreased to 8.2% in 2009 (see Table V.2.2). Although the proportion of students at this level changed only slightly between the assessments, it varies considerably across countries.

Figure V.2.5 shows changes in the shares of top-performing students. For each country, blue bars represent the percentage of students performing at Level 5 or 6 in 2009, while markers denote the corresponding proportion in 2000. Countries are sorted according to the percentage of students at Level 5 or above in 2009, with countries that have the largest proportion of top performers on the left.



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

Source: OECD, PISA 2009 Database, Table V.2.2.

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The proportion of top performers increased in Japan and Korea and the partner economy Hong Kong-China to one of the highest levels among 2009 participants (Table V.2.2). In Japan, this proportion increased from nearly 10% to above 13%. In Korea, it increased by more than seven percentage points from less than 6% to almost 13%, which was the highest observed change among participating countries. Because of this improvement, Korea moved from below to above the OECD average in the percentage of top performers (see also Box V.B). In Hong Kong-China, this proportion increased by almost three percentage points to slightly more than 12%. Among countries that have relatively low proportions of top performers, the percentage of students at Level 5 or above increased by three percentage points in Israel, and by less than one percentage point in Chile and the partner country Brazil.

In several countries that had above-average proportions of top performers in 2000, this percentage decreased. The most noticeable change was in Ireland, where the proportion of top performers decreased from 14% to 7%, which is below the OECD-26 average. In Australia, Canada, Finland and New Zealand, the decrease was smaller and all these countries still have more top performers than the OECD average for the 26 countries that have comparable results from both assessments. This proportion decreased in Norway and Sweden from a similar level of 11% in 2000 to 9% in Sweden and 8% in Norway. The proportion of top performers decreased from 8% to less than 5% in Denmark and from 7% to 5% in the Czech Republic. Interestingly, in Denmark, the proportion of students below Level 2 also decreased. The partner country Romania is the only country where the proportion of top performers decreased from an already low level, from 2% to less than 1%.

While trends in proficiency levels compare the highest- and the lowest-performing students with an absolute measure, it is also possible to compare the top and bottom ends of the performance distribution relative to the average student *within* a country. This is particularly useful in countries with very low or high overall levels of student performance, in which international benchmarks for the highest- and the lowest-performing students may be less relevant. Such within-country comparisons can be facilitated by analysing the percentiles of the



student performance distribution within a country. Percentiles do not indicate what students can do; they provide quantitative information on the performance of the lowest- or the highest-achieving students relative to other students in a country.

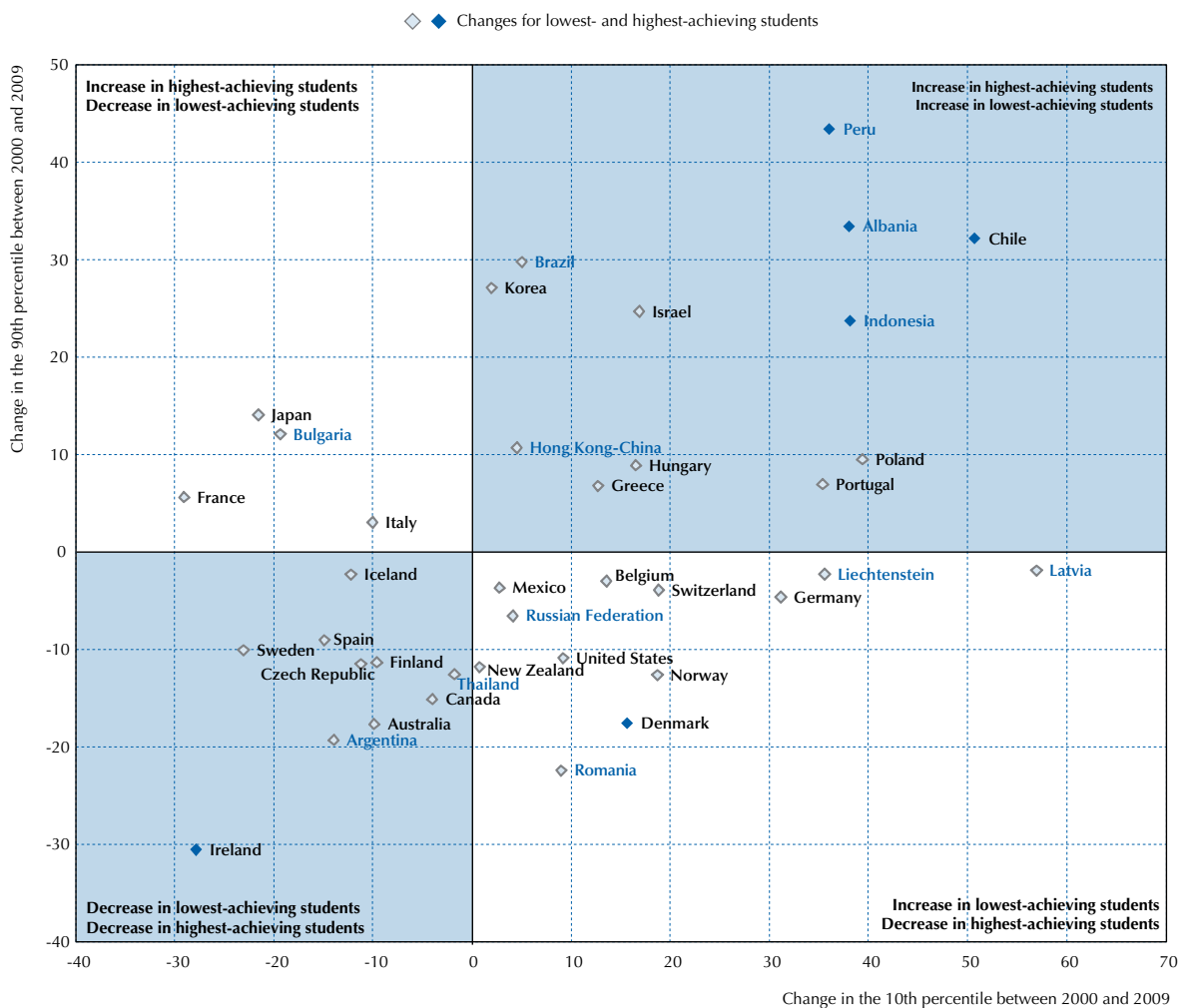
The 90th percentile indicates the point on the PISA performance scale below which 90% of students in a country score or which only 10% of students exceed. Changes in the value of the 90th percentile show whether a country saw an increase or decrease in the performance level of its highest-performing students. Similarly, the 10th percentile indicates the point on the PISA performance scale below which only 10% of students in a country score. A change in the value of the 10th percentile indicates whether a country sees an increase or decrease in the performance level of its lowest-performing students.

The difference between the 90th and 10th percentiles can be used as a measure of the range of performance in each country. Trends in this difference show whether the variation in student performance within the country is changing.

Performance at key percentile ranks can change even if a country's mean performance remains the same.

Figure V.2.6 classifies countries into four groups (see also Table V.2.3). Countries in the top-right corner show improved performance among both their highest- and lowest-achieving students, while countries in the bottom-

■ Figure V.2.6 ■
Performance changes among the lowest- and highest-achieving students in reading between 2000 and 2009



Note: Changes for both lowest- and highest-achieving students that are statistically significant are marked in darker tone.

Source: OECD, PISA 2009 Database, Table V.2.3.

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left corner show a decline in performance among both groups of students. Countries in the top-left corner show improvements in performance among their highest-achieving students and a decline in the performance of their lowest-achieving students. In these countries, variation in performance increased because of the widening gap between the top and the bottom levels of student performance. Countries in the bottom-right corner show an improvement in performance among their lowest-achieving students and a decline among their highest-achieving students. In these countries, the variation in performance diminished. Most of the countries, however, are situated in the top-right or bottom-left corners, indicating that performance trends among their lowest- and highest-achieving students in these countries are similar. Countries indicated with blue markers showed statistically significant changes in the performance of both their highest- and lowest-achieving students. Countries indicated with white markers did not see statistically significant changes or saw them for either the highest- or the lowest-achieving students, but not for both.

Chile and three partner countries, Indonesia, Albania and Peru, all show marked improvements in reading performance among both their lowest- and highest-achieving students. These countries are also among those that show the largest improvement in mean performance and in which the percentage of students performing below Level 2 decreased. The lowest-achieving students show relatively larger improvements than the highest-achieving students in Chile and Indonesia, while in Peru and Albania both groups of students show similar levels of improvement. In short, in these countries, students across the entire performance scale improved.

Six countries – Poland, Portugal, Germany, Switzerland, and the partner countries Latvia and Liechtenstein – saw improvements in the performance of their lowest-achieving students while maintaining the performance level among the highest-achieving students.

Korea, Israel, and the partner country Brazil raised the performance of their highest-achieving students while maintaining the performance level among the lowest-achieving students.

In Denmark, the performance of the lowest-achieving students improved, while the performance of the highest-achieving students declined. Similarly, in Norway, the performance of the lowest-achieving students improved and the share of top performers decreased. As a consequence, the performance gap between the lowest- and the highest-achieving students narrowed markedly in these two countries, while their mean performance did not change.

In Australia and Canada, and the partner country Romania, performance among their highest-achieving students declined while performance among their lowest-achieving students remained largely unchanged.

In France, the performance of the lowest-achieving students declined while the performance of the highest-achieving students remained the same.

In Ireland and to some extent in Sweden, the performance of both the lowest- and highest-achieving students declined. These countries are also among those that show the greatest decrease in mean performance results and are among those in which the percentage of students at the highest proficiency levels fell while the percentage of those below Level 2 rose.

For the rest of the countries, performance among the lowest- and the highest-achieving students did not change measurably.

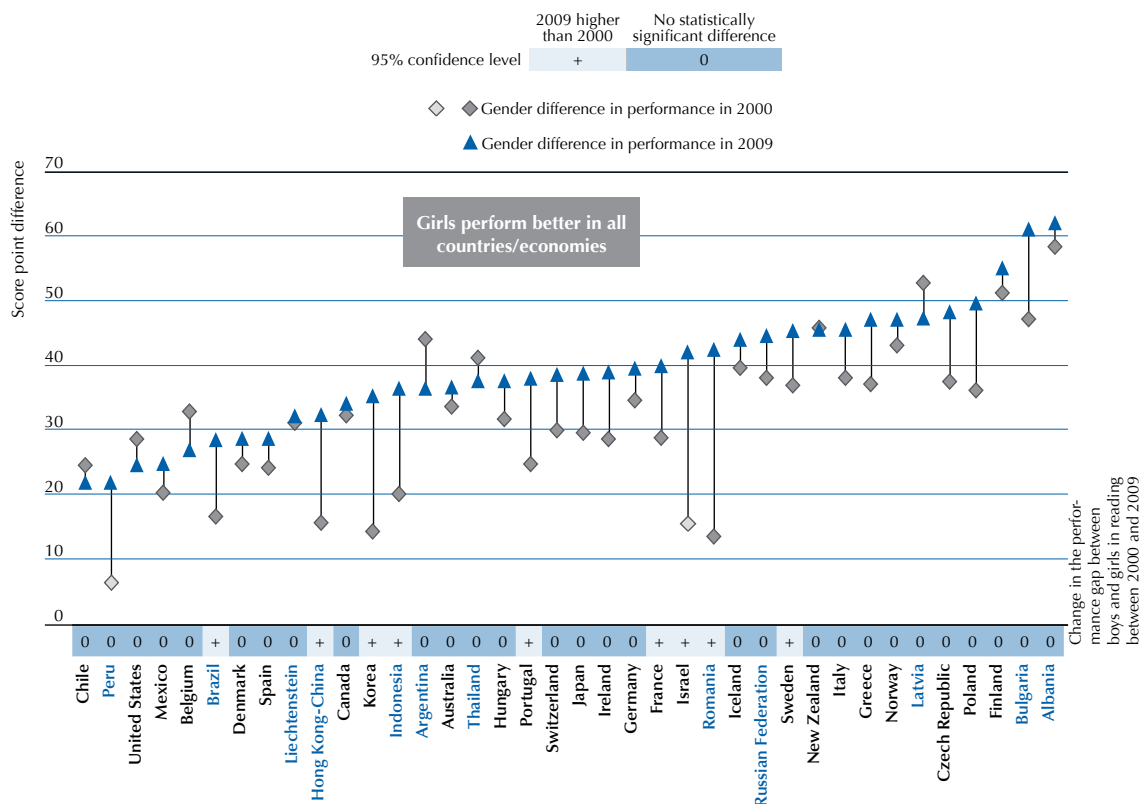
HOW GENDER DIFFERENCES IN READING HAVE EVOLVED

The gender gap is far wider in reading than it is in either mathematics or science, and this has been true since the first PISA assessment in 2000. Girls outperform boys in reading in all countries participating in 2009, with an average advantage of 39 score points across OECD countries (see Table V.2.4). In 2000, the corresponding gender gap was 32 score points, on average, across OECD countries.

The gender gap widened in some countries, but it did not narrow in any country. It increased by more than 20 score points in Israel and Korea and the partner country Romania. In all of these countries, the score point difference between boys and girls at least doubled. In Israel and Korea, the gap widened because of a marked improvement in girls' performance that was not matched by a similar trend among boys (see Box V.B, which discusses changes in girls' performance in Korea). The performance advantage among girls also increased in Portugal, the partner economy, Hong Kong-China, and the partner countries, Indonesia and Brazil, where the overall positive trend was due, in part, to a greater improvement among girls in comparison with boys. The gender gap also widened in France and Sweden, mainly because of a decline in boys' performance.



■ Figure V.2.7 ■
Comparison of gender differences in reading between 2000 and 2009



Notes: 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, PISA Database 2009, Table V.2.4.

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None of the countries where the advantage of girls increased is among those with the widest gender gaps. However, after the changes in the relative performance of boys and girls in Romania and Israel, the gender gap has become wider in these countries than on average across OECD countries, while it had previously been narrower.

In general, girls' performance advantage in reading is most pronounced in the percentage of students who perform below Level 2 (Tables V.2.5 and V.2.6). Across OECD countries, 24% of boys perform below Level 2 compared to only 12% of girls. Policy makers in many countries are already concerned about the large percentage of boys who lack basic reading skills. Therefore, any increase in this share is worth noting.

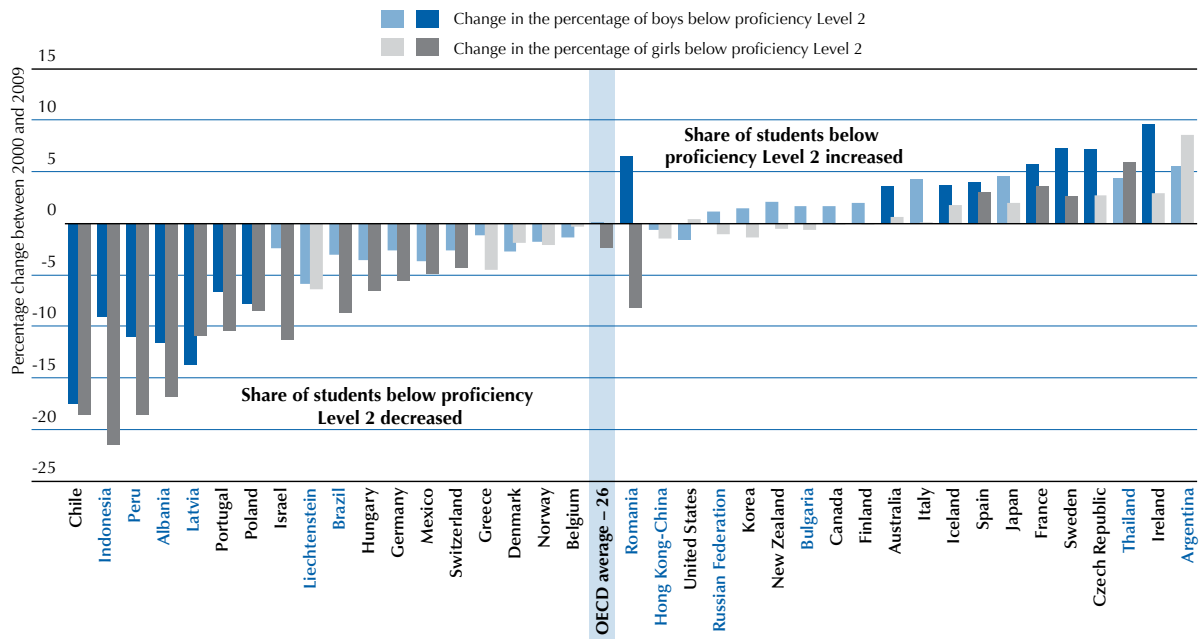
Figure V.2.8 shows changes in the percentages of boys and girls who perform below Level 2 in reading. Countries are sorted according to the overall trend among lower-performing students, with those where their numbers have fallen most shown on the left.

Across OECD countries, the percentage of girls performing below Level 2 decreased by two percentage points, while the share of lower-performing boys did not change.

In nearly all countries where there was a decrease in the percentage of students performing below Level 2, this trend was usually more apparent among girls. In Indonesia, the overall decrease in the percentage of students performing below Level 2 was around 15 percentage points; but while the percentage of girls performing below Level 2 decreased by 21 percentage points, the percentage of boys performing at that level decreased by only 9 percentage points. Similarly, in Peru and Albania, the share of girls performing below Level 2 decreased by 19 and 17 percentage points, respectively, whereas the corresponding share of boys decreased by 11 and 12 percentage points, respectively. In Israel and Brazil, the overall decrease in the share of students performing below Level 2

■ Figure V.2.8 ■

Change in the share of boys and girls who are low performers in reading between 2000 and 2009



Note: Changes in the share of students below proficiency Level 2 that are statistically significant are marked in a darker tone.

Countries are ranked in ascending order of change in the percentage of all students below Level 2 on the reading scale between 2000 and 2009.
Source: OECD, PISA 2009 Database, Table V.2.2, Table V.2.5 and Table V.2.6.

StatLink <http://dx.doi.org/10.1787/888932359967>

was also mainly the result of improvements among girls, with 11 and 9 percentage points fewer girls, respectively, performing below Level 2. The decrease in the percentage of boys performing below Level 2 in these countries was more modest, at two and three percentage points, respectively.

In Chile and Poland, the percentage of boys and girls below Level 2 decreased by about the same amount.

In another set of countries, the percentage of students below Level 2 has risen. In Sweden, France and Spain, this increase has occurred for both boys and girls although it has been greater for boys. In Ireland, the Czech Republic and Iceland, only the percentage of boys with a reading proficiency below Level 2 has risen. In Thailand, on the other hand, it has risen slightly for girls but not for boys.

In most countries, changes in the percentage of top-performing students, those at reading proficiency Level 5 or 6, are quite similar among boys and girls, but in a few countries they differ noticeably (Tables V.2.5 and V.2.6). For example, while in Denmark and Romania the decrease in the percentage of top performers was almost identical among boys and girls, it differed in magnitude in Finland, Australia, Canada and Ireland. In New Zealand, only the percentage of top performers among girls decreased significantly, while in the Czech Republic and Germany, only the percentage of top performers among boys decreased significantly.

Although the percentage of top performers increased in Japan and Korea and the partner economy Hong Kong-China to similarly high levels, the increase was very different among boys and girls. In Korea, the increase was the largest when looking at all students, but also when looking separately at boys and girls. Nonetheless, the percentage of top performers increased among girls by more than nine percentage points and among boys by slightly less than five percentage points. In Hong Kong-China, the percentage of top performers among girls increased by more than six percentage points, while it did not change among boys. Similarly, in Japan, this proportion increased by almost five percentage points among girls, more than among boys. Effectively, the gap in the proportion of top performers among boys and girls widened in these countries.



CHANGES IN PERFORMANCE AND CHANGES IN STUDENT POPULATIONS

The PISA assessments continue to evolve, to capture newly emerging knowledge and skills as the learning goals and instructional practices of countries change, reflecting methodological advances. At the same time, PISA implements high technical standards and coherence in methodologies across successive assessments, ensuring that performance can be monitored reliably over time and that the samples of students are representative of the same populations.

However, in many countries the demographic and socio-economic context of student populations has changed. Thus, observed changes in learning outcomes may not only reflect changes in the quality of the educational services provided for 15-year-olds, but also changes in the composition of the student populations. For example, if migration into a country has been significant over the past ten years, it might influence learning outcomes. Similarly, if the student population has become more socio-economically diverse, then this too can influence outcomes.

This section discusses how trends are affected by changes in student populations. It also provides an overall trend line that summarises information across all PISA assessments. Annex A6 provides details on methods used in this section. It also discusses any impact that technical changes in the national samples of students may have on the comparability of student performance over time.

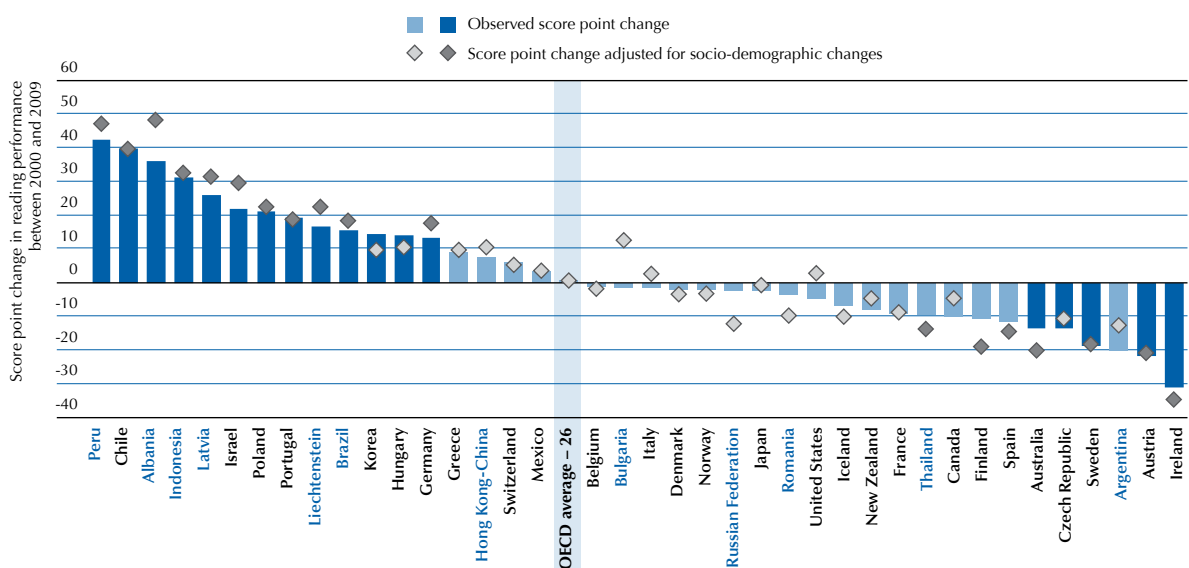
THE IMPACT OF CHANGES IN THE SOCIO-ECONOMIC COMPOSITION OF STUDENT POPULATIONS ON TRENDS IN READING PERFORMANCE

In the following section, changes in the age and gender composition of students, the socio-economic background of student populations, changes in the share of students who always or almost always speak the language of the assessment at home, and changes in the share of students with foreign-born parents are accounted for when interpreting changes in student performance. The corresponding demographic data for 2000 and 2009 are presented in Annex A6 where the adjustment method is also explained in detail. The data on changes in socio-economic background are provided in Table V.4.2.

Figure V.2.9 shows both the observed change in student performance and the predicted performance change if the composition of the student population in 2000 had been similar to the one in 2009, that is, if the student population in 2000 had the same age and gender composition, the same socio-economic background and the same share of

■ Figure V.2.9 ■

Changes in reading performance between 2000 and 2009



Note: Observed score point changes that are statistically significant are marked in a darker tone. Countries are ranked in descending order of the observed score point change between 2000 and 2009. Source: OECD, PISA 2009 Database, Table V.2.7.

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students with an immigrant background as in 2009 (see also Table V.2.7). The observed change is represented by bars, while the predicted change adjusted for changes in the composition of the student body is denoted by markers. Countries are sorted by the observed change in reading performance.

Among countries that showed improvements in reading performance, changes in the demographic and socio-economic composition of student populations had the largest impact in Israel and the partner country Albania, where the improvement in student performance would have been seven and 12 score points larger, respectively, if the demographic and socio-economic context had been similar in 2000 and 2009 (see Tables V.2.1 and V.2.7).² In Germany and the partner countries Liechtenstein, Latvia and Peru, the adjusted performance improvement was larger by around five score points. In these countries, student performance would have increased more rapidly than the performance increase that was actually observed if the changes in the demographic and socio-economic composition of the student population had been accounted for. This is explained by the fact that within these countries, in 2009 the student population had a more disadvantaged background than in 2000 (see Table V.4.2 and Annex A6).

In Australia and Ireland, student performance would have declined more rapidly than actually observed if the changes in the socio-economic composition of the student population had been accounted for. In Finland, the results suggest performance decline when accounting for changes in student demographic and socio-economic characteristics. This is explained by the fact that, in 2009, the student population in these countries was more socio-economically advantaged than in 2000. In Hungary and Korea, adjusting for the socio-economic background of students reduces the estimate of a positive trend. In Thailand and Spain, the change in performance becomes negative after those adjustments, while it was insignificant without them.

ESTABLISHING AN OVERALL ESTIMATE OF READING PERFORMANCE TRENDS

Reading performance data across all PISA assessments can be combined into a single trend indicator. The results are provided in Table V.2.8 for both the observed performance of students in reading and for the performance after accounting for the above demographic and socio-economic characteristics. The resulting trends have been annualised, so the data reflect the performance changes for a single year. Annex A6 provides details on the methods used to obtain linear trends.

Figure V.2.10 compares these linear trends with annualised performance differences between 2000 and 2009. Four countries increased their reading performance when considering results from all assessments. In Korea, the linear trend suggests larger improvements, with the linear trend larger by 0.6 score points than the annualised performance difference between 2000 and 2009. This is due to rapid improvement in performance until 2006 followed by a slight decline in 2009. In the partner economy Hong Kong-China, the linear trend shows a rise of one score point per year between 2000 and 2009. After an initial decline in 2003, performance in Hong Kong-China improved in 2006 and was still higher in 2009. In Poland and Chile, linear trends also show slightly larger improvements. In Poland, this reflects a pattern similar to that seen in Korea, but with smaller changes. In Chile, the data demonstrate a large improvement between 2000 and 2006 followed by a much smaller change between the last two assessments.

For Israel and the partner countries Liechtenstein, Latvia and Brazil, the linear trends show smaller or even insignificant increases than the observed performance difference between 2000 and 2009. This is because in these countries, performance varied considerably across successive PISA assessments.

In Spain and the partner country Argentina, the linear trend is more negative than the difference in performance between 2000 and 2009. In Spain, this is due to a steady decline in performance from 2000 to 2006 and to recent improvements in 2009, with the mean performance still lower than it was in 2000. Similar patterns can be found in Argentina, with a decline between 2000 and 2006, followed by a smaller recent improvement.

COUNTRY-BY-COUNTRY COMPARISON OF READING TRENDS

Figures V.2.11, V.2.12 and V.2.13 summarise changes in the distribution of reading performance. The overall trend in mean performance between 2000 and 2009 is summarised by the dashed line, which corresponds to the linear trend discussed in the previous section. Where the dashed line is bold, mean performance has improved or declined in statistically significant ways. The constant line shows changes in the overall performance between successive PISA assessments.

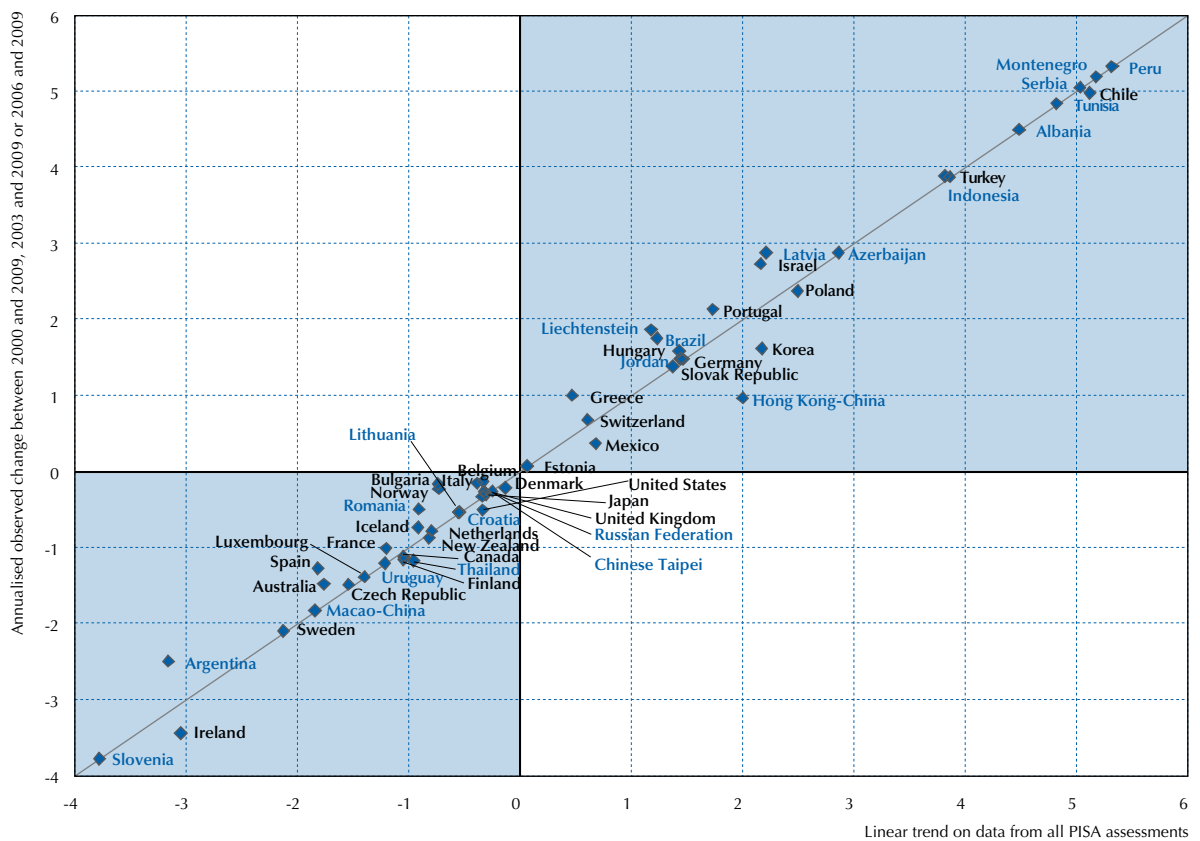


Performance trends for the lowest-achieving students are represented in the bottom part of the figure. The bottom margin of the dark blue area denotes performance at the 10th percentile and the bottom dark part denotes the performance range between the 10th and 25th percentiles. The top margin of the dark blue area denotes performance at the 90th percentile and the top dark part denotes the performance range between the 90th and 75th percentile. The range between the 10th and 90th percentiles represents the variation of student performance, so the narrower the blue area, the less diverse the reading performance in a particular assessment. Changes in the range covered by the blue area demonstrate trends in performance.

In Figures V.2.11, V.2.12 and V.2.13, countries are grouped by performance so one can compare changes in the distribution of performance in any one country with countries with similar overall performance. Figure V.2.11 shows countries with mean performance above the OECD average, Figure V.2.12 countries with mean performance around the OECD average and Figure V.2.13 countries with mean performance below the OECD average.

■ Figure V.2.10 ■

Linear trends and performance differences between 2000 and 2009



Source: OECD, PISA 2009 Database, Table V.2.8.

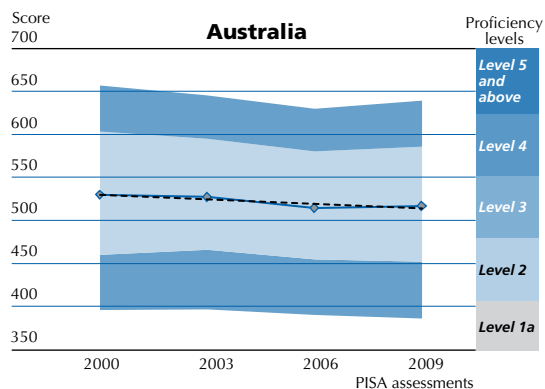
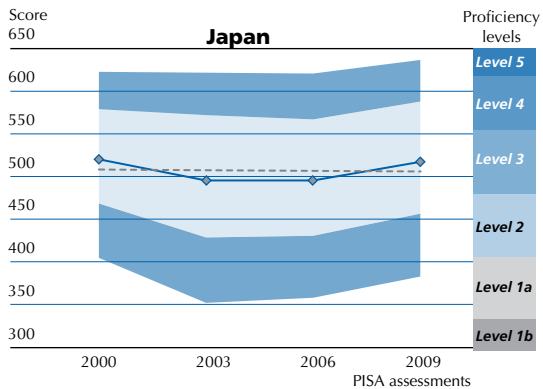
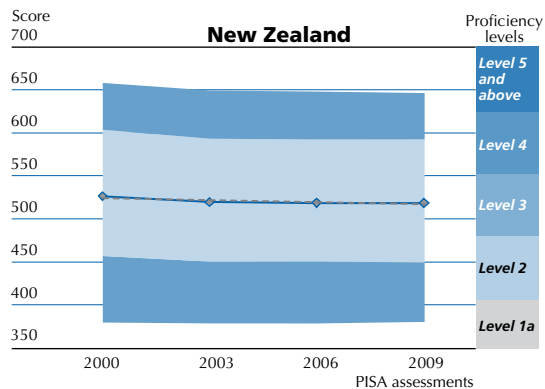
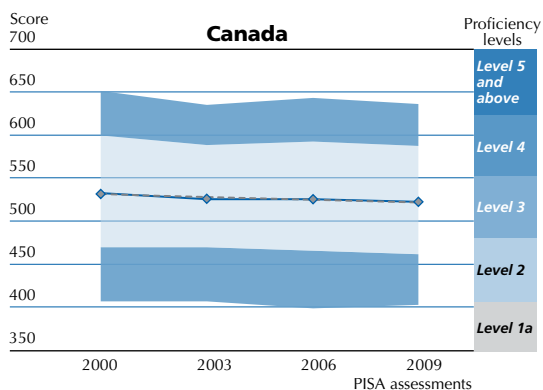
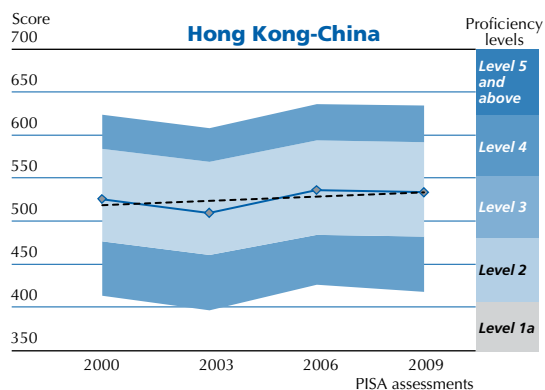
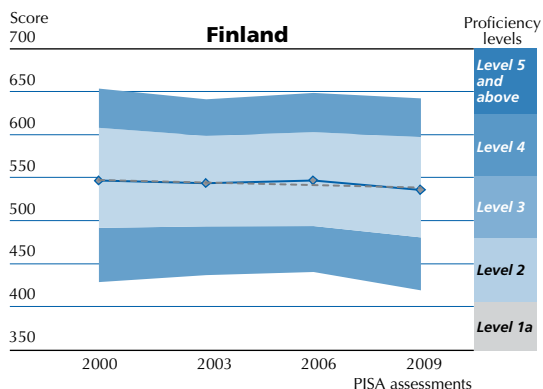
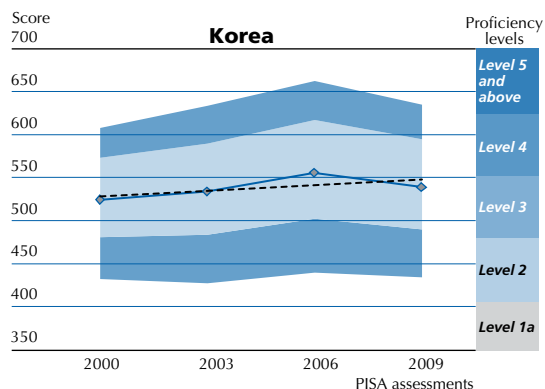
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From these country-by-country figures one can see that countries differ not only in how reading performance evolved for the average student, but also how performance trends for the highest-performing and the lowest-performing students differ. For example, two OECD countries, Korea and Poland, that perform above the average, having shown huge improvements since 2000, differ not only in the average performance and the magnitude of the trends, but also in terms of how different groups of students in those countries evolved over time. Both countries improved between 2000 and 2006 and declined slightly between 2006 and 2009. Nonetheless, in both countries, overall trends are significant and positive. While the trend in Korea was largely driven by improvements among the highest-achieving students with no change among the lowest-achieving, in Poland, the lowest-achieving students



■ Figure V.2.11 [Part 1/2] ■

Trends in reading performance: countries above the OECD average

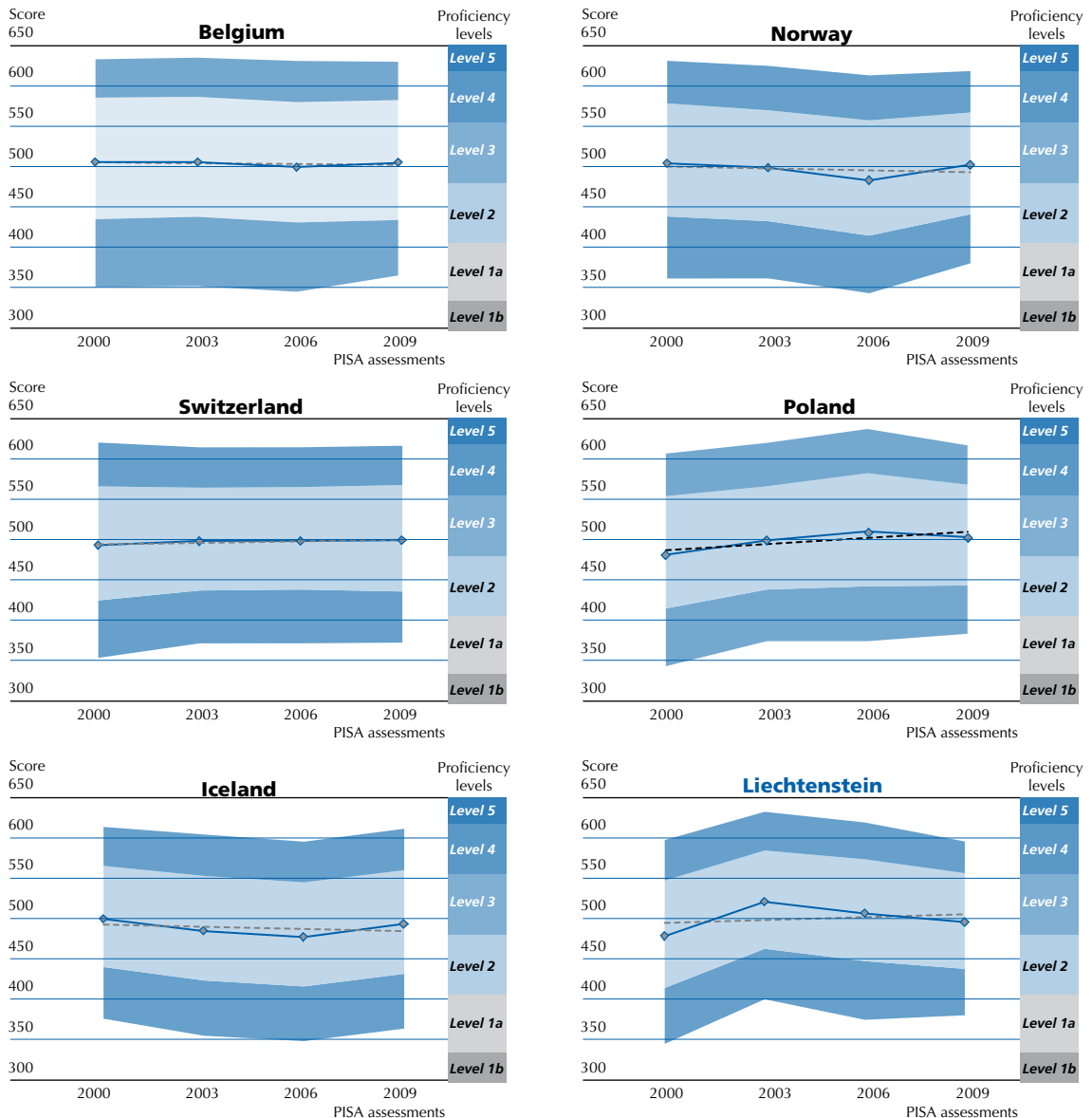


Source: OECD, PISA 2000, 2003, 2006, 2009 Databases
 StatLink <http://dx.doi.org/10.1787/888932359967>




■ Figure V.2.11 [Part 2/2] ■

Trends in reading performance: countries above the OECD average



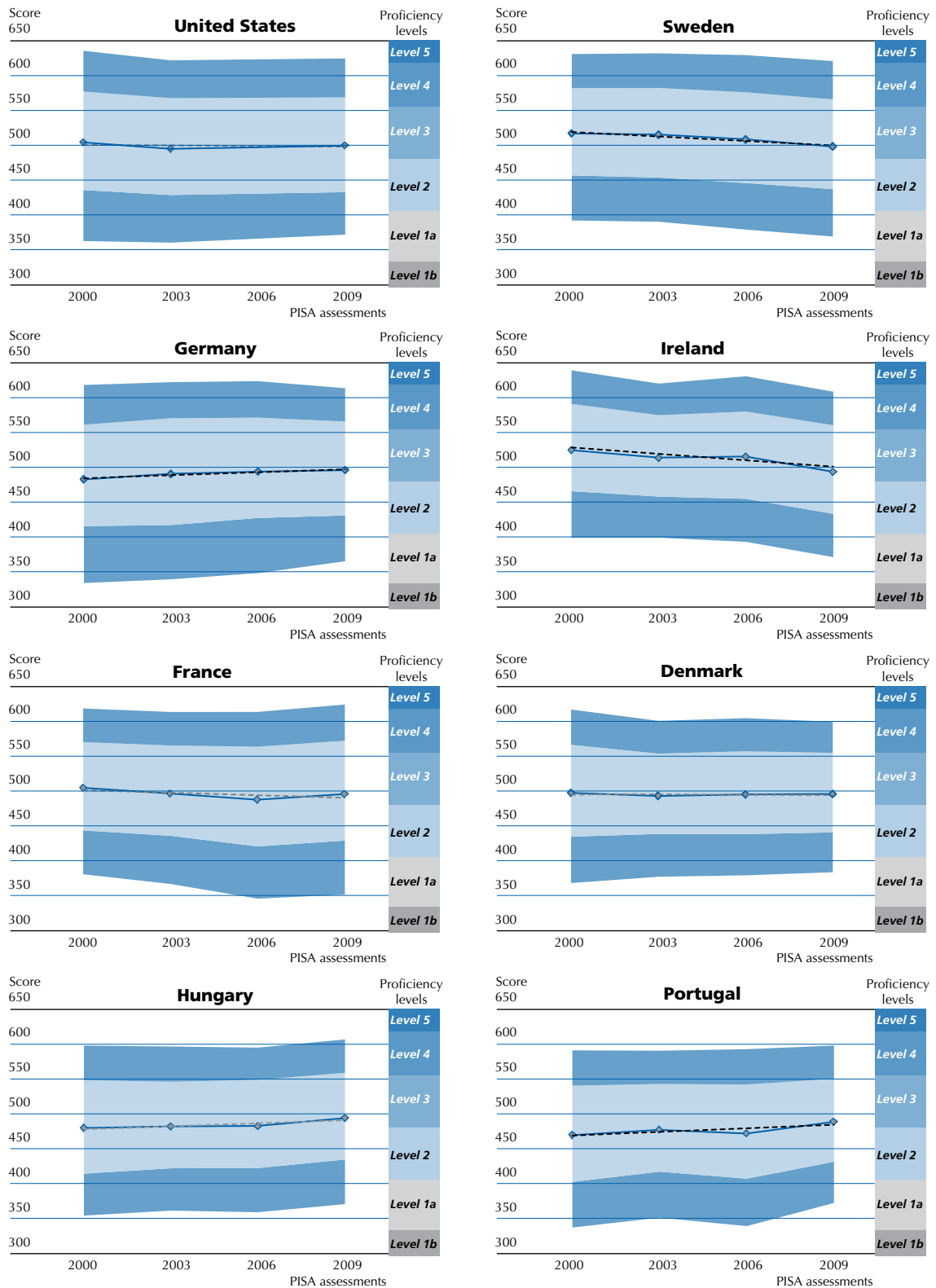
Source: OECD, PISA 2000, 2003, 2006, 2009 Databases

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increased their scores and there was no significant change among the highest-achieving students. When comparing figures for these two countries, it is also clear that, although the gap between the highest- and the lowest-achieving students in Korea widened, the opposite was true in Poland, such that the resulting performance gaps in Korea are still smaller than those in Poland.

■ Figure V.2.12 ■

Trends in reading performance: countries at the OECD average



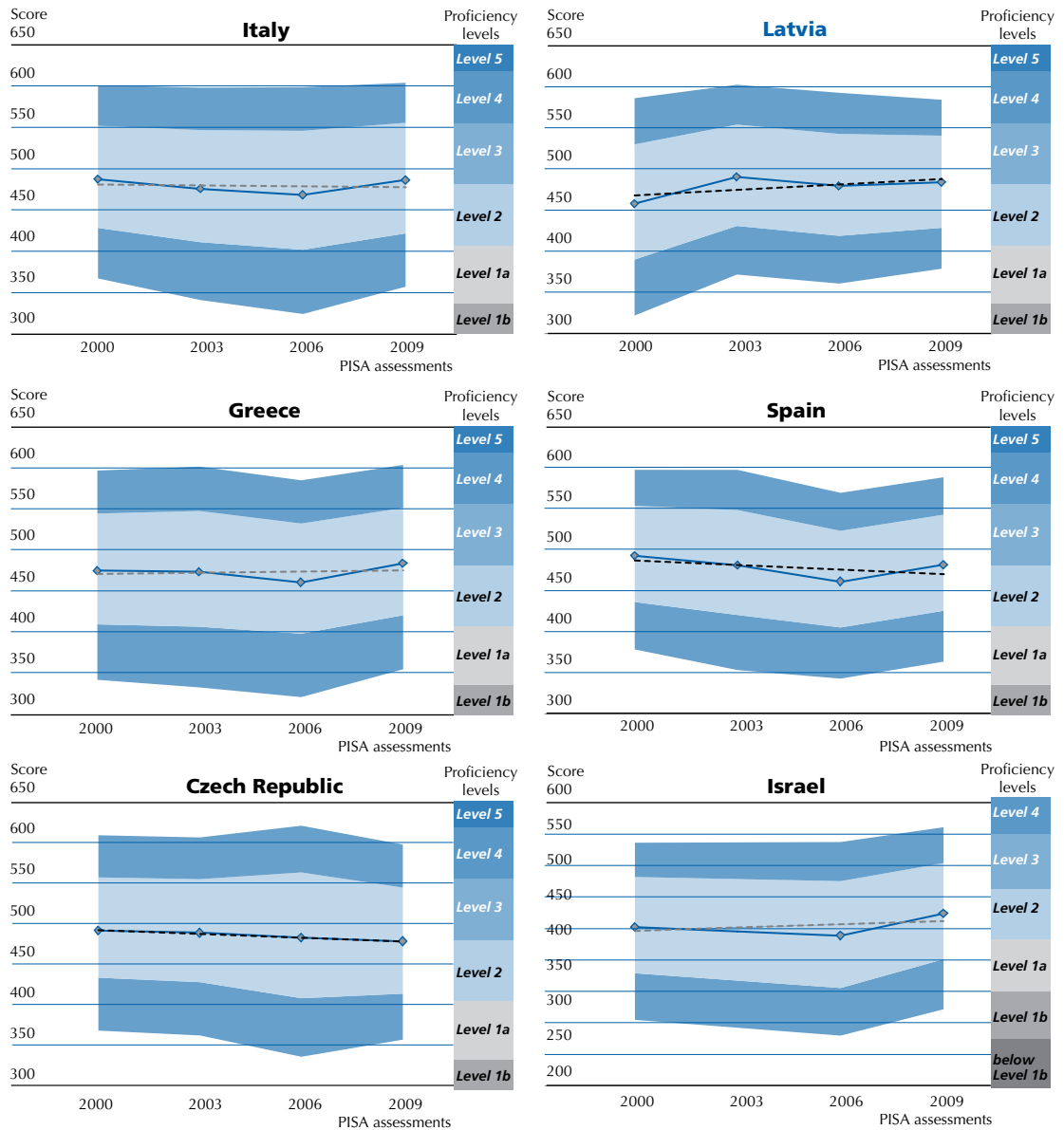
Source: OECD, PISA 2000, 2003, 2006, 2009 Databases.

StatLink  <http://dx.doi.org/10.1787/888932359967>




■ Figure V.2.13 [Part 1/3] ■

Trends in reading performance: countries below the OECD average

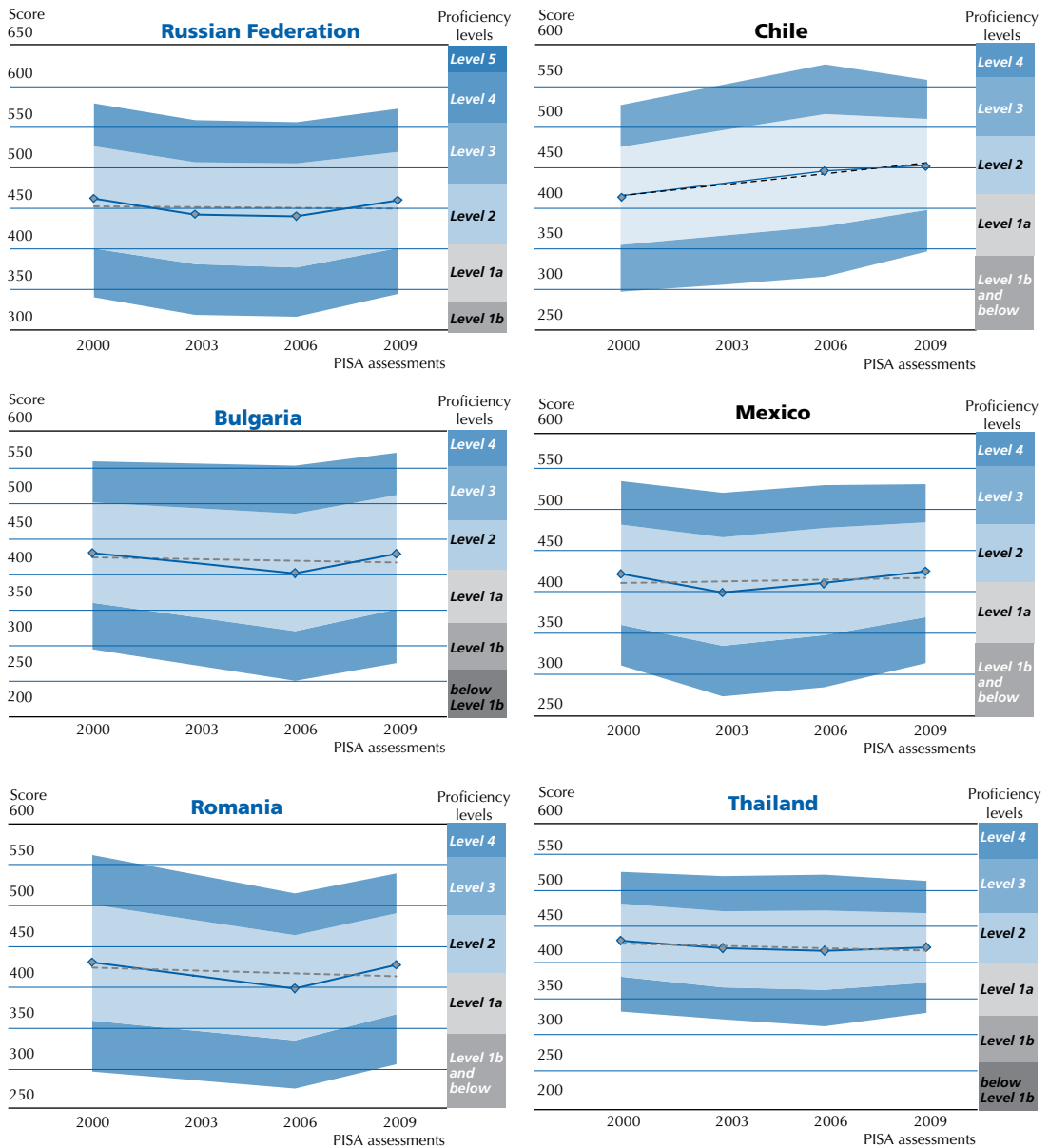


Source: OECD, PISA 2000, 2003, 2006, 2009 Databases.


StatLink  <http://dx.doi.org/10.1787/888932359967>

■ Figure V.2.13 [Part 2/3] ■

Trends in reading performance: countries below the OECD average

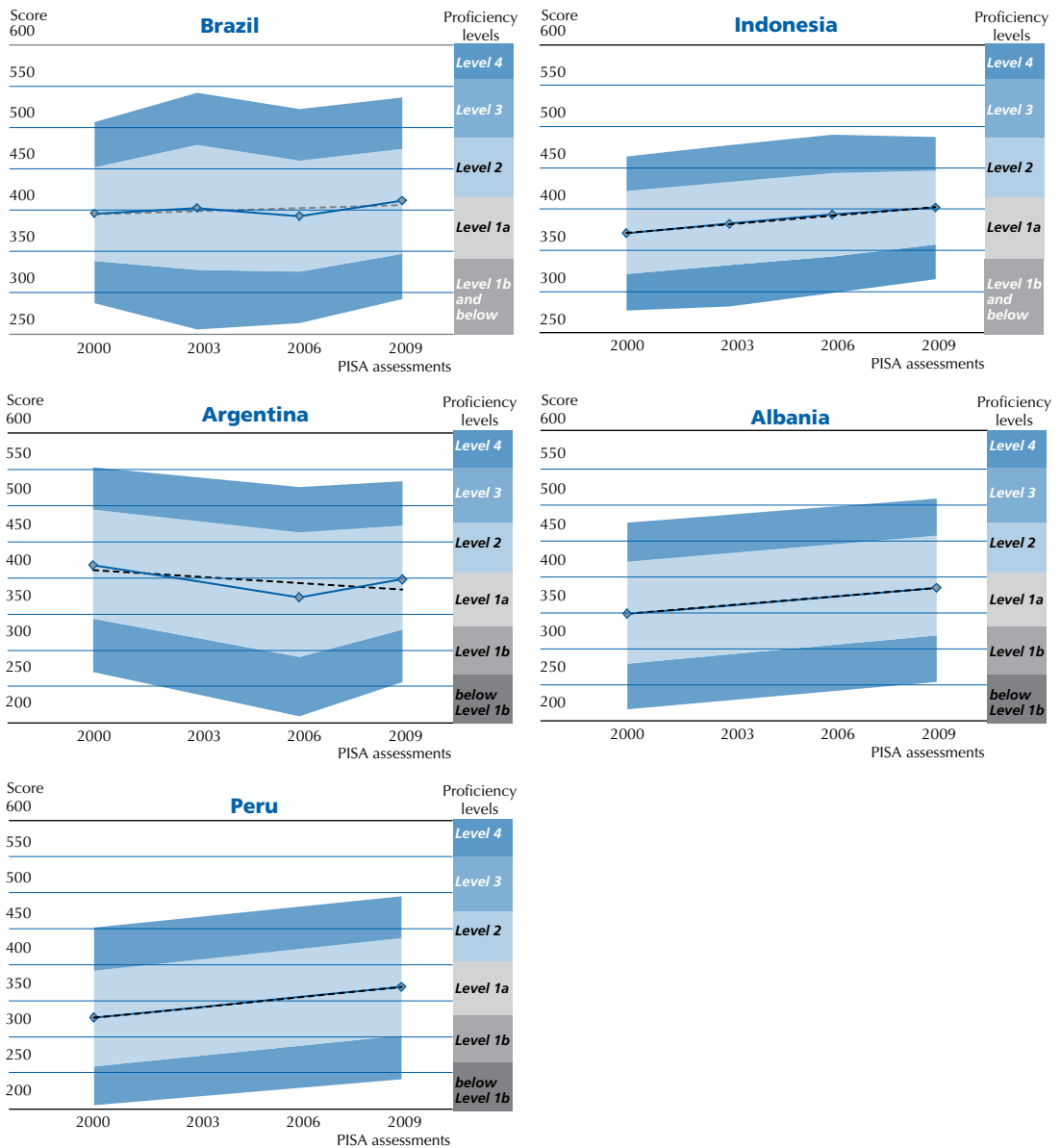


Source: OECD, PISA 2000, 2003, 2006, 2009 Databases.


StatLink  <http://dx.doi.org/10.1787/888932359967>



■ Figure V.2.13 [Part 3/3] ■
Trends in reading performance: countries below the OECD average



Source: OECD, PISA 2000, 2003, 2006, 2009 Databases.

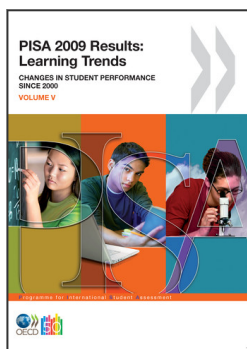
StatLink  <http://dx.doi.org/10.1787/888932359967>



Notes

1. The 2000 results for Luxembourg, the Netherlands and the United Kingdom are not considered here because of methodological problems that invalidate comparisons over time. Austrian data were corrected after publishing the PISA 2000 report; however, because of student boycotts, 2009 data were considered to be not comparable to those from previous assessments, so the trends for Austria are not discussed. Chile and Israel participated in PISA 2000. These countries joined the OECD recently, and for 2000 results reported in this volume are considered as OECD countries. The Slovak Republic and Turkey, which joined the OECD after 2000, did not participate in PISA 2000, so they are excluded from OECD averages for trends between 2000 and 2009. While the reading performance scale was not modified, it now has a mean of 496 and a standard deviation of 96 score points for the group of 26 countries that have comparable results from both the 2000 and 2009 assessments and that are now OECD members. More detailed explanations are given in Annex A5 and in the introduction to this volume.

2. Israel shows a seven percentage-point decline in the weighted percentage of girls assessed by PISA. Moreover, the socio-economic background of students in 2000 was more advantageous than in 2009. Overall, the adjusted 2000 results were lower than the original ones, which led to an increase in adjusted trends in comparison to observed ones. The sampling design for Israel in the PISA 2000 assessment did not account for the gender composition of schools, despite the different participation rates between boys and girls in Israel due to the fact that in some schools boys were not allowed to take part in the assessment. The gender distribution in the PISA 2000 data for Israel was subject to a relatively large sampling variance due to an inefficient sampling design. This section takes this into account by adjusting results for 2000 so that the gender distribution is comparable to the one observed in 2009. Nevertheless, trends in the socio-economic background of students and in the percentage of students with an immigrant background also played an important role in the observed performance changes for Israel.



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