



4

Reading performance among 15-year-olds

How well can 15-year-old students understand, use, reflect on and engage with written texts? This chapter compares countries' and economies' performance in reading in 2015 and analyses changes over the various PISA assessments. It highlights the differences between girls' and boys' performance.

A note regarding Israel

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.



The PISA assessment of reading focuses on students' ability to use written information in real-life situations. PISA defines reading literacy as "understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society" (OECD, 2016a). This definition goes beyond the traditional notion of decoding information and literally interpreting what is written. PISA's conception of reading literacy encompasses the range of situations in which people read, the different ways written texts are presented (e.g. in printed books, but also in fact sheets, online fora and news feeds), and the variety of ways in which readers approach and use texts, from the functional and finite, such as finding a particular piece of practical information, to the deep and far-reaching, such as understanding other ways of doing, thinking and being.

Reading was the major domain assessed in 2000, the first PISA assessment, and in 2009, the fourth PISA assessment. In this sixth PISA assessment, science is the major domain; thus, fewer students were assessed, and a smaller set of tasks (103 questions) was used in the reading assessment than in the science assessment. As a result, only an update on overall performance is possible, rather than the kind of in-depth analysis of knowledge and skills shown in the PISA 2009 report (OECD, 2010c).

What the data tell us

- Singapore is the highest-performing country in reading; the provinces of Alberta (Canada) and British Columbia (Canada) score close to Singapore's results.
- About 20% of students in OECD countries, on average, do not attain the baseline level of proficiency in reading (Level 2). In Canada, Estonia, Finland, Hong Kong (China), Ireland, Macao (China) and Singapore, less than 12% of students do not attain this level.
- On average across OECD countries, students' mean reading proficiency has not improved since 2000. Among the 42 countries/economies with valid data in at least five rounds of PISA, 12 saw an improving trend in performance, 6 a declining trend, and the remaining 24 a non-significant improvement or deterioration in performance.
- Between 2009 and 2015, Albania, Estonia, Georgia, Ireland, Macao (China), Moldova, Montenegro, the Russian Federation (hereafter "Russia"), Slovenia and Spain saw an increase in the share of students who attain the highest reading proficiency levels in PISA and a simultaneous decrease in the share of students who do not attain the baseline level of proficiency.
- On average across OECD countries, the gender gap in reading in favour of girls narrowed by 12 points between 2009 and 2015: boys' performance improved, particularly among the highest-achieving boys, while girls' performance deteriorated, particularly among the lowest-achieving girls.

This chapter presents the results of the assessment of reading in PISA 2015. Fifty-seven of the 72 participating countries and economies conducted the test on computer, and students were required to use such devices as a monitor, keyboard and mouse. The transfer of reading units from paper-based to computer-based delivery required some minor adjustments to the reading framework (see Box I.4.1). The remaining 15 countries and economies, as well as Puerto Rico, an unincorporated territory of the United States, delivered the test in pencil-and-paper format, as in previous cycles of PISA. The countries/economies that administered the paper-based test in 2015 are: Albania, Algeria, Argentina, the Former Yugoslav Republic of Macedonia (hereafter "FYROM"), Georgia, Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, Malta, Moldova, Romania, Trinidad and Tobago, and Viet Nam.

Despite differences in the assessment mode, the results for all countries are reported on the same scale.¹ Indeed, all countries, regardless of how the assessment was delivered, used the same reading questions, most of which were developed for the 2009 pencil-and-paper test and a few of which were used in the PISA 2000 assessment. Box I.4.1 summarises the measures taken to ensure the comparability of test results between the two modes of delivery; Annex A5 describes in greater detail how the reporting scales were linked.

STUDENT PROFICIENCY IN READING

The metric for the overall reading scale was set when reporting the results of the first PISA reading assessment, conducted in 2000. It is based on a mean for the 28 OECD countries that took part in the first PISA assessment equal to 500 score points, with a standard deviation of 100 points (OECD, 2001). To help interpret what students'



scores mean in substantive terms, the scale is divided into levels of proficiency that indicate the kinds of tasks that students at those levels are capable of completing successfully. The descriptions of the proficiency levels are revisited and updated each time a domain returns as a major domain, to reflect revisions in the framework as well as the demands of the new tasks developed for the assessment. The most recent descriptions of reading proficiency levels are based on the PISA 2009 assessment (OECD, 2010c).

Box I.4.1. **Assessing reading on screen: Changes in the PISA reading framework and in test questions between 2009 and 2015**

The main mode of delivery for the previous PISA assessments was paper. In moving to computer-based delivery in 2015, great care was taken to maintain comparability between the paper-based and the computer-based versions of test questions so that results could be reported on the same scale as in previous assessments, and to allow for comparisons of performance across countries that conducted the test in paper and computer modes.

Given that all the reading questions used in PISA 2015 were originally developed in prior cycles for testing on paper, only minor revisions to the framework were required. These were limited to clarifying the terminology, particularly distinguishing the text-display space (paper sheets or digital screens) from the text type (which is typically “fixed”, in a paper space, but can be “fixed” or “dynamic” in a digital space; the adjective “dynamic” refers to hypertexts, i.e. texts that, with navigation tools and certain features, make possible and even require non-sequential reading). The PISA 2015 reading test was delivered on paper or computer, but used only fixed-text formats; hypertexts that included links or other navigation features were not used.

In revisiting the items for delivery on computer, the following design principles were considered:

- **Item types:** The computer provides a range of new item formats, such as drag-and-drop and hotspots. Since the purpose of the 2015 assessment of reading is to compare results with prior cycles and observe trends, the vast majority of response formats remained unchanged in 2015, although some hotspot items were used to enable computer-coding of items that were previously scored by experts. The use of hotspot formats (where students must click on a part of a figure, highlight an excerpt, or connect two or more elements in the response space) was limited to items where no expert judgement was required to assign credit.
- **Text presentation:** A defining feature of fixed texts is that the length or amount of the text is immediately visible to the reader. Clearly, displaying long texts on a single page or screen is impossible, both on paper and on a computer, and the space available on an assessment form displayed on a screen is even smaller than that available on a sheet of paper in a test booklet. To allow readers to quickly grasp the length or amount of text, long texts were presented on several pages/screens, without requiring readers to scroll down. The test platform ensured that students would browse through all pages of the stimulus text before they saw the first question.
- **Computer skills:** Just as paper-based assessments rely on a set of fundamental skills for working with printed materials, so computer-based assessments rely on a set of fundamental skills for using computers. These include knowledge of basic hardware (e.g. keyboard and mouse) and basic conventions (e.g. arrows to move forward and specific buttons to press to execute commands). Every effort was made to keep the requirements of computer skills to a minimum, and students could practice interacting with different response formats and stimulus presentations before starting the test. Of course, this practice was not expected to be sufficient to remediate a fundamental lack of experience or familiarity with computers.

The equivalence of the paper-based and computer-based versions of each question, and of the overall scale formed by the test questions, was then tested during the field trial for PISA 2015. About two-thirds (65) of the test questions included in the main study were found to be fully equivalent, and to support the comparison of levels of performance across modes and with respect to previous PISA assessments. The difficulty of the remaining 38 questions was found to differ across modes, and that was taken into account when results for the main study were scaled. Annex A5 provides further details on the mode-effect study in the field trial and the scaling models used in PISA 2015.



Average performance in reading

One way to summarise student performance and to compare the relative standing of countries in reading is through countries' and economies' mean performance, both relative to each other and to the OECD mean. For PISA 2015, the mean performance across the 35 OECD countries is 493 score points, with an average standard deviation of 96 points.

When interpreting mean performance, only those differences among countries and economies that are statistically significant should be taken into account (see Box I.2.3 in Chapter 2). Figure I.4.1 shows each country's/economy's mean score and also indicates for which pairs of countries/economies the differences between the means are statistically significant. For country/economy A, shown in the middle column, the mean score achieved by students is shown in the left column, and the countries/economies whose mean scores are not statistically significantly different are listed in the right column. For all other countries/economies that are not listed in the right column, country/economy B scores higher than country/economy A if country/economy B is situated above country/economy A in the middle column, and scores lower if country/economy B is situated below country/economy A. For example: Singapore, whose mean score is 535 points, has a higher score than all other PISA-participating countries/economies; but the performance of Hong Kong (China), which appears second on the list with a mean score of 527 points, cannot be distinguished with confidence from that of Canada, Finland and Ireland.

In Figure I.4.1, countries and economies are divided into three broad groups: those whose mean scores are statistically around the OECD mean (highlighted in dark blue), those whose mean scores are above the OECD mean (highlighted in pale blue), and those whose mean scores are below the OECD mean (highlighted in medium blue).

As shown in Figure I.4.1, Singapore is the highest-performing country in reading, with a mean score of 535 points – about 40 points above the OECD average. Three countries perform below Singapore, but at least 30 points above the OECD average (Canada, Finland and Hong Kong [China]), and five countries perform between 20 and 30 points higher than the OECD average (Estonia, Ireland, Japan, Korea and Norway). Thirteen other countries and economies – Australia, Belgium, Denmark, France, Germany, Macao (China), the Netherlands, New Zealand, Poland, Portugal, Slovenia, Sweden and the United Kingdom – also score above the OECD average. Meanwhile, Beijing-Shanghai-Jiangsu-Guangdong (China) (hereafter “B-S-J-G [China]”), the Russian Federation (hereafter “Russia”), Spain, Switzerland, Chinese Taipei, the United States and Viet Nam perform around the OECD average; and 41 countries and economies perform below the OECD average.

Across OECD countries, performance differences are large: about 100 score points, the equivalent of three years of school (see Box I.2.2 in Chapter 2), separate the mean scores of the highest-performing OECD countries (Canada and Finland) from the lowest-performing OECD countries (Mexico and Turkey). When the partner countries and economies are considered along with OECD countries, this difference amounts to 189 score points.

Because the figures are derived from samples, it is not possible to determine a country's or economy's precise ranking among all countries and economies. However, it is possible to determine, with confidence, a range of rankings in which the country's/economy's performance lies (Figure I.4.2). For subnational entities whose results are reported in Annex B2, a rank order was not estimated; but the mean score and its confidence interval allow for a comparison of performance of these subnational entities against that of countries and economies. For example, students in public schools in Massachusetts (United States) shows a mean score of 527 points in reading, close to the score achieved, on average, by students in Canada, Finland and Hong Kong (China), and clearly above the national average for the United States (497 points).

Trends in average reading performance since 2009

The change in a school system's average performance over time indicates how and to what extent the system is progressing towards achieving the goal of providing its students with the knowledge and skills needed to become full participants in a knowledge-based society. This section focuses on recent trends since 2009, the last time reading was the major domain. Trends over a longer period of time, since PISA 2000, are discussed in the following section. Trends in reading performance up to 2015 are available for 64 countries and economies. PISA 2015 results for 59 countries and economies can be compared with data from PISA 2009, the last time reading was a major domain. For five countries and economies, however, only PISA 2012 results in reading are available and can be compared with 2015 results. The average three-year trend up to 2015 can be calculated and compared across all 64 countries. It indicates the average rate of change in performance observed, per three-year period, between 2009 and 2015. (For further details on the estimation of the three-year trend, see Annex A5).



Figure I.4.1 ■ Comparing countries' and economies' performance in reading

Mean score	Comparison country/ economy	Countries and economies whose mean score is NOT statistically significantly different from the comparison country/s/economy's score
535	Singapore	
527	Hong Kong (China)	Canada, Finland, Ireland
527	Canada	Hong Kong (China), Finland, Ireland
526	Finland	Hong Kong (China), Canada, Ireland
521	Ireland	Hong Kong (China), Canada, Finland, Estonia, Korea, Japan
519	Estonia	Ireland, Korea, Japan, Norway
517	Korea	Ireland, Estonia, Japan, Norway, New Zealand, Germany
516	Japan	Ireland, Estonia, Korea, Norway, New Zealand, Germany
513	Norway	Estonia, Korea, Japan, New Zealand, Germany, Macao (China)
509	New Zealand	Korea, Japan, Norway, Germany, Macao (China), Poland, Slovenia, Netherlands
509	Germany	Korea, Japan, Norway, New Zealand, Macao (China), Poland, Slovenia, Netherlands, Australia, Sweden
509	Macao (China)	Norway, New Zealand, Germany, Poland, Slovenia
506	Poland	New Zealand, Germany, Macao (China), Slovenia, Netherlands, Australia, Sweden, Denmark, France
505	Slovenia	New Zealand, Germany, Macao (China), Poland, Netherlands, Australia, Sweden, Denmark
503	Netherlands	New Zealand, Germany, Poland, Slovenia, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, B-S-J-G (China)
503	Australia	Germany, Poland, Slovenia, Netherlands, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, B-S-J-G (China)
500	Sweden	Germany, Poland, Slovenia, Netherlands, Australia, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
500	Denmark	Poland, Slovenia, Netherlands, Australia, Sweden, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
499	France	Poland, Netherlands, Australia, Sweden, Denmark, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
499	Belgium	Netherlands, Australia, Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
498	Portugal	Netherlands, Australia, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
498	United Kingdom	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Switzerland
497	Chinese Taipei	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, United States, Spain, Russia, B-S-J-G (China), Switzerland
497	United States	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, Spain, Russia, B-S-J-G (China), Switzerland
496	Spain	Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Russia, B-S-J-G (China), Switzerland
495	Russia	Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Viet Nam
494	B-S-J-G (China)	Netherlands, Australia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, Switzerland, Latvia, Czech Republic, Croatia, Viet Nam, Austria, Italy
492	Switzerland	Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Russia, B-S-J-G (China), Latvia, Czech Republic, Croatia, Viet Nam, Austria, Italy
488	Latvia	Russia, B-S-J-G (China), Switzerland, Czech Republic, Croatia, Viet Nam, Austria, Italy, CABA (Argentina)
487	Czech Republic	Russia, B-S-J-G (China), Switzerland, Latvia, Croatia, Viet Nam, Austria, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
487	Croatia	Russia, B-S-J-G (China), Switzerland, Latvia, Czech Republic, Viet Nam, Austria, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
487	Viet Nam	Russia, B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Austria, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
485	Austria	B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Viet Nam, Italy, Iceland, Luxembourg, Israel, CABA (Argentina)
485	Italy	B-S-J-G (China), Switzerland, Latvia, Czech Republic, Croatia, Viet Nam, Austria, Iceland, Luxembourg, Israel, CABA (Argentina)
482	Iceland	Czech Republic, Croatia, Viet Nam, Austria, Italy, Luxembourg, Israel, CABA (Argentina)
481	Luxembourg	Czech Republic, Croatia, Viet Nam, Austria, Italy, Iceland, Israel, CABA (Argentina)
479	Israel	Czech Republic, Croatia, Viet Nam, Austria, Italy, Iceland, Luxembourg, CABA (Argentina), Lithuania
475	CABA (Argentina)	Latvia, Czech Republic, Croatia, Viet Nam, Austria, Italy, Iceland, Luxembourg, Israel, Lithuania, Hungary, Greece
472	Lithuania	Israel, CABA (Argentina), Hungary, Greece
470	Hungary	CABA (Argentina), Lithuania, Greece
467	Greece	CABA (Argentina), Lithuania, Hungary, Chile
459	Chile	Greece, Slovak Republic
453	Slovak Republic	Chile, Malta
447	Malta	Slovak Republic, Cyprus ¹
443	Cyprus¹	Malta
437	Uruguay	Romania, United Arab Emirates, Bulgaria, Turkey
434	Romania	Uruguay, United Arab Emirates, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Colombia
434	United Arab Emirates	Uruguay, Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago
432	Bulgaria	Uruguay, Romania, United Arab Emirates, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Mexico
428	Turkey	Uruguay, Romania, United Arab Emirates, Bulgaria, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Mexico
427	Costa Rica	Romania, United Arab Emirates, Bulgaria, Turkey, Trinidad and Tobago, Montenegro, Colombia, Mexico
427	Trinidad and Tobago	Romania, United Arab Emirates, Bulgaria, Turkey, Costa Rica, Montenegro, Colombia, Mexico
427	Montenegro	Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Colombia, Mexico
425	Colombia	Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Mexico
423	Mexico	Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Moldova
416	Moldova	Mexico, Thailand
409	Thailand	Moldova, Jordan, Brazil, Albania, Georgia
408	Jordan	Thailand, Brazil, Albania, Georgia
407	Brazil	Thailand, Jordan, Albania, Qatar, Georgia
405	Albania	Thailand, Jordan, Brazil, Qatar, Georgia, Peru, Indonesia
402	Qatar	Brazil, Albania, Georgia, Peru, Indonesia
401	Georgia	Thailand, Jordan, Brazil, Albania, Qatar, Peru, Indonesia
398	Peru	Albania, Qatar, Georgia, Indonesia
397	Indonesia	Albania, Qatar, Georgia, Peru
361	Tunisia	Dominican Republic
358	Dominican Republic	Tunisia, FYROM, Algeria
352	FYROM	Dominican Republic, Algeria, Lebanon
350	Algeria	Dominican Republic, FYROM, Kosovo, Lebanon
347	Kosovo	Algeria, Lebanon
347	Lebanon	FYROM, Algeria, Kosovo

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
 Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: OECD, PISA 2015 Database, Table I.4.3.

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Figure I.4.2 [Part 1/2] ■ Reading performance among PISA 2015 participants, at national and subnational levels

	Reading scale					
	Mean score	95% confidence interval	Range of ranks			
			OECD countries		All countries/economies	
			Upper rank	Lower rank	Upper rank	Lower rank
<i>British Columbia (Canada)</i>	536	525 - 547				
Singapore	535	532 - 538			1	1
<i>Alberta (Canada)</i>	533	523 - 544				
<i>Quebec (Canada)¹</i>	532	523 - 541				
<i>Ontario (Canada)</i>	527	519 - 536				
<i>Massachusetts (United States)</i>	527	515 - 539				
Hong Kong (China)	527	521 - 532			2	5
Canada	527	522 - 531	1	3	2	4
Finland	526	521 - 531	1	3	2	5
<i>Castile and Leon (Spain)</i>	522	513 - 530				
Ireland	521	516 - 526	2	6	4	8
<i>Madrid (Spain)</i>	520	512 - 529				
Estonia	519	515 - 523	3	6	5	8
Korea	517	511 - 524	3	8	4	9
<i>Nova Scotia (Canada)</i>	517	508 - 527				
Japan	516	510 - 522	3	8	5	10
<i>Prince Edward Island (Canada)</i>	515	503 - 527				
<i>Navarre (Spain)</i>	514	504 - 524				
Norway	513	508 - 518	5	9	7	11
<i>Trento (Italy)</i>	512	506 - 517				
<i>Flemish community (Belgium)</i>	511	505 - 516				
New Zealand	509	505 - 514	7	11	9	14
Germany	509	503 - 515	6	12	8	15
<i>Galicia (Spain)</i>	509	500 - 518				
Macao (China)	509	506 - 511			10	13
<i>Aragon (Spain)</i>	506	494 - 519				
Poland	506	501 - 511	8	14	10	17
<i>New Brunswick (Canada)</i>	505	495 - 516				
Slovenia	505	502 - 508	9	13	12	17
<i>Lombardia (Italy)</i>	505	496 - 514				
<i>Newfoundland and Labrador (Canada)</i>	505	498 - 512				
Netherlands	503	498 - 508	9	17	12	21
Australia	503	500 - 506	10	16	13	19
<i>Bolzano (Italy)</i>	503	486 - 519				
<i>Cantabria (Spain)</i>	501	490 - 512				
<i>German-speaking community (Belgium)</i>	501	493 - 509				
Sweden	500	493 - 507	10	21	13	26
<i>North Carolina (United States)</i>	500	489 - 511				
Denmark	500	495 - 505	12	21	14	25
<i>England (United Kingdom)</i>	500	493 - 506				
<i>Catalonia (Spain)</i>	500	491 - 508				
France	499	494 - 504	12	21	15	26
<i>Castile-La Mancha (Spain)</i>	499	491 - 507				
<i>Comunidad Valenciana (Spain)</i>	499	492 - 506				
Belgium	499	494 - 503	13	21	16	26
<i>Manitoba (Canada)</i>	498	489 - 508				
Portugal	498	493 - 503	13	22	16	27
United Kingdom	498	493 - 503	13	22	16	27
<i>Asturias (Spain)</i>	498	485 - 510				
Chinese Taipei	497	492 - 502			17	27
<i>Northern Ireland (United Kingdom)</i>	497	488 - 506				
United States	497	490 - 504	13	22	16	28
<i>Saskatchewan (Canada)</i>	496	489 - 503				
Spain	496	491 - 500	16	22	19	28
Russia	495	489 - 501			19	30
B-S-J-G (China)	494	484 - 504			15	33
<i>Scotland ((United Kingdom)</i>	493	489 - 498				
Switzerland	492	486 - 498	18	24	22	32
<i>Basque Country (Spain)</i>	491	482 - 501				
<i>La Rioja (Spain)</i>	491	472 - 509				
Latvia	488	484 - 491	22	26	28	34
Czech Republic	487	482 - 492	22	27	27	35
Croatia	487	482 - 492			27	35
Viet Nam	487	479 - 494			27	37
<i>Murcia (Spain)</i>	486	477 - 496				

* See note 1 under Figure I.4.1.

1. Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.

2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.

Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue. Regions are shown in black italics (OECD countries) or blue italics (partner countries).

Countries and economies are ranked in descending order of mean reading performance.

Source: OECD, PISA 2015 Database.


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Figure I.4.2 [Part 2/2] ■ Reading performance among PISA 2015 participants, at national and subnational levels

	Reading scale					
	Mean score	95% confidence interval	Range of ranks			
			OECD countries		All countries/economies	
		Upper rank	Lower rank	Upper rank	Lower rank	
Austria	485	479 - 490	23	29	29	37
Italy	485	480 - 490	23	28	29	37
<i>Balearic Islands (Spain)</i>	485	469 - 500				
<i>French community (Belgium)</i>	483	474 - 493				
<i>Canary Islands (Spain)</i>	483	475 - 491				
Iceland	482	478 - 485	25	29	33	38
Luxembourg	481	479 - 484	26	29	33	38
Israel	479	472 - 486	25	30	32	39
<i>Andalusia (Spain)</i>	479	470 - 487				
<i>Wales (United Kingdom)</i>	477	470 - 484				
<i>Dubai (UAE)</i>	475	472 - 479				
<i>Extremadura (Spain)</i>	475	467 - 484				
<i>CABA (Argentina)</i>	475	461 - 489			30	41
Lithuania	472	467 - 478			38	41
<i>Região Autónoma dos Açores (Portugal)</i>	470	464 - 475				
Hungary	470	464 - 475	30	31	38	41
<i>Bogotá (Colombia)</i>	469	460 - 478				
Greece	467	459 - 476	30	32	38	42
Chile	459	454 - 464	32	33	41	43
<i>Campania (Italy)</i>	455	444 - 466				
Slovak Republic	453	447 - 458	32	33	42	43
<i>Medellín (Colombia)</i>	451	441 - 461				
<i>Manizales (Colombia)</i>	449	440 - 458				
Malta	447	443 - 450			44	45
Cyprus*	443	440 - 446			44	46
Uruguay	437	432 - 442			46	49
<i>Sharjah (UAE)</i>	435	415 - 455				
Romania	434	426 - 442			46	52
United Arab Emirates	434	428 - 439			46	50
<i>Cali (Colombia)</i>	432	422 - 443				
Bulgaria	432	422 - 442			46	55
Turkey	428	421 - 436	34	35	47	55
Costa Rica	427	422 - 433			49	55
Trinidad and Tobago	427	424 - 430			49	54
Montenegro	427	424 - 430			49	54
Colombia	425	419 - 431			50	55
Mexico	423	418 - 428	34	35	51	55
<i>Abu Dhabi (UAE)</i>	419	409 - 429				
Moldova	416	411 - 421			55	57
Puerto Rico²	410	396 - 424				
Thailand	409	403 - 416			56	60
Jordan	408	402 - 414			57	61
Brazil	407	402 - 413			57	61
Albania	405	397 - 413			57	63
Qatar	402	400 - 404			60	63
<i>Ajman (UAE)</i>	401	390 - 413				
Georgia	401	395 - 407			59	64
<i>Fujairah (UAE)</i>	398	383 - 412				
Peru	398	392 - 403			61	64
Indonesia	397	392 - 403			61	64
<i>Ras Al Khaimah (UAE)</i>	391	371 - 412				
<i>Umm Al Quwain (UAE)</i>	386	375 - 396				
Tunisia	361	355 - 367			65	66
Dominican Republic	358	352 - 364			65	67
FYROM	352	349 - 355			67	69
Algeria	350	344 - 356			67	70
Kosovo	347	344 - 350			68	70
Lebanon	347	338 - 355			67	70

* See note 1 under Figure I.4.1.

1. Results for the province of Quebec in this table should be treated with caution due to a possible non-response bias.


2. Puerto Rico is an unincorporated territory of the United States. As such, PISA results for the United States do not include Puerto Rico.

Note: OECD countries are shown in bold black. Partner countries, economies and subnational entities that are not included in national results are shown in bold blue.

Regions are shown in black italics (OECD countries) or blue italics (partner countries).

Countries and economies are ranked in descending order of mean reading performance.

Source: OECD, PISA 2015 Database.

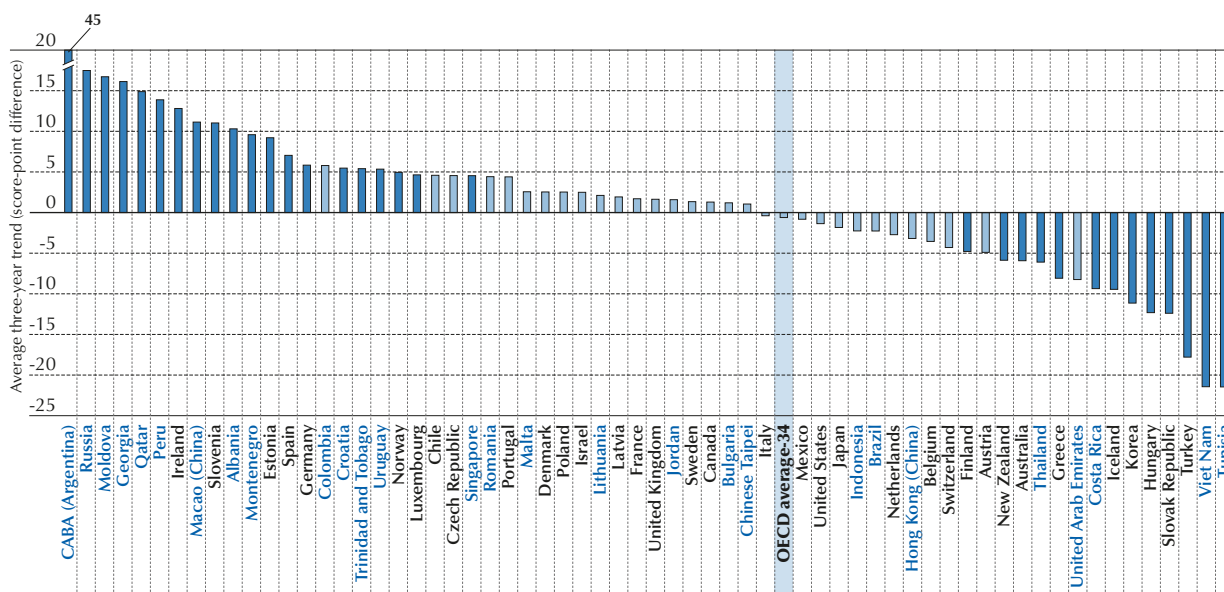
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Of the 64 countries and economies with comparable data in reading performance, 20 show a positive trend in mean reading performance across the most recent PISA assessments, 31 show a stable trend, and the remaining 13 countries and economies show a deteriorating trend in average student performance. Among OECD countries, average improvements (i.e. positive three-year trends) in reading performance between 2009 and 2015 are observed in Estonia, Germany, Ireland, Luxembourg, Norway, Slovenia and Spain.

Figure I.4.3 shows that Ciudad Autónoma de Buenos Aires (Argentina) (hereafter “CABA [Argentina]”), Georgia, Moldova and Russia, saw an average improvement every three years of more than 15 score points in reading (or the equivalent of half a year of school; see Box I.2.2 in Chapter 2) throughout their participation in PISA assessments. Albania, Ireland, Macao (China), Peru, Qatar and Slovenia saw an average improvement of more than ten score points every three years. These are rapid and significant improvements. Most of these countries and economies have participated in all three PISA assessments since 2009; CABA (Argentina) participated as an adjudicated region in 2012 for the first time, and Moldova and Georgia participated in 2010 (as part of PISA 2009+) and 2015. Ten other countries and economies show a significant positive trend in reading performance of between four and ten score points per three-year period.

Figure I.4.3 ■ Average three-year trend in reading performance since 2009



Notes: Statistically significant differences are shown in a darker tone (see Annex A3).

The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Only countries/economies with valid results for PISA 2015 and for PISA 2009 and/or PISA 2012 are shown.

Countries and economies are ranked in descending order of the average three-year trend in reading performance.

Source: OECD, PISA 2015 Database, Table I.4.4a.

StatLink <http://dx.doi.org/10.1787/888933432525>

In 2009, the average 15-year-old in Russia scored 459 points on the PISA reading assessment, 475 score points in 2012, and 495 points in 2015. Improvements over time were also consistent in Qatar, where the average reading performance improved steadily from 372 points in 2009 to 388 points in 2012 and 402 points in 2015; and in Peru, where performance improved from 370 points in 2009 to 384 points in 2012 and 398 points in 2015.

At any point in time, countries and economies share similar levels of performance with other countries and economies. But as time passes and school systems evolve, certain countries and economies improve their performance, pull ahead of the group of countries with which they shared similar performance levels, and catch up to another group of countries. Other countries and economies see a decline in their performance, and fall behind in rankings relative to other countries. Figure I.4.4 shows, for each country and economy, those other countries and economies that had similar reading performance in 2009 but whose performance differed in 2015, reflecting a faster, or slower, improvement or deterioration over time.



Figure I.4.4 also shows those countries and economies that had similar reading performance in 2015, at the end of the period, but whose performance differed in 2009. In 2009, for example, Spain performed similarly in reading to Croatia, the Czech Republic, Greece, Israel, Italy, Latvia, the Slovak Republic and Slovenia. Spain scored higher in 2015 than in 2009, but Slovenia improved faster than Spain, and scored even higher than Spain in 2015. Croatia also improved, but less than Spain, the Slovak Republic saw a deterioration of performance, and in the Czech Republic, Greece, Israel, Italy and Latvia, performance remained stable, so that by 2015, all of these countries/economies scored below Spain in reading.

Compared with Japan, whose performance remained stable between 2009 and 2015, Figure I.4.4 shows that Canada and Singapore performed similarly in 2009, but in 2015 scored significantly above Japan. Korea, whose mean score was higher in 2009, performed similarly to Japan in 2015 as a result of a deteriorating trend. Estonia, Germany, Ireland and Norway also scored at the same level as Japan in 2015, but as a result of improvements over the period.

Figure I.4.5 shows the relationship between each country's/economy's average reading performance in PISA 2009 and the average trend between 2009 and 2015. Countries and economies that show the largest improvement in this period are found both among countries that performed around the OECD average in 2009, such as Estonia and Ireland, and among countries that had comparatively low performance in PISA 2009, such as Moldova, Qatar and Russia. The correlation between a country's/economy's PISA 2009 reading score and the average trend in reading in that country/economy is -0.3 – indicating a weak association.

Annex A5 discusses the extent to which changes in the scaling procedures used for PISA 2015 influence the results of reported changes between PISA 2009 and PISA 2015. Most of the negative changes observed are similar under alternative scaling models, but the negative change reported for Korea over these six years (-22 score points; see Table I.4.4a) is, in part, the result of the change in scaling approach. PISA 2009 results would have been lower than reported had they been generated under the 2015 scaling approach, and the difference between 2015 and 2009 would have been only -9 points. The negative change reported for Thailand (-12 points) would, in turn, have been only -3 points had the PISA 2009 results been revised to reflect the PISA 2015 scaling approach. Under the 2015 approach, PISA 2009 results would also have been lower for Denmark; as a consequence, the improvement between 2009 and 2015, which is reported as non-significant for Denmark, would have been larger if the most recent scaling approach had been used throughout the years.

Annex A5 also shows that the improvement between PISA 2009 and PISA 2015 in the mean scores for Colombia, Trinidad and Tobago and Uruguay would have been smaller and most likely been reported as not significant (+7 points for Colombia and Trinidad and Tobago, +2 points for Uruguay) had PISA 2009 results been generated under the same scaling approach as PISA 2015 results. In all remaining cases, the significance and/or direction of changes do not vary depending on whether the PISA 2015 approach to scaling is applied to previous PISA assessments, or whether the original results are used for trend comparisons.

Trends in reading performance accounting for changes in enrolment rates and demographic changes

Improvements in a country's or economy's overall reading performance may be the result of specific education policies; they may also be due to demographic or socio-economic changes in the country's/economy's population profile. For example, because of trends in enrolment rates or migration, the characteristics of the PISA reference population – 15-year-old students in grade 7 or above – may have shifted.

Adjusted trends shed light on changes in reading performance that are not due to alterations in the demographic characteristics of the student population or the sample. Table I.4.4d presents the average three-year trend in reading performance at the median and at the top of the distribution among all 15-year-olds – assuming that 15-year-olds who are not represented in the PISA sample would have performed among the weakest 50%, had they been assessed.² The differences between observed and adjusted trends thus reflect changes in the percentage of the 15-year-olds that the PISA sample represents.

Among the countries and economies where the PISA sample covers less than 80% of the population of 15-year-olds (Coverage Index 3; see Chapter 6 for a detailed discussion), and that have comparable data for PISA 2009 and PISA 2015, the coverage of the PISA sample grew by more than 10 percentage points in Brazil, Colombia, Costa Rica, Indonesia and Turkey, and by about 8 percentage points in Uruguay (see Table I.6.1 and the related discussion in Chapter 6). Table I.4.4d shows that in Colombia and Uruguay, whose mean scores improved by 12 and 11 score points over this period, respectively, the level at which at least 50% of all 15-year-olds perform (adjusted median) improved even faster – by 61 and 38 score points, respectively. For Costa Rica, Figure I.4.3 shows a negative trend in mean performance; but the minimum level reached by at least 50% of all 15-year-olds was 47 score points higher in 2015 than in 2009.

Figure I.4.4 [Part 1/4] ■ Multiple comparisons of reading performance between 2009 and 2015

Comparison country/economy	Reading performance in PISA 2009	Reading performance in PISA 2015	Countries/economies with...		
			... similar performance in 2009 and in 2015	... similar performance in 2009, but higher performance in 2015	... similar performance in 2009, but lower performance in 2015
Singapore	526	535			Canada, Japan, New Zealand
Hong Kong (China)	533	527	Finland		Korea
Canada	524	527		Singapore	Japan, New Zealand
Finland	536	526	Hong Kong (China)		Korea
Ireland	496	521	Estonia		Norway, Germany, Poland, Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Estonia	501	519	Ireland, Norway		Germany, Poland, Netherlands, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Korea	539	517		Hong Kong (China), Finland	
Japan	520	516	New Zealand	Singapore, Canada	Netherlands, Australia
Norway	503	513	Estonia, Germany	Ireland	Poland, Netherlands, Sweden, France, Belgium, United States, Switzerland, Iceland
New Zealand	521	509	Japan	Singapore, Canada	Australia
Germany	497	509	Norway, Poland, Netherlands, Sweden	Ireland, Estonia	Denmark, France, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Macao (China)	487	509			Portugal, Latvia, Italy, Greece
Poland	500	506	Germany, Netherlands, Sweden, Denmark, France	Ireland, Estonia, Norway	Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary
Slovenia	483	505			Portugal, Spain, Latvia, Czech Republic, Italy, Greece
Netherlands	508	503	Germany, Poland, Australia, Sweden, Belgium, United States	Estonia, Japan, Norway	Switzerland, Iceland
Australia	515	503	Netherlands	Japan, New Zealand	
Sweden	497	500	Germany, Poland, Netherlands, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Norway	Iceland, Hungary
Denmark	495	500	Poland, Sweden, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Germany	Hungary
France	496	499	Poland, Sweden, Denmark, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Norway, Germany	Iceland, Hungary
Belgium	506	499	Netherlands, United States, Switzerland	Estonia, Norway, Poland	
Portugal	489	498	Sweden, Denmark, France, United Kingdom, Chinese Taipei	Ireland, Macao (China), Slovenia	Latvia, Italy, Hungary, Greece
United Kingdom	494	498	Sweden, Denmark, France, Portugal, Chinese Taipei, United States, Switzerland	Ireland, Estonia, Germany, Poland	Hungary
Chinese Taipei	495	497	Sweden, Denmark, France, Portugal, United Kingdom, United States, Switzerland	Ireland, Estonia, Germany, Poland	Iceland, Hungary
United States	500	497	Netherlands, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, Switzerland	Ireland, Estonia, Norway, Germany, Poland	Iceland, Hungary
Spain	481	496		Slovenia	Latvia, Czech Republic, Croatia, Italy, Israel, Greece, Slovak Republic

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown. Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Countries and economies are ranked in descending order of mean reading performance in 2015.

Source: OECD, PISA 2015 Database.


StatLink  <http://dx.doi.org/10.1787/888933432539>



Figure I.4.4 [Part 2/4] ■ Multiple comparisons of reading performance between 2009 and 2015

Countries/economies with...				Reading performance in PISA 2009	Reading performance in PISA 2015	Comparison country/economy
... higher performance in 2009, but similar performance in 2015	... higher performance in 2009, but lower performance in 2015	... lower performance in 2009, but similar performance in 2015	... lower performance in 2009, but higher performance in 2015			
	Hong Kong (China), Finland, Korea			526	535	Singapore
		Canada, Ireland	Singapore	533	527	Hong Kong (China)
Hong Kong (China), Finland	Korea	Ireland		524	527	Canada
		Canada, Ireland	Singapore	536	526	Finland
Hong Kong (China), Canada, Finland, Korea, Japan	New Zealand, Netherlands, Australia, Belgium			496	521	Ireland
Korea, Japan	New Zealand, Australia			501	519	Estonia
		Ireland, Estonia, Japan, Norway, New Zealand, Germany	Singapore, Canada	539	517	Korea
Korea		Ireland, Estonia, Norway, Germany		520	516	Japan
Korea, Japan, New Zealand	Australia	Macao (China)		503	513	Norway
Korea		Norway, Germany, Macao (China), Poland, Slovenia, Netherlands	Ireland, Estonia	521	509	New Zealand
Korea, Japan, New Zealand, Australia	Belgium	Macao (China), Slovenia		497	509	Germany
Norway, New Zealand, Germany, Poland	Netherlands, Australia, Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary	Slovenia		487	509	Macao (China)
New Zealand, Australia		Macao (China), Slovenia		500	506	Poland
New Zealand, Germany, Macao (China), Poland, Netherlands, Australia, Sweden, Denmark	France, Belgium, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland, Hungary			483	505	Slovenia
New Zealand		Slovenia, Denmark, France, Portugal, United Kingdom, Chinese Taipei	Ireland, Macao (China)	508	503	Netherlands
		Germany, Poland, Slovenia, Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States	Ireland, Estonia, Norway, Macao (China)	515	503	Australia
Australia, Belgium		Slovenia, Spain, Russia	Macao (China)	497	500	Sweden
Netherlands, Australia, Belgium	Iceland	Slovenia, Spain, Russia	Macao (China)	495	500	Denmark
Netherlands, Australia, Belgium		Spain, Russia	Macao (China), Slovenia	496	499	France
Australia		Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, Spain, Russia	Ireland, Germany, Macao (China), Slovenia	506	499	Belgium
Netherlands, Australia, Belgium, United States, Switzerland	Iceland	Spain, Russia		489	498	Portugal
Netherlands, Australia, Belgium	Iceland	Spain, Russia	Macao (China), Slovenia	494	498	United Kingdom
Netherlands, Australia, Belgium		Spain, Russia	Macao (China), Slovenia	495	497	Chinese Taipei
Australia		Portugal, Spain, Russia	Macao (China), Slovenia	500	497	United States
Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland	Iceland, Hungary	Russia		481	496	Spain

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown. Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. Countries and economies are ranked in descending order of mean reading performance in 2015.

Source: OECD, PISA 2015 Database.

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Figure I.4.4 [Part 3/4] ■ Multiple comparisons of reading performance between 2009 and 2015

Comparison country/economy	Reading performance in PISA 2009	Reading performance in PISA 2015	Countries/economies with...		
			... similar performance in 2009 and in 2015	... similar performance in 2009, but higher performance in 2015	... similar performance in 2009, but lower performance in 2015
Russia	459	495			Turkey
Switzerland	501	492	Sweden, Denmark, France, Belgium, United Kingdom, Chinese Taipei, United States	Ireland, Estonia, Norway, Germany, Poland, Netherlands	Iceland, Hungary
Latvia	484	488	Czech Republic, Italy	Macao (China), Slovenia, Portugal, Spain	Greece, Slovak Republic
Czech Republic	478	487	Latvia, Croatia, Luxembourg, Israel	Slovenia, Spain	Greece, Slovak Republic
Croatia	476	487	Czech Republic, Luxembourg, Israel	Spain	Lithuania, Greece, Slovak Republic
Italy	486	485	Latvia	Macao (China), Slovenia, Portugal, Spain	Greece
Iceland	500	482		Ireland, Estonia, Norway, Germany, Poland, Netherlands, Sweden, France, Chinese Taipei, United States, Switzerland	Hungary
Luxembourg	472	481	Czech Republic, Croatia, Israel		Lithuania, Slovak Republic
Israel	474	479	Czech Republic, Croatia, Luxembourg, Lithuania	Spain	Greece, Slovak Republic, Turkey
Lithuania	468	472	Israel	Croatia, Luxembourg	Turkey
Hungary	494	470		Ireland, Estonia, Germany, Poland, Sweden, Denmark, France, Portugal, United Kingdom, Chinese Taipei, United States, Switzerland, Iceland	
Greece	483	467		Macao (China), Slovenia, Portugal, Spain, Latvia, Czech Republic, Croatia, Italy, Israel	Slovak Republic
Chile	449	459			Costa Rica
Slovak Republic	477	453		Spain, Latvia, Czech Republic, Croatia, Luxembourg, Israel, Greece	
Malta	442	447			Bulgaria, Costa Rica
Uruguay	426	437	Romania, Bulgaria		Mexico, Thailand
Romania	424	434	Uruguay, Bulgaria, Trinidad and Tobago		Mexico, Thailand
Bulgaria	429	432	Uruguay, Romania, Costa Rica, Trinidad and Tobago, Mexico	Malta	Thailand
Turkey	464	428		Russia, Israel, Lithuania	
Costa Rica	443	427	Bulgaria	Chile, Malta	
Trinidad and Tobago	416	427	Romania, Bulgaria, Colombia		Thailand, Brazil
Montenegro	408	427	Colombia		Jordan, Brazil, Indonesia, Tunisia
Colombia	413	425	Trinidad and Tobago, Montenegro		Thailand, Jordan, Brazil
Mexico	425	423	Bulgaria	Uruguay, Romania	Thailand
Moldova	388	416			Albania
Thailand	421	409		Uruguay, Romania, Bulgaria, Trinidad and Tobago, Colombia, Mexico	
Jordan	405	408	Brazil	Montenegro, Colombia	Indonesia, Tunisia
Brazil	412	407	Jordan	Trinidad and Tobago, Montenegro, Colombia	
Albania	385	405		Moldova	
Qatar	372	402	Georgia, Peru		
Georgia	374	401	Qatar, Peru		
Peru	370	398	Qatar, Georgia		
Indonesia	402	397		Montenegro, Jordan	Tunisia
Tunisia	404	361		Montenegro, Jordan, Indonesia	

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown.

Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Countries and economies are ranked in descending order of mean reading performance in 2015.

Source: OECD, PISA 2015 Database.


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Figure I.4.4 [Part 4/4] ■ Multiple comparisons of reading performance between 2009 and 2015

Countries/economies with...				Reading performance in PISA 2009	Reading performance in PISA 2015	Comparison country/economy
... higher performance in 2009, but similar performance in 2015	... higher performance in 2009, but lower performance in 2015	... lower performance in 2009, but similar performance in 2015	... lower performance in 2009, but higher performance in 2015			
Sweden, Denmark, France, Belgium, Portugal, United Kingdom, Chinese Taipei, United States, Spain, Switzerland, Latvia, Czech Republic, Croatia	Italy, Iceland, Luxembourg, Israel, Lithuania, Hungary, Greece, Slovak Republic			459	495	Russia
		Portugal, Spain, Russia, Latvia, Czech Republic, Croatia, Italy	Macao (China), Slovenia	501	492	Switzerland
Switzerland	Iceland, Hungary	Russia, Croatia		484	488	Latvia
Switzerland, Italy, Iceland	Hungary	Russia		478	487	Czech Republic
Switzerland, Latvia, Italy, Iceland	Hungary	Russia		476	487	Croatia
Switzerland, Iceland	Hungary	Czech Republic, Croatia, Luxembourg, Israel	Russia	486	485	Italy
		Czech Republic, Croatia, Italy, Luxembourg, Israel	Macao (China), Slovenia, Denmark, Portugal, United Kingdom, Spain, Russia, Latvia	500	482	Iceland
Italy, Iceland	Hungary, Greece		Russia	472	481	Luxembourg
Italy, Iceland	Hungary		Russia	474	479	Israel
Hungary, Greece	Slovak Republic		Russia	468	472	Lithuania
		Lithuania, Greece	Macao (China), Slovenia, Spain, Russia, Latvia, Czech Republic, Croatia, Italy, Luxembourg, Israel	494	470	Hungary
Hungary		Lithuania, Chile	Russia, Luxembourg	483	467	Greece
Greece, Slovak Republic	Turkey			449	459	Chile
		Chile, Malta	Russia, Lithuania	477	453	Slovak Republic
Slovak Republic	Turkey			442	447	Malta
Turkey	Costa Rica			426	437	Uruguay
Turkey, Costa Rica		Montenegro, Colombia		424	434	Romania
Turkey		Montenegro, Colombia		429	432	Bulgaria
		Uruguay, Romania, Bulgaria, Costa Rica, Trinidad and Tobago, Montenegro, Colombia, Mexico	Chile, Malta	464	428	Turkey
Turkey		Romania, Trinidad and Tobago, Montenegro, Colombia, Mexico	Uruguay	443	427	Costa Rica
Turkey, Costa Rica, Mexico		Montenegro		416	427	Trinidad and Tobago
Romania, Bulgaria, Turkey, Costa Rica, Trinidad and Tobago, Mexico	Thailand			408	427	Montenegro
Romania, Bulgaria, Turkey, Costa Rica, Mexico				413	425	Colombia
Turkey, Costa Rica		Trinidad and Tobago, Montenegro, Colombia, Moldova		425	423	Mexico
Mexico, Thailand	Jordan, Brazil, Indonesia, Tunisia			388	416	Moldova
		Moldova, Jordan, Brazil, Albania, Georgia	Montenegro	421	409	Thailand
Thailand		Albania, Georgia	Moldova	405	408	Jordan
Thailand		Albania, Qatar, Georgia	Moldova	412	407	Brazil
Thailand, Jordan, Brazil, Indonesia	Tunisia	Qatar, Georgia, Peru		385	405	Albania
Brazil, Albania, Indonesia	Tunisia			372	402	Qatar
Thailand, Jordan, Brazil, Albania, Indonesia	Tunisia			374	401	Georgia
Albania, Indonesia	Tunisia			370	398	Peru
		Albania, Qatar, Georgia, Peru	Moldova	402	397	Indonesia
			Moldova, Albania, Qatar, Georgia, Peru	404	361	Tunisia

Notes: Only countries and economies with valid results from the PISA 2009 and PISA 2015 assessments are shown. Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. Countries and economies are ranked in descending order of mean reading performance in 2015.

Source: OECD, PISA 2015 Database.

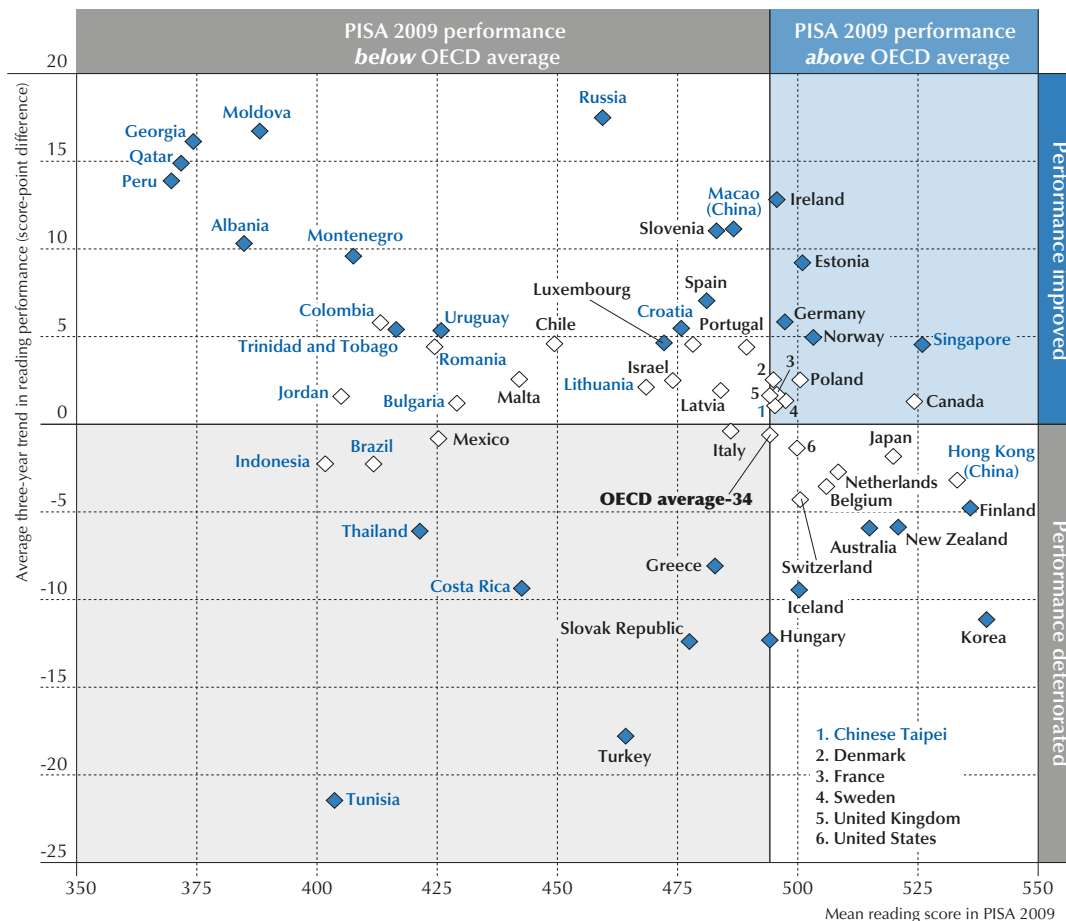
StatLink  <http://dx.doi.org/10.1787/888933432539>



Similarly, for Brazil, Figure I.4.3 shows a non-significant trend, but the adjusted median increased by 13 score points, on average, every three years. And in Turkey, the negative trend reported in Figure I.4.3 does not necessarily correspond to a decline in the level reached by those students who would have been in school, in grade 7 or above, even in 2009; instead, it most likely reflects the expansion of secondary education between 2009 and 2015 to include more students from disadvantaged backgrounds. The adjusted median shows no significant change for Turkey.

Table I.4.4e presents an estimate of the change in mean performance between PISA 2015 and prior assessments that would have been observed had the proportion of students with an immigrant background, the share of girls and the age distribution of students in the PISA sample stayed constant across all assessments. In some countries, the demographics of the student population have changed considerably in recent years. In these countries, the adjusted trends may differ significantly from those reported in previous sections. If countries and economies see a more negative trend than the adjusted trend reported here, that means that changes in the student population are having adverse effects on performance. Conversely, if a country's observed trend is more positive than the adjusted trend discussed here, that means that changes in the student population contribute to improvements in the mean level of performance.

Figure I.4.5 ■ **Relationship between average three-year trend in reading performance and average PISA 2009 reading scores**



Notes: Average three-year trends in reading that are statistically significant are indicated in a darker tone (see Annex A3).

The average three-year trend is the average rate of change, per three-year period, between the earliest available measurement in PISA and PISA 2015. For countries and economies with more than one available measurement, the average three-year trend is calculated with a linear regression model. This model takes into account that Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

The correlation between a country's/economy's mean score in 2009 and its average three-year trend is -0.3.

Only countries and economies with available data since 2009 are shown.

Source: OECD, PISA 2015 Database, Table I.4.4a.

StatLink <http://dx.doi.org/10.1787/888933432541>



While the observed levels of performance measure the overall quality of education in a school system, comparing the observed trends with the hypothetical, adjusted trends can highlight the challenges that countries and economies face in improving students' and schools' performance in reading.

For countries where the demographic makeup of the student population changed little, adjusted changes in mean scores for this period closely track observed changes. The largest differences between adjusted and observed trends are found in Qatar and Sweden. For Sweden, both the observed trend and the adjusted trend are not significant (observed: +1 point every three years; adjusted: +5 points), but the comparison highlights the challenge faced by Sweden to accommodate the growth in the immigrant population. The reverse is found for Qatar. There, the observed trend is larger (a 15-point increase every three years) than the adjusted trend (9 points), indicating that changes in the student population in Qatar contributed to improvements in the mean level of performance (Tables I.4.4a and I.4.4e).

Long-term trends in reading since PISA 2000

The students who sat the PISA test in 2015 were only just born when the first PISA test was conducted in 2000. Four more cohorts of students sat the PISA test in the meantime, in three-year intervals. In contrast to science and mathematics results, the results of all six PISA reading assessments since 2000 have consistently been reported on the same scale, making it possible to compare results and compute trends over 15 years.³ Over such a long period, not just education systems, but societies and economies as a whole have changed considerably.

In 2000, only 26% of the population, on average across OECD countries, used the Internet; in 2015, more than 80% did (International Telecommunication Union, 2016). New technologies, as well as greater international trade and competition, have arguably increased the minimum level of competence in reading required to fully participate in work and society. Meanwhile, across OECD countries, expenditure per primary and secondary student rose by almost 20% between 2005 and 2013 (OECD, 2016b). Yet, on average across OECD countries with comparable results across all six PISA assessments since 2000, students' mean reading proficiency has remained flat (I.4.4a). Greater demand for reading skills and greater investment in education have not (yet) been followed by improvements in students' results, on average across countries.

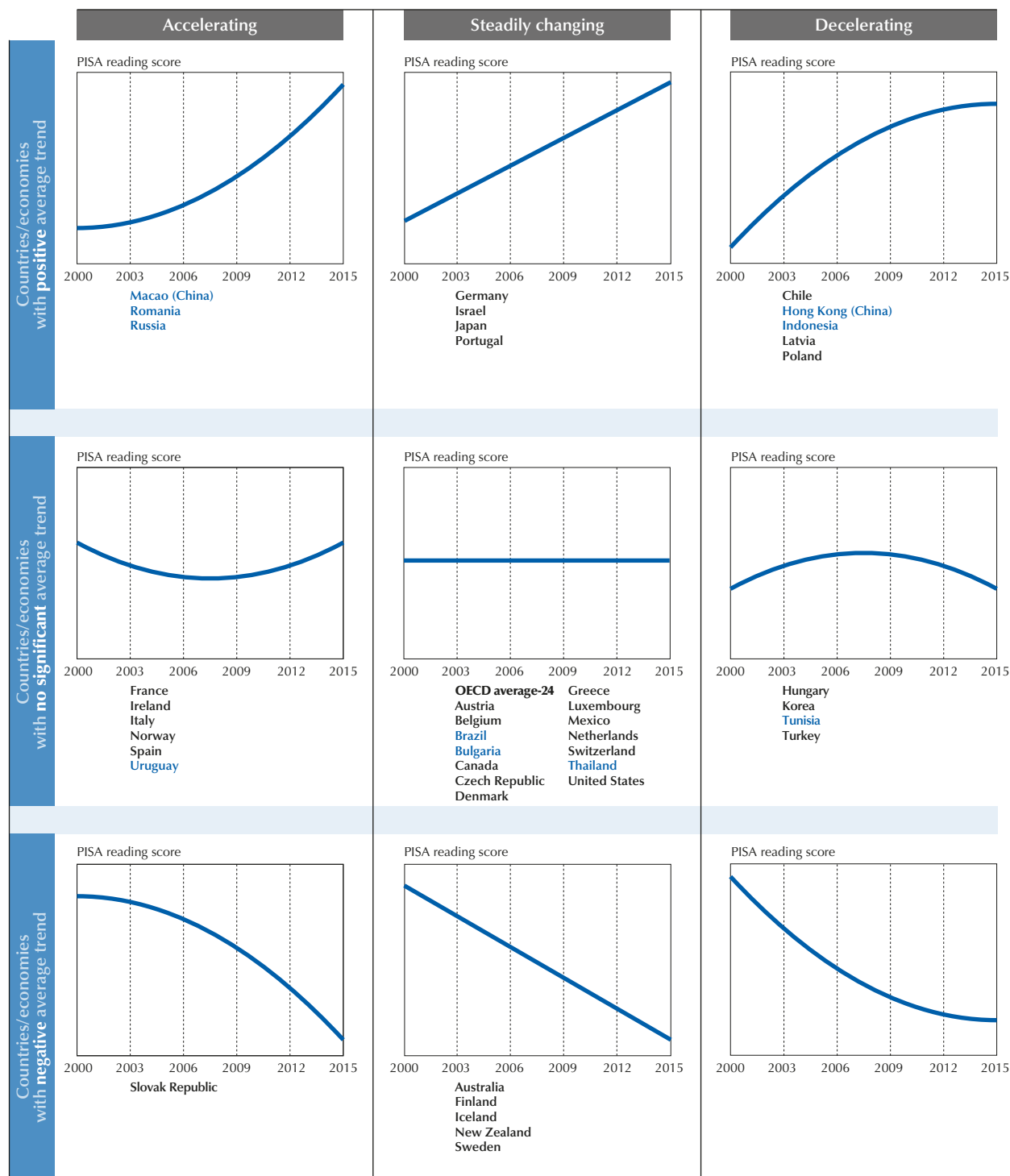
Twenty-nine countries/economies can compare trends across all six PISA assessments since PISA 2000. Thirteen more countries/economies have collected comparable data on student performance in at least five PISA assessments, including 2015. This section focuses on the trajectory of mean reading performance in these 42 countries/economies.

Average improvements in reading performance over successive PISA assessments, spanning at least five consecutive assessments (or 12 years), have been observed in Chile, Germany, Hong Kong (China), Indonesia, Israel, Japan, Latvia, Macao (China), Poland, Portugal, Romania and Russia. Chile, Israel and Russia saw an average improvement of between eight and ten points every three years; the remaining nine countries and economies saw improvements of between three and six points per three-year period. Twenty-four other countries saw no significant improvement or deterioration of performance, on average across successive assessments, between PISA 2000 (or 2003, for countries without data from PISA 2000) and PISA 2015. Six countries (Australia, Finland, Iceland, New Zealand, the Slovak Republic and Sweden) saw a significant negative trend, with performance deteriorating on average between three and six points every three years, between PISA 2000 (or 2003 for the Slovak Republic) and PISA 2015 (Table I.4.4a).

But over a decade and a half, not all trajectories have been linear. The average trend observed over successive PISA assessments does not capture the extent to which this trend corresponds to a steady change, or to a decelerating or accelerating improvement or deterioration in performance. Even countries with no significant average trend may have seen a temporary slump in performance followed by a recovery, or a temporary improvement, followed by a return to prior levels of performance.

Figure I.4.6 categorises countries and economies into nine groups. Countries with an average improvement across at least five PISA assessment since PISA 2000 or 2003 are in the top row; countries with no significant positive or negative trend are in the middle row; and countries with a negative trend are in the bottom row. The column indicates whether the trend observed is a steady trend (middle column), or whether it is an accelerating (left) or decelerating (right) trend. (For countries with no significant trend overall, an accelerating trend indicates that the most recent trend is positive, a decelerating trend that the most recent trend is negative.)

Figure I.4.6 ■ **Curvilinear trajectories of average reading performance across PISA assessments**
Rate of acceleration or deceleration in performance (quadratic term)



Notes: Figures are for illustrative purposes only. Countries and economies are grouped according to the direction and significance of their average three-year trend and of their rate of acceleration (quadratic term).

Only countries and economies with data from five or six PISA assessments since PISA 2000 are included. OECD average-24 refers to the average of all OECD countries with valid data in all six assessments: Austria, Chile, Estonia, Israel, Luxembourg, the Netherlands, the Slovak republic, Slovenia, Turkey, the United Kingdom and the United States are not included in this average.

Source: OECD, PISA 2015 Database, Table I.4.4a.

StatLink <http://dx.doi.org/10.1787/888933432552>



Non-linear trend trajectories are estimated using a regression model, by fitting a quadratic function to the five or six mean estimates available, and taking into account the statistical uncertainty associated with each estimate as well as with comparisons across time. This is a more robust measure of a country's/economy's trajectory than the comparison of mean scores across consecutive assessments because it is less sensitive to one-time statistical fluctuations that may alter a country's/economy's mean performance estimate.

Figure I.4.6 shows that among the countries with an average improvement in performance, Macao (China), Romania and Russia show an accelerating improvement, meaning that the rate of change in performance observed over the most recent PISA assessments is faster than in the earlier assessments. In these three countries/economies, performance only really began to improve around 2006 or 2009, and improved rapidly ever since. Chile, Hong Kong (China), Indonesia, Latvia and Poland, in contrast, show decelerating improvements over the period: their gains in performance were faster over earlier assessments than in the most recent tests (in Hong Kong [China]), the most recent trajectory is significantly negative). Germany, Israel, Japan and Portugal show relatively steady improvements over the whole period. In Israel, mean performance improved from 452 score points in 2002 (when the country first participated in PISA, as part of the PISA 2000+ cohort) to 474 points in 2009 (when reading was again the major domain) and to 479 points in 2015. In Portugal, mean performance improved from 470 score points in PISA 2000, to 489 points in PISA 2009 and to 498 points in PISA 2015. Similarly, in Germany, mean performance improved from 484 score points in PISA 2000 to 497 points (or about the OECD average) in PISA 2009 and to 509 points (well above the OECD average) in PISA 2015.

Hong Kong (China) and Japan also show an average positive trend, even though the simple score difference between PISA 2000 and PISA 2015 for these countries is not significant, and close to zero. This is because the trend is estimated by taking all six available data points into account, through a linear regression model, and corresponds to the average change across successive assessments. Both Hong Kong (China) and Japan scored significantly lower in reading in PISA 2003 than in PISA 2000 (which was conducted in 2002 in Hong Kong [China]), perhaps reflecting changes in design and coverage of the reading assessment (see note 3 at the end of this chapter and Annex A5). But Japan showed relatively steady improvement ever since; and while the linear trend for Hong Kong (China) remains positive, the curvilinear trajectory indicates that the trend slowed down and reversed in recent years.

Other countries and economies show no average positive or negative trend, but this is because of a deterioration in the earlier PISA assessments followed by improvements in later assessments. This pattern is observed in France, Ireland, Italy, Norway, Spain and Uruguay. In Spain, for example, reading scores fell from 493 score points in PISA 2000 to 481 points in 2009; but this initially negative trend reversed itself in more recent years, and mean performance in 2015, at 496 points, returned again to a level close to the OECD average.

Some countries and economies do not show significant improvements or deterioration over time; their performance has remained stable over at least five PISA assessments. In Canada, in particular, reading scores have remained at least 20 points above the OECD average in all six PISA assessments – a remarkable achievement.

STUDENTS AT THE DIFFERENT LEVELS OF READING PROFICIENCY

The seven proficiency levels used in the PISA 2015 reading assessment are the same as those established for the 2009 PISA assessment, when reading was the main domain assessed: Level 1b is the lowest described level, then Level 1a, Level 2, Level 3 and so on up to Level 6. Figure I.4.7 provides details of the nature of the reading skills, knowledge and understanding required at each level of the reading scale. The required skills at each proficiency level are described according to the three processes that students use to answer the questions. These three processes are defined in the framework as “access and retrieve” (skills associated with finding, selecting and collecting information), “integrate and interpret” (processing what is read to make sense of a text), and “reflect and evaluate” (drawing on knowledge, ideas or values external to the text).

Since it is necessary to preserve the confidentiality of the test material in order to continue to monitor trends in reading beyond 2015, no question used in the PISA 2015 assessment was released after the assessment. However, because PISA 2015 used questions from previous assessments, it is possible to illustrate the proficiency levels with the test materials that were released after previous assessments. Example items to illustrate the different levels of reading proficiency can be found in the PISA 2009 and PISA 2012 initial reports (OECD, 2014; OECD, 2010c) and on line at <http://www.oecd.org/pisa>.



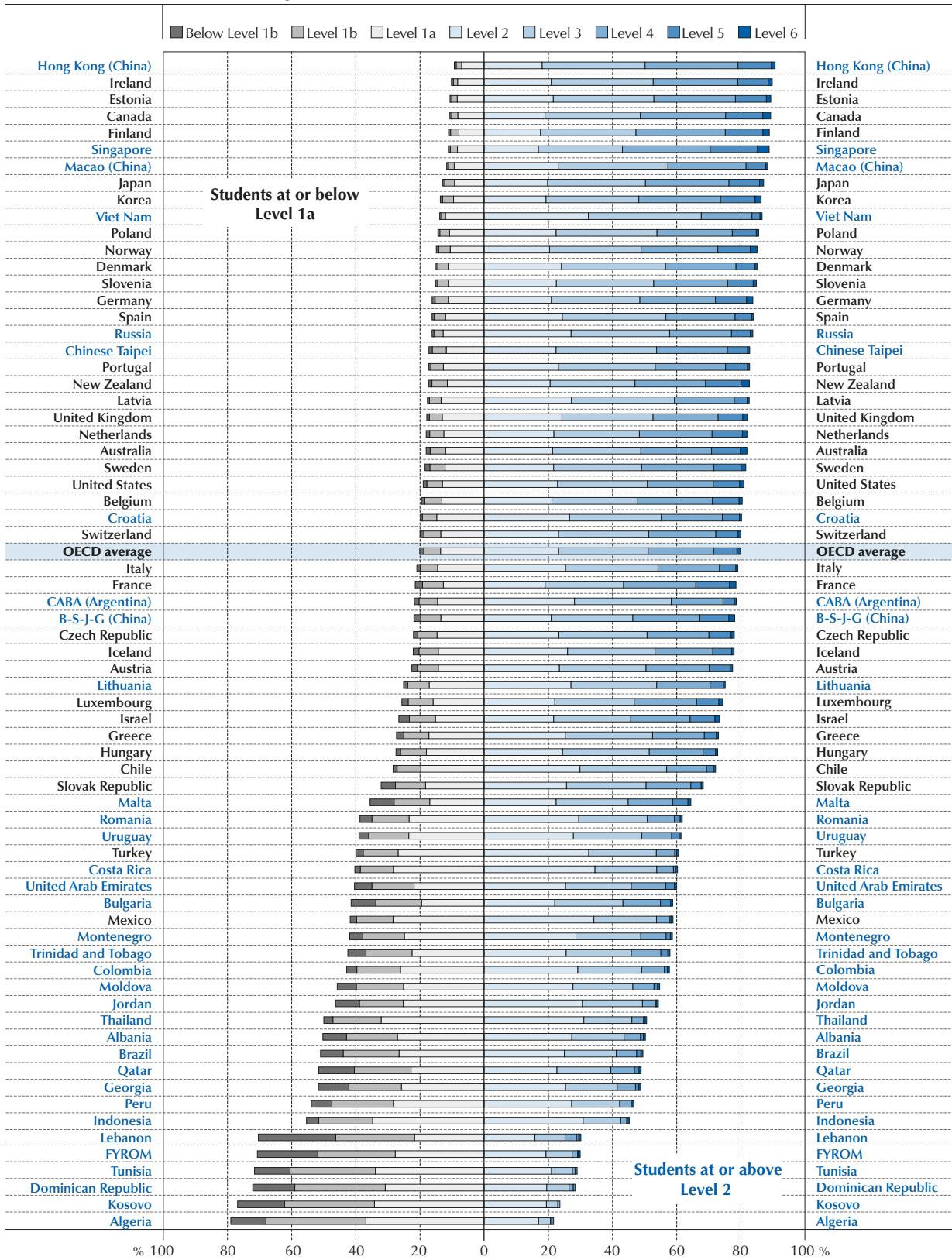
Figure I.4.8 shows the distribution of students across the seven proficiency levels in each participating country and economy. Table I.4.1a shows the percentage of students at each proficiency level on the reading scale, with standard errors.

Figure I.4.7 ■ **Summary description of the seven levels of reading proficiency in PISA 2015**

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



Figure I.4.8 ■ Students' proficiency in reading



Countries and economies are ranked in descending order of the percentage of students who perform at or above Level 2.

Source: OECD, PISA 2015 Database, Table I.4.1a.

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Proficiency above the baseline

Proficiency at Level 2 (score higher than 407 but lower than 480 points)

Level 2 can be considered a baseline level of proficiency at which students begin to demonstrate the reading skills that will enable them to participate effectively and productively in life. The 2009 Canadian Youth in Transition Survey, which followed up on students who were assessed by PISA in 2000, shows that students scoring below Level 2 in reading face a disproportionately higher risk of not participating in post-secondary education and of poor labour-market outcomes at age 19, and even more so at age 21 (OECD, 2010a).

Some tasks at Level 2 require the student to retrieve one or more pieces of information that may have to be inferred and may have to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or interpreting meaning within a limited part of the text when the information is not prominent and the student must make low-level inferences. Tasks at this level may involve integrating parts of the text through comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require the student to make a comparison or several connections between the text and outside knowledge by drawing on personal experience and attitudes.

On average across OECD countries, 80% of students are proficient at Level 2 or higher. In Hong Kong (China), more than 90% of students perform at or above this threshold. In Canada, Denmark, Estonia, Finland, Ireland, Japan, Korea, Macao (China), Norway, Poland, Singapore and Viet Nam, between 85% and 90% of students achieve the baseline level of reading proficiency. In 16 participating countries/economies, between 80% and 85% of students do, and in 7 more countries, more than 75% do. In 7 OECD countries (Chile, Greece, Hungary, Israel, Luxembourg, the Slovak Republic and Turkey), between one in four (25%) and one in two (50%) students performs below Level 2. In all other OECD countries, at least three out of four students perform at Level 2 or above (Figure I.4.8 and Table I.4.1a).

In some middle- and low-income countries, fewer than one in two students reaches a baseline level in reading. In Algeria and Kosovo, fewer than one in four students scores at or above the baseline level; in the Dominican Republic, FYROM, Lebanon and Tunisia, only between 25% and 30% of students attain this level or higher, as do between 40% and 50% of students in Albania, Brazil, Georgia, Indonesia, Peru and Qatar. These countries are still far from the objective of equipping all students with the minimum level of reading skills that enables further learning and participation in knowledge-based societies.

At the same time, in many middle- and low-income countries, not all 15-year-olds are eligible to participate in PISA because these young people have dropped out of school, never attended school, or are in school, but in grade 6 or below (see Chapter 6). Assuming that these 15-year-olds would not reach Level 2 if they sat the PISA reading test, and based on the estimated total number of 15-year-olds in each country/economy, it is possible to estimate a lower bound for the proportion of all 15-year-olds who attain the baseline level of performance in reading.⁴

Table I.4.1b shows that in 23 countries and economies, including 2 OECD countries (Mexico and Turkey) and 2 countries/economies whose mean performance in reading is close to the OECD average (B-S-J-G [China] and Viet Nam), fewer than one in two 15-year-olds is in school, in grade 7 or above, and proficient in reading at Level 2 or above. In Viet Nam, 86% of students who are in the PISA target population attain Level 2, as do 78% of students in B-S-J-G (China); but the PISA target population represents less than 50% of the total population of 15-year-olds in Viet Nam, and only 64% in B-S-J-G (China). To meet the target of basic skills for all, Viet Nam and B-S-J-G (China) should expand access to secondary education to include all 15-year-olds, while keeping the quality of education high – so that those who are not currently in school can also acquire the skills and knowledge that those in school learn.

Meanwhile, in Brazil, Costa Rica, Lebanon and Mexico, fewer than two in three 15-year-olds are eligible to participate in PISA and are represented by the PISA sample; but among those who sat the PISA test in 2015, more than 40% did not reach the baseline level in reading. These countries face a double challenge to expand secondary education while also ensuring that students are at least able to read and understand texts at a level that enables them to develop their potential and participate in knowledge-based societies (Tables I.4.1a, I.4.1b and I.6.1).

Proficiency at Level 3 (score higher than 480 but lower than 553 points)

Tasks at Level 3 require the student to retrieve, and in some cases recognise the relationship among, several pieces of information that must meet multiple conditions. Interpreting tasks at this level requires the student 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. The student needs to take into account many features in comparing, contrasting or categorising. Often the required



information is not prominent or there is much competing information; or there are other obstacles in the text, such as ideas that are contrary to expectations or negatively worded. Reflective tasks at this level may require connections, comparisons and explanations, or they may require the student to evaluate a feature of the text. Some reflective tasks require the student to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but ask the student to draw on less common knowledge.

Across OECD countries, 57% of students are proficient at Level 3 or higher (that is, proficient at Level 3, 4, 5 or 6). In Canada, Finland, Hong Kong (China) and Singapore, more than 70% of students are proficient at Level 3 or higher, and at least two out of three students attain this level in Estonia, Ireland, Japan and Korea. In contrast, in 14 countries and economies (Albania, Algeria, Brazil, the Dominican Republic, FYROM, Georgia, Indonesia, Jordan, Kosovo, Lebanon, Mexico, Peru, Thailand and Tunisia), three out of four students do not attain this level (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 4 (score higher than 553 but lower than 626 points)

Tasks at Level 4 that involve retrieving information require the student to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require the student to use formal or public knowledge to hypothesise about or critically evaluate a text. The student must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.

On average across OECD countries, 29% of students are proficient at Level 4 or higher (that is, proficient at Level 4, 5 or 6). In Canada, Finland, Hong Kong (China) and Singapore, between 40% and 46% of students attain these levels. However, in the partner countries Algeria, Kosovo and Tunisia, less than 1% of students attains at least this level (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 5 (score higher than 626 but lower than 698 points)

Tasks at Level 5 that involve retrieving information require the student to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypotheses, drawing on specialised knowledge. Both interpreting and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.

Across OECD countries, 8.3% of students are top performers, meaning that they are proficient at Level 5 or 6. Singapore has the largest proportion of top performers – 18.4% – among all participating countries and economies. About 14% of students in Canada, Finland and New Zealand, and 13% in France and Korea are top performers in reading. Overall, in 15 countries and economies, more than 10% of students are top performers, in 21 countries/economies between 5% and 10% of students are top performers, in 19 countries/economies, between 1% and 5% of students attain this level of performance, and in 15 countries/economies – including OECD countries Mexico and Turkey – less than 1% of students performs at Level 5 or above (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 6 (score higher than 698 points)

Tasks at Level 6 typically require the student 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 student to deal with unfamiliar ideas in the presence of prominent competing information, and generate abstract categories for interpretations. “Reflect and evaluate” tasks may require the student to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understanding from beyond the text. “Access and retrieve” tasks at this level require precise analysis and fine attention to detail that is inconspicuous in the texts.

Across OECD countries, only 1.1% of students perform at Level 6 in reading, but the proportion varies somewhat across countries. More than 1 in 50 students perform at this level in Singapore (3.6%), New Zealand (2.6%), Canada (2.4%) and Norway (2.1%). In Australia, Finland and France, 2.0% of students (or about 1 in 50) attain proficiency Level 6, as do 1.9% of students in Germany and Korea and 1.8% in B-S-J-G (China). By contrast, in Algeria, the Dominican Republic, Kosovo and Tunisia, fewer than 1 in 1 000 students (0.1%) performs at Level 6 (Figure I.4.8 and Table I.4.1a).



Proficiency below the baseline

PISA distinguishes two levels of reading proficiency below Level 2. Level 1a corresponds to scores higher than 335 but lower than 407 points; and Level 1b corresponds to a range of scores below Level 1a, between 262 and 335 score points.

Proficiency at Level 1a (score higher than 335 but lower than 407 points)

Tasks at Level 1a require the student to retrieve one or more independent pieces of explicitly stated information, interpret the main theme or author's intent in a text about a familiar topic, or make a simple connection by reflecting on the relationship between information in the text and common, everyday knowledge. The required information in the text is usually prominent and there is little, if any, competing information. The student is explicitly directed to consider relevant factors in the task and in the text.

Across OECD countries, an average of 14% of students can solve tasks located at Level 1a, but cannot solve tasks located above this level. Some 6.5% of students do not even attain Level 1a. In Algeria, Brazil, the Dominican Republic, FYROM, Georgia, Indonesia, Kosovo, Peru, Qatar, Thailand and Tunisia, Level 1a is the modal proficiency level of students, meaning that a greater share of students performs at Level 1a than at any other proficiency level in PISA (Figure I.4.8 and Table I.4.1a).

Proficiency at Level 1b (score higher than 262 but lower than 335 points)

Level 1b is the lowest described level of proficiency in PISA, corresponding to some of the easiest tasks included in the assessment. Tasks at Level 1b require the student to retrieve 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 student, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation, the student may need to make simple connections between adjacent pieces of information. Students with scores below 262 points – that is, below Level 1b – usually do not succeed at the most basic reading tasks that PISA measures. This does not necessarily mean that they are illiterate, but that there is insufficient information on which to base a description of their reading proficiency.

Across OECD countries, 5.2% of students are only able to solve tasks at Level 1b, and 1.3% of students are not even proficient at this level. In some countries, however, very few students have such poor reading skills. In Ireland and Viet Nam, more than 98% of students perform above Level 1b (but 51% of all 15-year-olds in Viet Nam are not eligible to participate in PISA). Similarly, in Canada, Estonia, Hong Kong (China), Macao (China) and Singapore, few students (between 2% and 3%) perform at Level 1b or below.

In contrast, almost one in two students in Lebanon performs below Level 1a – and half of them (24%) score below Level 1b. More than 40% of students in Algeria, the Dominican Republic, FYROM and Kosovo, and 38% of students in Tunisia, are not able to reach Level 1a. In these countries, most of these students perform at Level 1b (Figure I.4.8 and Table I.4.1a).

Trends in the percentage of low performers and top performers in reading

PISA assesses the reading skills required for students to participate fully in a knowledge-based society. These range from the baseline skills that are considered to be the minimum required for functioning in society to the complex skills that only a few students have mastered. The proportion of students who do not meet the baseline proficiency (Level 2; low-performing students) and the proportion of students who are able to understand and communicate complex tasks (Level 5 or 6; top-performing students) are important indicators of the needs and challenges faced by each country/economy and benchmarks of the level of skills development in that country/economy.

Changes in a country's/economy's average performance can result from improvements in or the deterioration of performance at different points in the performance distribution. For example, in some countries/economies, average improvement is observed among all students, resulting in fewer students who perform below Level 2 and more students who are top performers. In other contexts, average improvement can mostly be attributed to large improvements among low-achieving students with little or no change among high-achieving students. This may result in a smaller proportion of low-performing students, but no increase among top performers. Trends in the proportion of low- and top-performing students indicate where the changes in performance have occurred, and the extent to which school systems are advancing towards providing all students with basic literacy skills and towards producing a larger proportion of students with the highest skills in reading. On average across OECD countries with comparable data, between 2009 and 2015 there was no significant change in the share of students who do not attain the baseline level of proficiency in reading, nor in the share of students who score at or above proficiency Level 5 (Figure I.4.9 and Table I.4.2a).



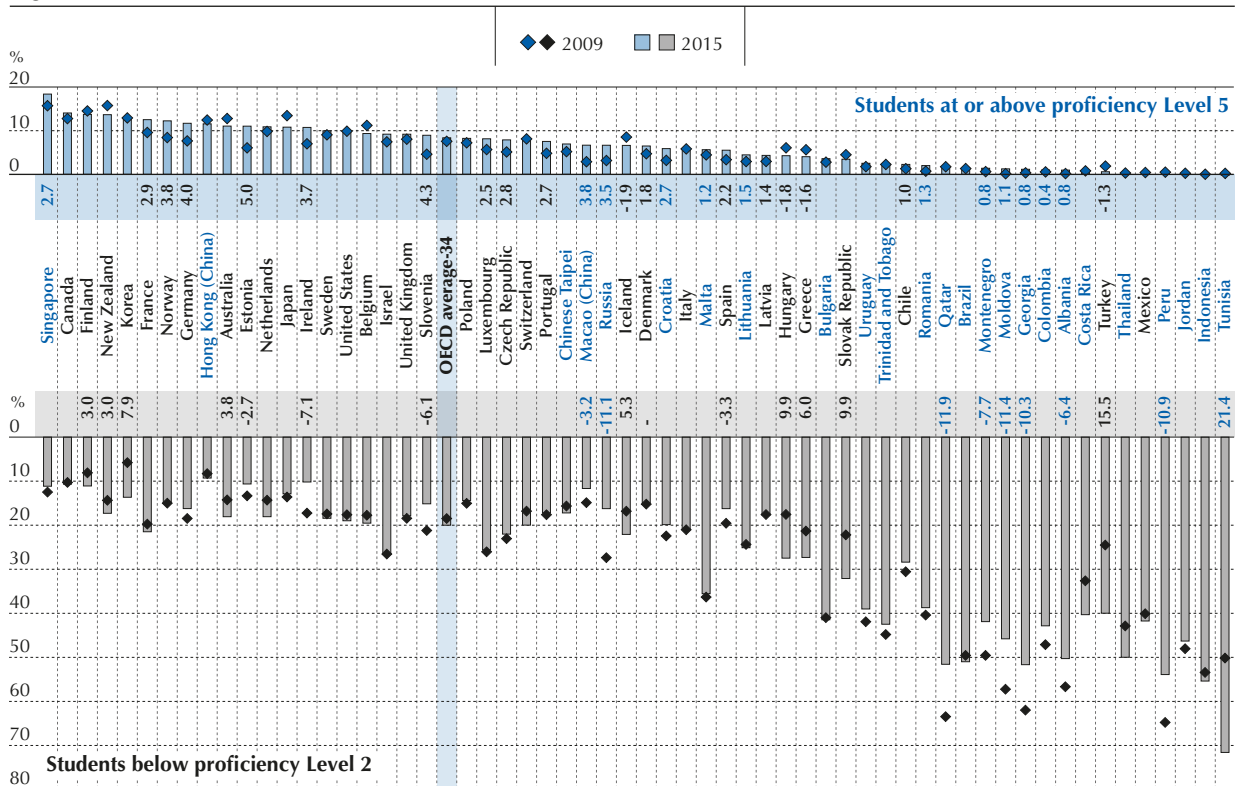
Countries and economies can be grouped into categories according to whether, between PISA 2009 and PISA 2015, they have: simultaneously reduced the share of low performers and increased the share of top performers in reading; reduced the share of low performers but not increased the share of top performers; increased the share of top performers but not reduced the share of low performers; and reduced the share of top performers or increased the share of low performers. The following section categorises countries and economies into these groups. But most countries/economies are not included in any of these groups; they had no significant change in the percentage of top performers or in the percentage of low performers.

Moving everyone up: Reduction in the share of low performers and increase in that of top performers

Between PISA 2009 and PISA 2015, Albania, Estonia, Georgia, Ireland, Macao (China), Moldova, Montenegro, Russia, Slovenia and Spain saw an increase in the share of students who attain the highest proficiency levels in PISA and a simultaneous decrease in the share of students who do not attain the baseline level of proficiency. In Slovenia, for example, the share of students performing below Level 2 shrank by six percentage points (from 21% to 15%) between 2009 and 2015, while the share of students performing at or above proficiency Level 5 grew by four percentage points (from 5% to 9%) (Figure I.4.9 and Table I.4.2a). The system-wide improvements observed in these countries and economies have lifted students out of low performance and others into top performance.

For many of these countries and economies, these changes in the share of low and top performers mirror average trends in student performance at different levels of the performance distribution since 2009. Table I.4.4b shows how, for each country and economy, the 10th, 25th, 75th and 90th percentiles of performance have evolved across different PISA cycles.

Figure I.4.9 ■ Percentage of low-achieving students and top performers in reading in 2009 and 2015



Notes: Only countries/economies that participated in both 2009 and 2015 PISA assessments are shown. The change between PISA 2009 and PISA 2015 in the share of students performing below Level 2 in reading is shown below the country/economy name. The change between PISA 2009 and PISA 2015 in the share of students performing at or above Level 5 in reading is shown above the country/economy name. Only statistically significant changes are shown (see Annex A3). Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+.

Countries and economies are ranked in descending order of the percentage of students performing at or above Level 5 in 2015.

Source: OECD, PISA 2015 Database, Table I.4.2a.

StatLink <http://dx.doi.org/10.1787/888933432570>



Consistent with trends in the share of low- and top-performing students, the table shows that in Albania, Georgia, Ireland, Macao (China), Moldova, Montenegro, Russia, Slovenia and Spain, an average improvement in performance between 2009 and 2015 can be observed at all levels of the distribution – among the lowest-achieving students (those whose performance is around the 10th and 25th percentiles of performance), among those whose score around the median, and among the highest-achieving students (those whose performance is around the 75th and 90th percentiles). Peru and Qatar also moved towards higher performance across the board during the same period. But in these countries, more than one in two students still perform below Level 2 – a clear sign that much remains to be done to equip all students with the baseline skills needed for full participation in society and the economy. By international benchmarks, these countries belong to the next category (“reducing underperformance”).

Reducing underperformance: Reductions in the share of low performers but no change in that of top performers

Peru and Qatar have reduced the share of students performing below Level 2 in reading, without seeing a concurrent increase in the share of students who reach the highest levels of proficiency (Figure I.4.9 and Table I.4.4b).

Tables I.4.4b and I.4.4c show that in Peru and Qatar, the improvement in the minimum proficiency achieved by at least 90% of its students (10th percentile) was larger than the improvement at the top (90th percentile), so that the distance between the highest- and lowest-performing students narrowed significantly. The interdecile range, or the distance between the 10th and the 90th percentile of performance, also narrowed in Ireland and in Trinidad and Tobago as a result of improvements in performance among these countries’ lowest-achieving students. In these two countries, there was no significant concurrent improvement among the highest-performing students (90th percentile).

Nurturing top performance: Increase in the share of top performers but no change in that of low performers

Fourteen countries and economies (Chile, Croatia, the Czech Republic, Denmark, France, Germany, Latvia, Lithuania, Luxembourg, Malta, Norway, Portugal, Romania and Singapore) saw growth in the share of top-performing students in reading since PISA 2009 with no concurrent reduction in the share of low-performing students. Germany and Norway, for example, saw increases of four percentage points in the share of students performing at or above Level 5 (from 8% to 12%), while that share increased by 3 percentage points in France (from 10% to 13%). This trend is also observed in Brazil since PISA 2012 (Figure I.4.9 and Table I.4.2a). These countries and economies have been able to increase the share of students who attain the highest scores in reading.

Table I.4.4b shows that in Chile, the Czech Republic, Estonia, France, Latvia, Lithuania, Luxembourg, Norway and Portugal, significant improvements in performance were concentrated among the highest-achieving students. These countries/economies saw the gap between the two extremes in performance widen because the minimum level achieved by the 10% highest-performing students (90th percentile) improved, while performance among the lowest achievers (10th percentile) remained stable (Table I.4.4c). The gap also widened in Macao (China) and Moldova, where there was a significant improvement at the 10th percentile, but an even larger, simultaneous improvement at the 90th percentile.

Increase in the share of low performers and/or decrease in that of top performers

By contrast, in some countries and economies, the percentage of students who do not attain the PISA baseline level of proficiency in reading increased since 2009. An increase in the share of low-achieving students is observed in Australia, Finland, Greece, Hungary, Iceland, Korea, New Zealand, the Slovak Republic, Tunisia and Turkey. In Greece, Hungary, Iceland and Turkey, the share of students who perform at the highest levels of proficiency (Level 5 and above) shrank over the same period (Figure I.4.9 and Table I.4.4b).

Table I.4.4b shows that in Costa Rica, Greece, Hungary, Iceland, the Slovak Republic, Tunisia and Turkey, performance deteriorated, on average, between PISA 2009 and PISA 2015, at all levels of the performance distribution, i.e. among these countries’ highest-achieving students as well as among students who scored around the median and among the lowest-achieving students. In Hungary and the Slovak Republic, performance declined more at the bottom of the performance distribution than at the top; as a result, these countries have observed widening gaps between their highest- and lowest-achieving students.

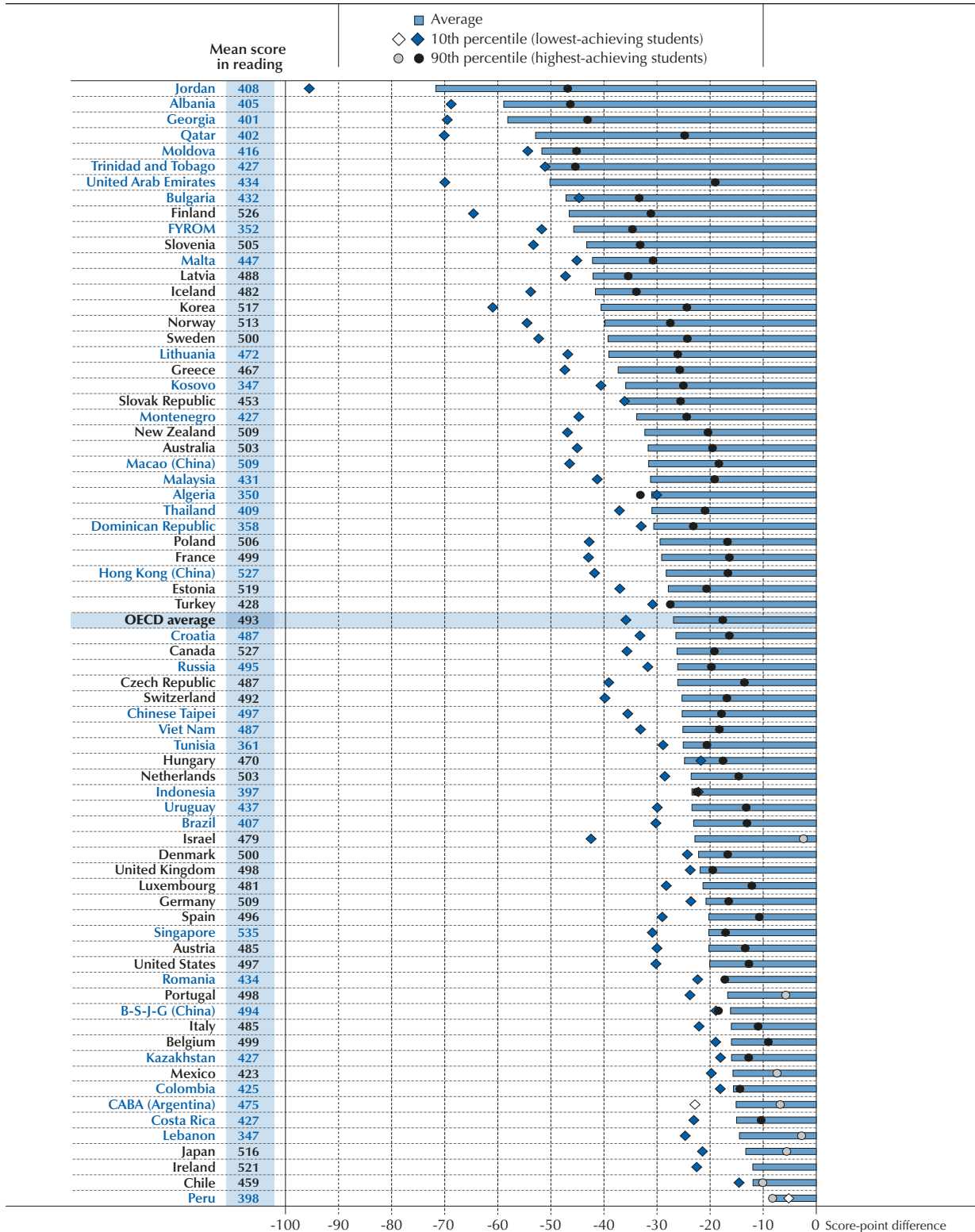
GENDER DIFFERENCES IN READING PERFORMANCE

PISA has consistently found that, across all countries and economies, girls outperform boys in reading (OECD, 2014).

In 2015, on average across OECD countries, girls outperform boys in reading by 27 score points. While girls outperform boys in reading in every participating country and economy, the gap is much wider in some countries than in others (Figure I.4.10). Using PISA 2009 data, between-country differences in gender gaps in reading have been related to gender differences in attitudes, such as whether students enjoy reading, and behaviours towards reading, such as whether students read in their free time (OECD, 2015a; OECD, 2010b).



Figure I.4.10 ■ Gender differences in reading performance
Score-point difference in reading (boys minus girls)



Note: All gender differences for average students are statistically significant. Statistically significant gender differences for the lowest- and highest-achieving students are marked in a darker tone (see Annex A3).

Countries and economies are ranked in descending order of the mean score-point difference in reading performance between boys and girls.

Source: OECD, PISA 2015 Database, Tables I.4.3 and I.4.7.

StatLink <http://dx.doi.org/10.1787/888933432587>



Among the highest-performing countries and economies, some – such as Ireland, where the difference between boys and girls is only 12 points, and Japan, where it is 13 points – have gender gaps that are smaller than the OECD average, while others – such as Finland, where the gap is 47 points – have among the largest gender gaps of all participating countries. The narrowest gender gaps (less than 15 score points in favour of girls) are observed in Chile, Ireland, Japan, Lebanon and Peru. The largest gender gaps (more than a 50 score-point difference in favour of girls) are found in Albania, Georgia, Jordan, Moldova, Qatar, Trinidad and Tobago, and the United Arab Emirates.

In 49 countries and economies out of 72, the variation in performance is larger among boys than among girls; as a result, the difference between the highest-performing boys and the lowest-performing boys is significantly larger than the equivalent difference among girls. Given girls' higher performance, but less variation in scores, gender differences at the top of the performance distribution tend to be smaller than gender differences at the bottom of the distribution, among lower-achieving students (Table I.4.7). In Israel, for example, boys scoring at the 90th percentile (or close to the highest-achieving boys) perform similarly to girls scoring at the 90th percentile. But boys performing at the 10th percentile (or close to the lowest-achieving boys) score 42 points below girls performing at the 10th percentile.

In all countries except Lebanon, Malaysia and Peru, more boys than girls do not reach a baseline level of proficiency in reading (Level 2), and in a majority of countries and economies (42), more girls than boys reach the highest levels of performance (Level 5 or 6). But in Austria, Ireland, Israel, Italy, Japan, Portugal and Spain, similar shares of boys and girls are top performers in reading; together, top-performing boys and girls represent more than 5% of all students (Tables I.4.5, I.4.6a and I.4.7).

Between PISA 2009 and PISA 2015, the gender gap in reading narrowed by 12 points on average across OECD countries: boys' performance improved somewhat (by 5 points, on average), particularly among the highest-achieving boys (+9 points at the 90th percentile), while girls' performance deteriorated (by 7 points, on average), particularly among the lowest-achieving girls (-16 points at the 10th percentile). Among all PISA participants, a significant narrowing of the gender gap in reading performance was observed in 32 countries and economies, while there was no change in the gender gap in the remaining 29 countries and economies.

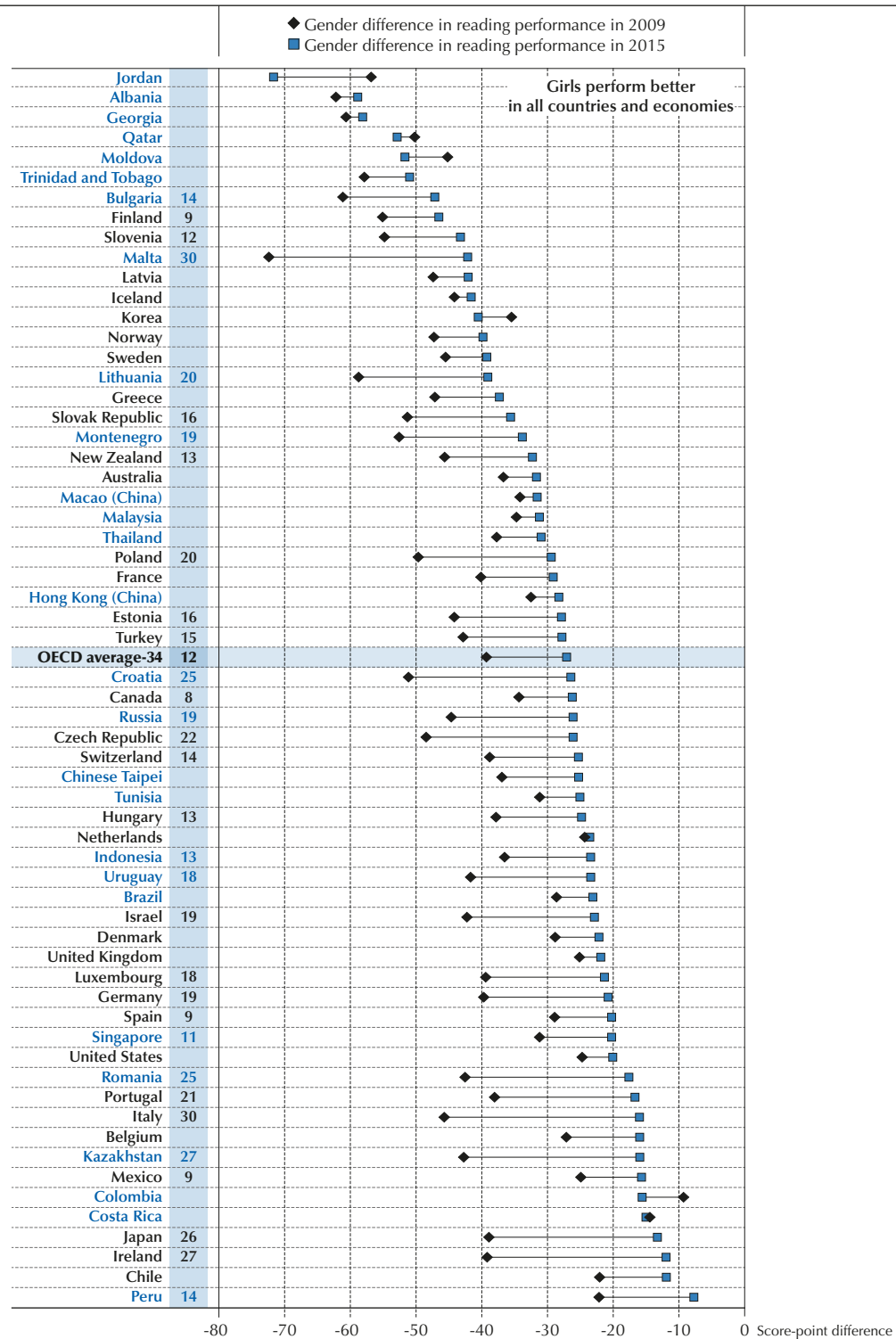
In previous PISA assessments, the gender differences in reading performance were smaller in computer-based assessments of reading (which, in 2009 and 2012, tested how well students read and navigate on line) than in paper-based assessments of reading (OECD, 2015b; OECD, 2011). Past computer-based assessments differed from paper-based assessments in at least two ways – the mode of delivery, and the content of the assessment. Both aspects could plausibly explain why gender gaps differed in the past; but each explanation has a distinct implication for gender gaps in PISA 2015, which used only questions that were originally developed for the paper-based assessments (no hypertexts were included), but delivered these questions on screen instead. If the mode of assessment makes a difference, e.g. because boys are more willing to engage with a reading test on a computer, using a keyboard or mouse, than with a reading test on paper, using a pencil or pen, gender-related differences in PISA 2015 for countries that conducted a computer-based test should be consistently smaller than gender-related differences in past PISA (paper-based) assessments of reading. If, on the other hand, the text types and questions matter more than the mode of delivery, gender-related differences in PISA 2015 should largely mirror those found in the PISA 2012 and PISA 2009 paper-based assessments of reading.⁵

Between PISA 2009 and PISA 2015, the gender gap shrank by 30 points in Malta (which delivered both PISA 2009 and PISA 2015 assessments on paper) and narrowed by between 20 and 30 points in Croatia, the Czech Republic, Ireland, Italy, Japan, Poland, Portugal and Romania (all of these countries, except Romania, delivered PISA 2015 on computer). However, in other countries that delivered the PISA 2015 test on computer – including, among OECD countries, Australia, Belgium, Chile, Denmark, France, Iceland, Korea, Latvia, the Netherlands, Norway, Sweden, the United Kingdom and the United States – the gender gap in PISA 2015 is not statistically different from the gender gap observed in PISA 2009.

In general, no clear pattern emerges when comparing gender-related performance differences in reading in PISA 2009 with differences in PISA 2015. Similar trends are found in countries that used the paper-based test as in countries that switched to the computer-based assessment: the difference between boys and girls in reading performance shrank by 10 score points, on average, in the 10 countries/economies that delivered both PISA 2009 and PISA 2015 on paper, and by 11 score points, on average, in the 53 countries/economies that changed the mode of delivery between PISA 2009 and PISA 2015 (Table I.4.8d). Moreover, the size and direction of changes in the gender gap varies across the countries that used the computer-based test. The gender gap narrowed more, on average, in the countries and economies that had the widest gaps at the beginning of the period, but the correlation between gender gaps in 2009 and subsequent changes is weak (-0.3).



Figure I.4.11 ■ **Change between 2009 and 2015 in gender differences in reading performance**
 Score-point difference in reading (boys minus girls)



Notes: All gender differences in PISA 2009 and in PISA 2015 are statistically significant (see Annex A3). Statistically significant changes between PISA 2009 and PISA 2015 are shown next to the country/economy name. Only countries and economies with available data since 2009 are shown. Costa Rica, Georgia, Malta and Moldova conducted the PISA 2009 assessment in 2010 as part of PISA 2009+. Countries and economies are ranked in ascending order of gender differences in reading performance in 2015. Source: OECD, PISA 2015 Database, Tables I.4.8a, I.4.8b and I.4.8d.

StatLink <http://dx.doi.org/10.1787/888933432594>



The direction in which the gender gap changed is often not consistent across subjects assessed, despite the fact that the mode of delivery of the PISA test changed similarly for all subjects. Specifically, the gender gap in mathematics performance remained broadly stable between PISA 2012 and PISA 2015, showing, if anything, a small reduction of boys' advantage in mathematics (see Chapter 5 and Table I.5.8e). While different modes of delivery may influence students' behaviour on the test, given the trends observed, the impact of the mode of delivery must either be of secondary importance, such that other concurrent changes in education systems explain the results, or it is specific to the country and the subject assessed.

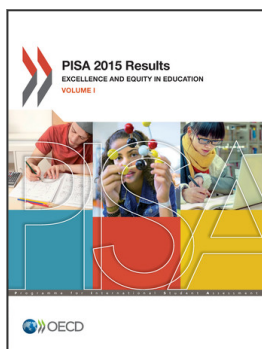
Notes

1. The results of three countries, however, are not fully comparable, because of issues with sample coverage (Argentina), school response rates (Malaysia), or construct coverage (Kazakhstan); see Annex A4. As a consequence, results for these three countries are not included in most figures.
2. This worst-case scenario allows for a computation of a robust lower bound on the median and upper percentiles.
3. Changes in design and construct coverage were particularly important in the earlier PISA assessments. The change in performance observed between PISA 2000 and later assessments may thus not always reflect genuine changes in what students know and can do, but may be the result of the different assessment design used in 2000, compared to all later assessments, and of the significantly reduced coverage of the reading domain in 2003 and 2006 (see Annex A5). The uncertainty associated with comparisons involving PISA 2000, 2003 and 2006 reading results with later results is only imperfectly captured by the linking errors. Although the regression models used in this section to measure average trends are less sensitive to measurement issues affecting one assessment only, some caution is needed when interpreting reading trends before PISA 2009.
4. Similar assumptions of below-baseline skills among the population of 15-year-olds not covered by PISA are often made in related literature (Hanushek and Woessmann, 2008; Spaul and Taylor, 2015; Taylor and Spaul, 2015).
5. In the field trial for PISA 2015, no significant difference between the gender gap in the paper-based mode and the gender gap in the computer-based mode was detected, after accounting for separate mode and gender effects by domain (see Annex A6). It is important, however, to note that the identification of gender and/or mode effects in the field trial data relied on preliminary scaling results and field trial instruments that do not reflect the main survey test.



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