



The links between the knowledge, skills and attitudes needed to thrive in an interconnected world

This chapter examines the links among the knowledge, skills and attitudes needed to thrive in an interconnected world. It explores students' performance on the cognitive global competence test and analyses how performance is related to students' demographics and their global and intercultural skills, attitudes and dispositions. The chapter also examines how certain students' outcomes are associated with system-level factors.

What the data tell us

- On the global competence cognitive test, students in Canada, Croatia, Greece, Hong Kong (China), Israel¹, Korea, Latvia, Lithuania, Scotland (United Kingdom), Singapore, the Slovak Republic, Spain and Chinese Taipei scored significantly higher than the overall average, while those in Albania, Brunei Darussalam, Chile, Colombia, Costa Rica, Indonesia, Kazakhstan, Morocco, Panama, the Philippines, Serbia and Thailand scored below the average. Students' performance in Malta and the Russian Federation was not significantly different from the average.
- The top-performing countries/economies were Canada, Hong Kong (China), Scotland (United Kingdom), Singapore and Chinese Taipei, with mean performance scores more than 50 points above the overall average.
- The range and variation of relative scores after accounting for performance in mathematics, science and reading were noticeably smaller than that of raw performance scores. Canada, Colombia, Greece, Israel, Panama, Scotland (United Kingdom), Singapore and Spain showed the highest relative performance in global competence, while Albania, Brunei Darussalam, Kazakhstan, Korea and the Russian Federation showed the lowest relative performance.
- Across all countries and economies, positive associations were observed between performance on the cognitive test and students' attitudes and dispositions, notably with students' respect for people from other cultures, attitudes towards immigrants and self-efficacy regarding global issues.

Professional success in the 21st century requires that students know about global issues and other cultures and have the ability to interact and communicate effectively with others (British Council, 2013_[1]). Such skills are important for individuals, but also for communities and societies as a whole. This chapter examines the links among the knowledge, skills and attitudes needed to thrive in an interconnected world. The chapter first explores students' performance on the cognitive test in global competence. It then investigates variations in performance related to student characteristics and the association between performance on the cognitive test and students' self-reported skills, attitudes and dispositions. The chapter also examines the relationship between various student outcomes and system-level factors, such as per capita GDP, employment and immigration.

THE PISA 2018 GLOBAL COMPETENCE COGNITIVE ASSESSMENT

As described in Chapter 1, the global competence cognitive assessment was conducted at the same time as the PISA 2018 test of reading, mathematics and science. The global competence assessment consisted of 69 test items organised in 18 units and in 4 clusters (OECD, forthcoming_[2]). As discussed earlier, the global competence framework identifies four dimensions that together form the foundation of the multidimensional construct of global competence: 1) examine issues of local, global and cultural significance; 2) understand and appreciate the perspectives and worldviews of others; 3) engage in open, appropriate and effective interactions across cultures; and 4) take action for collective well-being and sustainable development. Each of the dimensions is supported by a combination of knowledge, skills, attitudes and values. The global competence cognitive test in the 2018 main survey assessed three cognitive processes that support global competence: 1) evaluate information, formulate arguments and explain issues and situations; 2) identify and analyse multiple perspectives; and 3) evaluate actions and consequences. The cognitive process relating to the third dimension, "engage in open, appropriate and effective communication across cultures", was not assessed in the cognitive test.

The first cognitive process supporting students' capacity to examine local, global and intercultural issues was tested using 37 test items assessing cognitive sub-processes such as selecting sources, weighing sources' reliability and relevance, employing sources as a form of reasoning with evidence, and describing and explaining complex situations or problems. The second cognitive process, which supports understanding and appreciating the perspectives and worldviews of others, was assessed using 18 test items covering cognitive sub-processes such as recognising perspectives and worldviews and identifying connections. The cognitive process supporting the fourth dimension of global competence, taking action for collective well-being and sustainable development, was assessed using 14 test items covering cognitive sub-processes such as considering actions and assessing consequences and implications.

Each test unit in the assessment had a primary focus on a particular global or intercultural issue or knowledge area. Some units had a secondary focus. The framework specified four major knowledge domains that were deemed relevant to students regardless of their specific socio-cultural background. The four major knowledge domains were: culture and intercultural relations; socio-economic development and interdependence; environmental sustainability; and institutions, conflicts and human rights. The scenarios were developed to correspond to one of the four knowledge domains, with the objective of achieving the widest coverage across the test units.

Chapters 2, 3, and 5 present results on individual test items from the five released test units. This chapter analyses the scaled indices (i.e. plausible values) constructed using students' answers to all 69 test items in the cognitive test. Results of a dimensionality analysis based on the PISA 2018 pilot study suggested that the test items can be reported on one unidimensional scale. Those findings were confirmed by analyses of data from the main survey.²

It is important to note that the cognitive test only covers the cognitive aspects of global competence, which include knowledge and cognitive skills. Answers to the test items were used to create a unidimensional scale of those cognitive aspects (i.e. plausible values). However, the concept of global competence itself is multidimensional and includes cognitive aspects in addition to non-cognitive skills, attitudes and values.

PERFORMANCE IN GLOBAL COMPETENCE

This subsection focuses on students' average performance on the cognitive test before and after accounting for their proficiency in other subjects (i.e. reading, mathematics and science), variations in their performance and the proportion of students who achieved a certain level of performance.

Average level of performance in the global competence cognitive test

Of the 27 countries and economies that participated in the global competence cognitive test, only 11 were OECD countries. For this reason, all averages presented in this chapter are for all 27 participating countries and economies combined.³

Figure VI.6.1 shows the average performance on the cognitive test for each country and economy and for which pair of countries and economies the difference is not statistically significant. For each country and economy in the middle column, differences in performance with the countries/economies listed in the right column are not statistically significant. For instance, Singapore scored higher than all other 26 countries and economies, while Canada scored higher than all other countries/economies but lower than Singapore.

The countries and economies in Figure VI.6.1 are divided into three groups: those whose mean scores are statistically around the overall average (highlighted in white); those whose mean scores are above the overall average (highlighted in blue); and those whose mean scores are below the overall average (highlighted in grey). Students in Canada, Croatia, Greece, Hong Kong (China), Israel, Korea, Latvia, Lithuania, Scotland (United Kingdom), Singapore, the Slovak Republic, Spain and Chinese Taipei scored significantly higher than the overall average, while those in Albania, Brunei Darussalam, Chile, Colombia, Costa Rica, Indonesia, Kazakhstan, Morocco, Panama, the Philippines, Serbia and Thailand scored below the average. Students' performance in Malta and the Russian Federation (hereafter "Russia") was not significantly different from the average.

The top-performing countries, in descending order, were: Singapore, Canada, Hong Kong (China), Scotland (United Kingdom) and Chinese Taipei, with mean performance scores more than 50 points above the overall average (overall average score = 474 points). By contrast, the countries with the lowest mean performance (50 score points below average) were, in descending order: Thailand, Panama, Indonesia, Kazakhstan, Morocco and the Philippines.

While differences in average performance across countries and economies were large, the gap that separates the highest-performing and lowest-performing students within each country was even larger. The standard deviation summarises the variation in performance among 15-year-old students within each country/economy across the entire distribution. The average standard deviation in performance in the global competence cognitive assessment was 91 score points. Variations measured by the standard deviation in performance scores were the largest in Canada, Israel, Malta, Scotland (United Kingdom) and Singapore (exceeding 100 score points), while the smallest variations in performance were found in Albania, Indonesia, Kazakhstan, Morocco and Thailand (not exceeding 80 score points) (Table VI.B1.6.1).

Figure VI.6.2 shows a scatterplot of the mean and standard deviation of the performance scores. Canada, Scotland (United Kingdom) and Singapore stand out as three countries with the highest mean performance and greatest variations, while Indonesia, Kazakhstan, Morocco and the Philippines showed lower mean performance and the smallest variations.

Moreover, results of the decomposition of the total variance in performance between schools and within schools revealed that most variations were observed within schools. However, a relatively large proportion of the variance lies between schools. In 19 of the 27 countries and economies that participated in the global competence cognitive test, the proportion of between-school variance to total variance exceeds 30%; in Croatia, Israel, Morocco, Serbia and the Slovak Republic, it exceeds 40% (Table VI.B1.6.1). This is similar to findings from the reading test, where 29% of average variation in reading performance was observed between schools (OECD, 2019_[3]). Larger between-school dispersions could result from stratification of students between schools according to their socio-demographic characteristics or their prior academic performance.

Figure VI.6.1 Comparing countries' and economies' performance in the global competence cognitive test

Significantly above the overall average
Not Significantly different from the overall average
Significantly below the overall average

Mean score	Comparison country/economy	Countries and economies whose mean score is not statistically significantly different from the comparison country's/economy's score
576	Singapore	
554	Canada	
542	Hong Kong (China)	Scotland (United Kingdom)
534	Scotland (United Kingdom)	Chinese Taipei, Hong Kong (China)
527	Chinese Taipei	Scotland (United Kingdom)
512	Spain	Croatia, Korea
509	Korea	Croatia, Spain
506	Croatia	Korea, Spain
497	Latvia	Israel ¹
496	Israel ¹	Greece, Latvia, Lithuania
489	Lithuania	Greece, Israel, Slovak Republic
488	Greece	Israel, Lithuania, Russia, Slovak Republic
486	Slovak Republic	Greece, Lithuania, Russia
480	Russia	Greece, Malta, Slovak Republic
479	Malta	Russia
466	Chile	Serbia
463	Serbia	Chile, Colombia, Costa Rica
457	Colombia	Costa Rica, Serbia
456	Costa Rica	Colombia, Serbia
429	Brunei Darussalam	Albania, Thailand
427	Albania	Brunei Darussalam, Thailand
423	Thailand	Albania, Brunei Darussalam
413	Panama	Indonesia, Kazakhstan
408	Indonesia	Kazakhstan, Morocco, Panama
408	Kazakhstan	Indonesia, Morocco, Panama
402	Morocco	Indonesia, Kazakhstan
371	Philippines	

1. The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

Countries and economies are ranked in descending order of the mean global competence score in PISA 2018.

Source: OECD, PISA 2018 Database, Table VI.B1.6.1. and Table VI.B1.6.2.


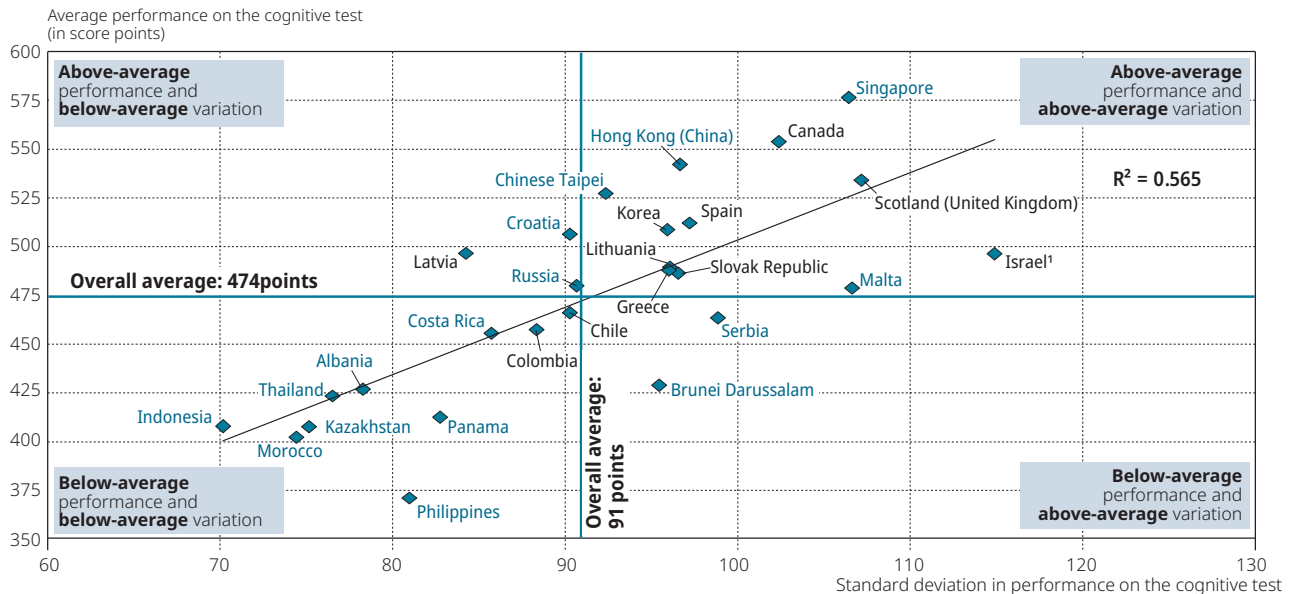

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Figure VI.6.2 Average performance on the cognitive test and variation in performance



1. The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

Source: OECD, PISA 2018 Database, Table VI.B1.6.1.

StatLink  <https://doi.org/10.1787/888934170279>

Proficiency in global competence

The previous subsection presented the average performance of students in the global competence cognitive assessment. However, average scores do not adequately describe variations in performance. This subsection examines students' performance according to PISA proficiency levels. Five proficiency levels were identified, covering the whole range of performance on the cognitive test.⁴ Proficiency scales describe not only student performance, but also the difficulty of the tasks presented to students in the assessment.

The Global Competence items were developed based on the task characteristics identified in the framework. Then, using the main survey data, those items were placed along the scale based on their statistical properties. The knowledge and cognitive skills required to successfully complete those items were reviewed and used to define performance at each level of difficulty. Four main factors that drove difficulty across the range of items were identified within this assessment of Global Competence. These four factors are described below, along with the description of proficiency at each level of performance (Figure VI.6.3). The four factors are:

Identifying and analysing perspectives

Items that require identification of only one perspective to solve the problem are the easiest among the items that require this cognitive process. The problem itself may require an explicit identification of one perspective. Other items may not require an explicit identification, but the student must be able to understand a perspective of an individual or a group of individuals to complete the problem correctly. More complex items require the ability to identify more than one perspective among several individuals or groups within a community. Furthermore, these more complex items require the student to analyse one or more perspectives in relation to the other perspectives of actors in the problem or in relation to a viewpoint or stance described in the problem. The most complex items require identifying and analysing as many as three to five perspectives.

Reasoning beyond the information given in the problem

Items vary with respect to how much the student must reason beyond the information explicitly provided in the stimulus and item. Items for which students can reason with the information provided within a problem tend to be easier. In contrast, items for which students must reason beyond the provided information tend to be harder. For example, in a problem where the actions of actors are described, it is more challenging for the student to reason about possible consequences of those actions than to evaluate the actions themselves. Similarly, it is very challenging to evaluate whether a proposed solution would have a short-term or a long-term impact. This kind of evaluation requires the student to reason even further beyond the information provided within the problem. To successfully complete these evaluations, students need to engage in critical thinking that is domain-general.

Quantity of information to evaluate

Each Global Competence item contains information such as facts about a situation described in the problem, perspectives expressed by individuals or groups in a community or actions taken by individuals. When evaluating the information within a problem, by selecting, weighing or employing sources, the quantity of information that must be evaluated varies across items. Similarly, the amount of information that must be considered to evaluate actions and consequences varies. In general, easier items typically contain less information to evaluate, while more difficult items tend to have more information to evaluate to solve the problem. A unit's scenario can make evaluating larger quantities of information more accessible to students if it provides background knowledge on the main topic of the unit or assists the student in making connections between ideas.

Describing versus explaining the situation

Several items require the student to describe or explain the situation or aspects of the situation presented in the problem. In some cases, students must select a description or explanation from a set of provided choices, and in others they must provide their own description or explanation in an open-ended, constructed-response format. Regardless of the item's response format, the item is easier when the scope of the item is more focused on a description of the situation or aspects of the situation than when it is focused on an explanation. Items that require the student to identify or create an explanation for a situation often draw upon causal reasoning and a deeper connection between sources of information in the problem.

Even though a student's performance at any moment in time can be located on the performance and proficiency scales, one should keep in mind that developing global competence is a lifelong learning process. Students who start at a lower proficiency level could develop their knowledge, skills and attitudes through exposure to the right learning opportunities. Moreover, unlike mathematics and science, which require a certain level of specialisation in adult life if students choose a particular career orientation, global competence constitutes a general set of knowledge, skills and attitudes that all people, young and old, need at all stages of life, regardless of their professional choices. Indeed, students may lose their proficiency in mathematics in adult life if they specialise in a field that does not require extensive use of their mathematical skills. However, knowledge, skills and attitudes related to global and intercultural understanding are less likely to erode with time, as they are relevant in nearly all social contexts.

Figure VI.6.3^[1/2] Summary description of the six levels of proficiency in global competence in PISA 2018

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (Overall average)	Characteristics of tasks
5	661 or higher	4.3	At Level 5, students can identify and analyse multiple perspectives. These students can reason about ideas and make predictions well beyond the information given in the problem while also effectively evaluating very large amounts of information. Students at this level can reason with this large amount of information without additional support provided in the unit's scenario, meaning they can make connections across elements of the problem on their own. Students can effectively explain situations and aspects of situations that require complex types of thinking such as recognizing unintended consequences, evaluating information to differentiate between biased and unbiased sources and identifying short- and long-term consequences of actions. Students at Level 5 are capable of building complex models of the situation described in the stimulus and item in order to solve the problem. They demonstrate consistency in their ability to explain situations across multiple activities within a problem.
4	596	13.6	At Level 4, students can identify and analyse as many as five different perspectives within a problem. Students at this level demonstrate the ability to reason further beyond the explicit information provided in the text while evaluating a large amount of information. However, this evaluation is supported by information such as background knowledge that is provided in the scenario of the unit, which may facilitate connections between pieces of information in the problem. Students can provide descriptions of situations that are less familiar or require deeper reasoning such as ones that require causal reasoning. Students can also provide explanations of situations and aspects of situations. They demonstrate consistency in their ability to assess, describe and/or explain situations across multiple activities within a problem.
3	531	29.8	At Level 3, students can identify and analyse two to three different perspectives within a situation. At this level, a trade-off is observed between students' ability to reason beyond the explicit information provided in the problem and the amount of information that must be evaluated. Students can reason further beyond the information provided in the problem as long as the amount of information that must be evaluated is more minimal. Conversely, students demonstrate the ability to evaluate greater amounts of information as long as the item does not require reasoning that extends too much beyond the information provided in the problem. Under these conditions, students can evaluate a medium to high amount of information within the stimulus and item. Students at Level 3 can explain the situation or aspects of the situation. They demonstrate consistency in being able to assess, describe and/or explain situations across multiple activities within a given problem.

Source: OECD, PISA 2018 Database, Table VI.B1.6.1.



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Figure VI.6.3^[2/2] Summary description of the six levels of proficiency in global competence in PISA 2018

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (Overall average)	Characteristics of tasks
2	466	51	At Level 2, students can correctly identify two different perspectives within a situation. Students can reason beyond the described situation when the quantity of information remains minimal. When students are asked to reason about information provided in the problem, students at this level can evaluate minimal to medium amounts of information. Students can describe the situation or aspects of the situation as well as identify a correct explanation of a situation. When there is a minimal amount of information to evaluate, they can explain the situation or aspects of the situation.
1	401	73.5	At Level 1, students can identify one perspective correctly and use information from that perspective to complete the item. Students can reason beyond the explicit information provided in the stimulus or item to understand a novel situation when the context is very familiar such as having to relocate. The cause of the move can be novel (i.e. climate change), but the hardships that come from relocating are familiar and the student can easily “put themselves in someone else’s shoes” by thinking about what it was like or would be like to move. At this level, students are able to evaluate a minimal amount of information while completing the item. Students can describe the situation or aspects of the situation.

Source: OECD, PISA 2018 Database, Table VI.B1.6.1.

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Proficiency at Level 5

At the highest level of proficiency in global competence, students are able to analyse and understand multiple perspectives. They are able to examine and evaluate large amounts of information without much support provided in the unit’s scenario. Students can effectively explain situations that require complex thinking and extrapolation and can build models of the situation described in the stimulus. On average across all countries, 4% of students attained the highest level of proficiency (Level 5) in global competence (Figure VI.6.4). The largest proportions of students who scored at this level were found in Singapore (22%), Canada (15%) and Scotland (United Kingdom) (12%). Less than 2% of students in Albania, Brunei Darussalam, Chile, Colombia, Costa Rica, Indonesia, Kazakhstan, Morocco, Panama, the Philippines and Thailand attained this level of proficiency. In general, countries and economies with high average performance on the cognitive test tended to have more students performing at the highest proficiency levels.

Proficiency at Level 4

At Level 4, students could analyse as many as five different perspectives while demonstrating the ability to reason further beyond the information that is provided in the scenario. Students can provide explanations of unfamiliar situations that require deeper reasoning, such as causal inference. However, at this level, explanations provided by the students are facilitated by the information provided in the test unit’s summary. On average across all countries, 9% of students attained proficiency Level 4 in global competence. The proportions of students who scored at this level were the largest in the top-performing countries. The largest proportions, ranging between 20% and 24% of students, were observed in Canada, Hong Kong (China) and Singapore, while the smallest proportions (ranging between 0.6% and 1.7% of students) were observed in Albania, Indonesia, Kazakhstan, Morocco, Panama, the Philippines and Thailand.

Proficiency at Level 3

Students at Level 3 of proficiency in global competence are able to analyse two to three perspectives. They are able to reason with the information provided in the scenario of the test unit as long as the amount of information that must be evaluated is manageable. Students also demonstrate an ability to evaluate greater amounts of information as long as they do not have to extrapolate too much beyond the information provided to them. On average across all countries, 16% of students attained proficiency Level 3 in global competence. Between 20% and 27% of students in Canada, Croatia, Greece, Hong Kong (China), Korea, Latvia, Lithuania, Scotland (United Kingdom), Singapore, Spain and Chinese Taipei scored at this level, while no more than 8% attained Level 3 in Albania, Indonesia, Kazakhstan, Morocco, Panama, the Philippines and Thailand.

Proficiency at Level 2

At this level of proficiency, students can identify two perspectives and can evaluate minimal to medium amounts of information. They can reason beyond the described situation when the amount of information provided to them remains minimal. On average across all countries, 21% of students attained Level 2 proficiency in global competence. Between 26% and 29% of students in Croatia, Latvia and Russia performed at this level, while between 9% and 15% of students in Indonesia, Kazakhstan and the Philippines did so.

Proficiency at Level 1

At Level 1, students can identify one perspective correctly and use information from the summary of a scenario to complete the corresponding question. They can reason beyond the explicit information provided in the stimulus to understand a novel situation when the context is very familiar. At this level, students are able to evaluate a minimal amount of information and to describe a situation or aspects of a situation. On average across all countries, 23% of students performed at proficiency Level 1 in global competence. Around 30% of students in Albania, Indonesia, Kazakhstan and Thailand performed at this level, while less than 15% of students in Canada, Hong Kong (China) and Singapore did so.

Proficiency below Level 1

While none of the items in the Global Competence item pool fell within a “below Level 1” category, it is nevertheless useful to consider the characteristics of tasks that could be developed to assess skills at that level. Future assessments could focus on developing items that assess the precursor skills that support a student’s ability to engage in more in-depth problems within this innovative domain. Items built to assess skills below Level 1 should be more explicit in nature, drawing heavily on the information provided within the stimulus and item itself. These items should not require the student to reason beyond the information provided in the text. Students could engage in problems where the primary task is an explicit identification of a perspective. For example, students could be asked to select the correct perspective of an actor in the problem from a set of choices. This would be a precursor to Level 1 because, at Level 1, students must already use information derived from identifying a perspective to complete the problem, not simply identify the perspective. The amount of information the student must evaluate should be kept to a minimum by limiting the number of perspectives to only one and/or limiting the number of sources of information. For items below Level 1, the unit’s scenario can also be used to provide additional support through background knowledge or by making connections between perspectives or pieces of information explicit to the student. On average across all countries, 26% of students did not attain Level 1 proficiency in global competence. More than 40% of students in Brunei Darussalam, Indonesia, Kazakhstan, Morocco, Panama, the Philippines and Thailand performed below Level 1. By contrast, less than 10% of students in Canada, Hong Kong (China), Singapore and Chinese Taipei performed at this level.

How performance on the global competence test is related to performance in reading, mathematics and science

A comparison of country/economy performance in reading, mathematics, science and global competence reveals that students in Canada, Hong Kong (China), Scotland (United Kingdom), Singapore and Chinese Taipei tended to perform well in all four subjects. Thus, one may wonder about the extent to which performance on the global competence test may be correlated with performance in the other subjects.

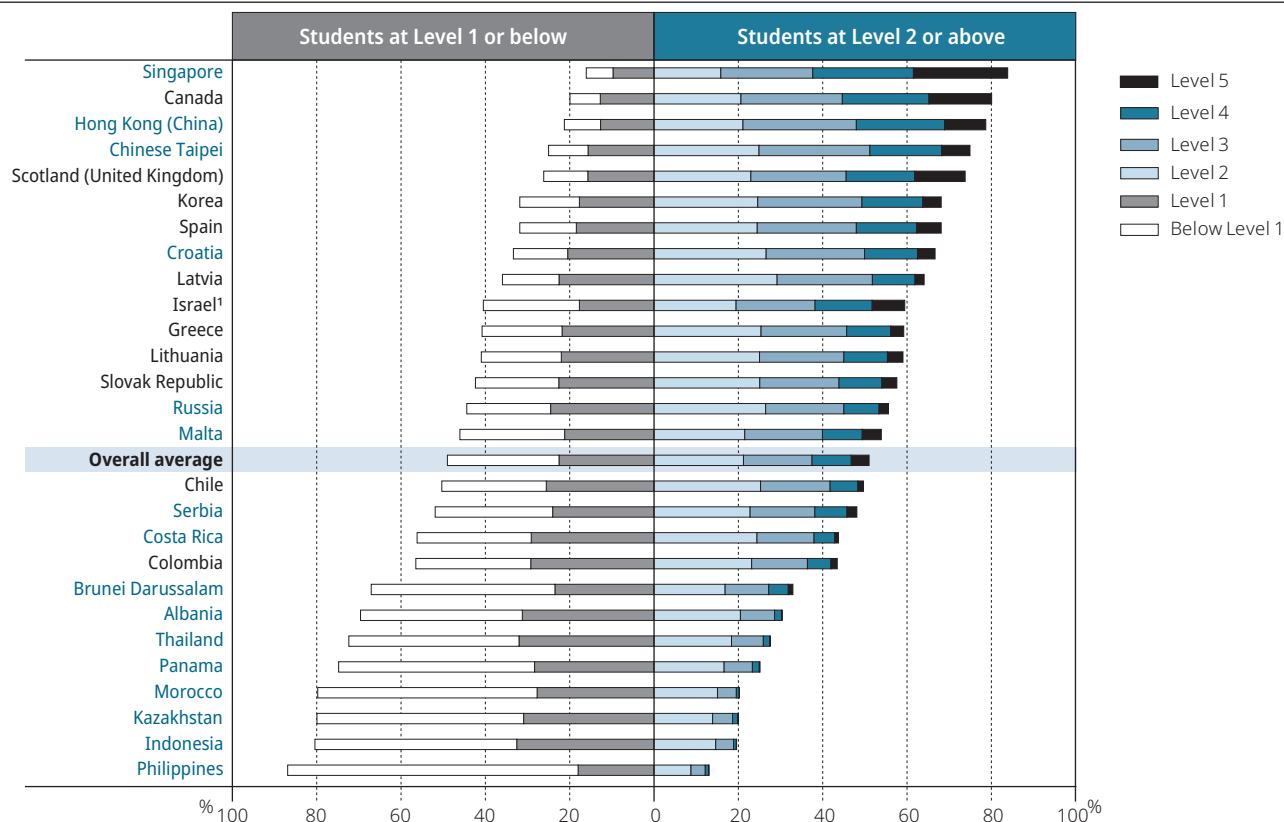
Scores in the four subjects were indeed highly correlated, as Figure VI.6.5 shows. On average across the 27 countries and economies that conducted the global competence assessment, performance on this test was correlated at 0.84 with performance in reading, at 0.79 with performance in science and at 0.73 with performance in mathematics. The correlation between performance on the global competence test and performance in reading was the same as that between performance in reading and in science. The strongest correlations between performance on the global competence and reading tests were found in Brunei Darussalam, Israel, Lithuania, Malta and Chinese Taipei, while the weakest were observed in Costa Rica, Indonesia, Kazakhstan, Scotland (United Kingdom) and Thailand (Table VI.B1.6.3).

The strong correlations could indicate that high performance on cognitive tests, regardless of the subject, could be underpinned by general cognitive skills. For instance, high performance in global competence and science would require students to be able to read and understand the scenarios provided in the test units and the questions they need to answer. As such, an adequate level of proficiency in reading is a prerequisite for sitting written tests in other subjects. Moreover, both reading and global competence require certain skills, such as weighing sources’ reliability and relevance, reasoning with evidence, and describing and explaining complex situations and problems.

However, reading proficiency does not necessarily account for all variations in performance on the global competence cognitive test. This indicates that specific cognitive skills in global competence may be needed to perform well on the test. Those skills go beyond general reading skills.

Given that performance in global competence is closely linked to performance in the three core PISA domains of reading, mathematics and science, it is possible to isolate the distinctive aspects of global competence by regressing scores in global competence over scores in the three core domains. Each student’s relative performance – his or her performance in global competence after accounting for proficiency in reading, mathematics and science – was calculated. This calculation pooled data from all countries and economies that participated in PISA and thus allowed for the ranking of countries and economies by their average relative performance.⁵

Figure VI.6.4 Students' proficiency in global competence



1. The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

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

Source: OECD, PISA 2018 Database, Table VI.B1.6.1.

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Figure VI.6.5 Performance in global competence and in other PISA subjects

Correlation between performance in ...			
Mathematics	Reading	Science	... and performance in ...
0.73	0.84	0.79	Global competence
	0.79	0.78	Mathematics
		0.85	Reading

Source: OECD, PISA 2018 Database, Table VI.B1.6.3.

StatLink <https://doi.org/10.1787/888934170336>

Figure VI.6.6 shows the relative performance in global competence of each participating country and economy. The values range from a high of 20 points for Colombia to a low of -25 points for Korea. Countries and economies are also divided into three broad groups: 1) those whose mean relative scores are statistically around the overall mean (pale blue bars); 2) those whose mean relative scores are above the overall mean (dark blue bars); and 3) those whose mean relative scores are below the overall mean (black bars).

The range and variation of relative scores are noticeably smaller than that of raw performance scores. One way to interpret such scores is to say that, on average, students in Colombia scored 20 points higher than expected, given their scores in reading, mathematics and science. Relative performance was significantly higher than the overall average in 11 countries and economies, while it was not statistically different from the average in 6 countries/economies and was below the average in 10 others. Canada, Colombia, Greece, Israel, Panama, Scotland (United Kingdom), Singapore and Spain showed the highest relative performance in global competence, while Albania, Brunei Darussalam, Kazakhstan, Korea and Russia showed the lowest relative performance.

There are notable differences between country comparisons of raw and relative scores in global competence. For instance, while Indonesia was significantly below the overall average raw performance, it was not significantly different from the relative average performance. Moreover, Malta's and Russia's raw performance was not significantly different from the overall average, while Malta's relative performance was three score points above the relative performance average, and Russia's relative performance was 20 score points below the mean. These differences may be explained by students in these countries being stronger/weaker in the unique aspects of global competence, after accounting for their performance in reading, mathematics and science.

HOW DOES PERFORMANCE ON THE COGNITIVE TEST VARY ACCORDING TO STUDENTS' CHARACTERISTICS?

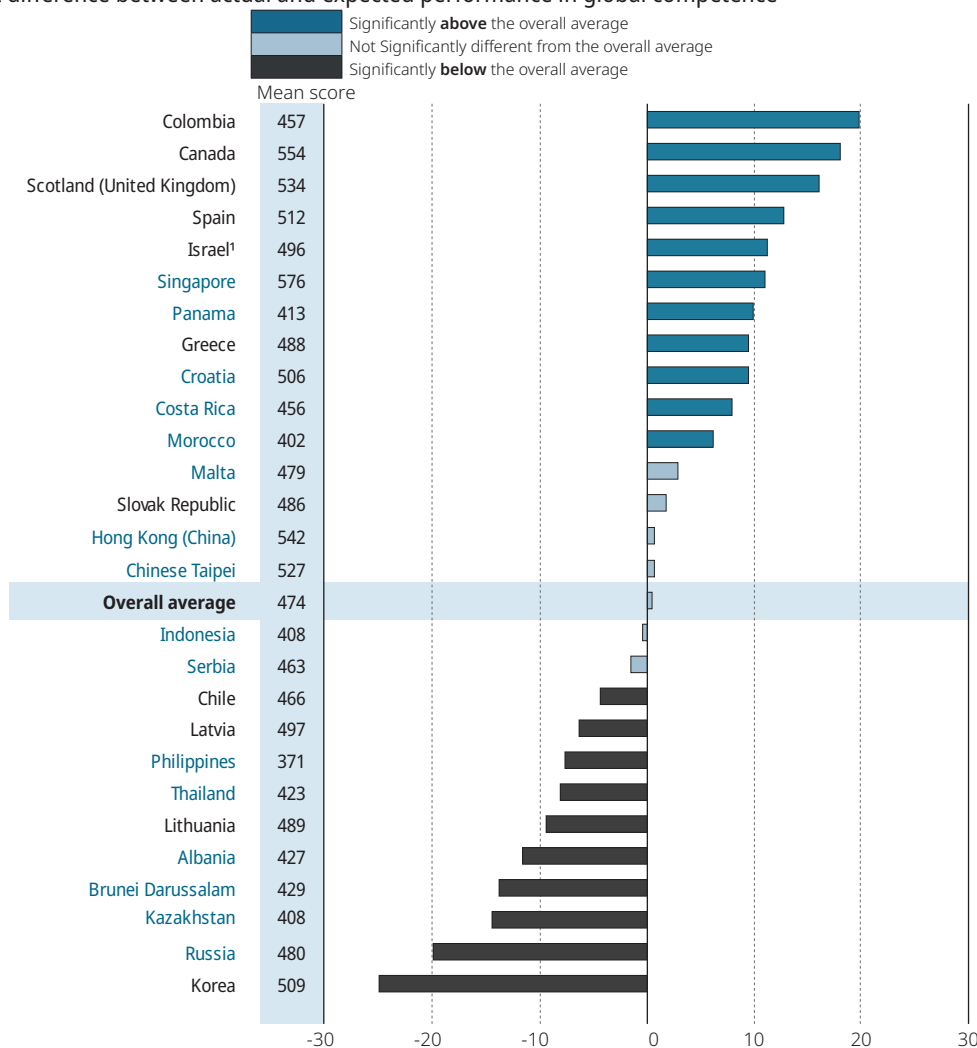
How is performance in global competence related to gender, socio-economic status and immigrant background? This subsection examines students' performance on the global competence test considering students' socio-demographic characteristics.

Students' economic, social and cultural status

In line with differences in performance in reading, mathematics and science related to socio-economic status, students from advantaged backgrounds (those in the top quarter of the PISA index of economic, social and cultural status) tended to outperform their disadvantaged peers (those in the bottom quarter of the PISA index of economic, social and cultural status) in the cognitive global competence test. Differences were positive and statistically significant in all countries and economies (Table VI.B1.6.4).

Figure VI.6.6 Countries' and economies' relative performance in global competence

Score-point difference between actual and expected performance in global competence



1. The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details

Countries and economies are ranked in descending order of the relative performance in global competence.

Source: OECD, PISA 2018 Database, Table VI.B1.6.1.

StatLink <https://doi.org/10.1787/888934170355>

On average across the 27 participating countries and economies, advantaged students outperformed their disadvantaged peers by 75 score points. The largest differences in favour of advantaged students (more than 80 score points) were observed in Brunei Darussalam, Chile, Costa Rica, Israel, Lithuania, Malta, the Philippines, Scotland (United Kingdom), Singapore, the Slovak Republic and Chinese Taipei. The smallest differences (less than 60 score points) were observed in Albania, Hong Kong (China), Indonesia, Kazakhstan, Morocco and Thailand.

The differences between advantaged and disadvantaged students were largely attenuated when relative performance (after netting out performance in reading, mathematics and science) on the cognitive test was considered. Differences became statically non-significant in 17 countries and economies, but remained significant and positive in 10: Brunei Darussalam, Canada, Chile, Costa Rica, Croatia, Latvia, Lithuania, Russia, Singapore and Spain. On average across all countries and economies, advantaged students outperformed disadvantaged students by six score points in terms of relative performance (Figure VI.6.7).

Students' gender

Differences related to gender were also observed in performance on the global competence test. Girls outperformed boys in all countries and economies except Scotland (United Kingdom), where the difference was not statistically significant (Figure VI.6.8). On average across all countries and economies, girls outperformed boys by 26 score points. The largest gender differences in favour of girls were observed in Greece, Lithuania, Malta, Serbia and Thailand, while the smallest were observed in Chile, Colombia, Costa Rica, Panama and Russia. Differences between girls and boys in relative performance on the cognitive test were non-significant in 7 countries and economies, while girls outperformed boys in the other 20.

Students' immigrant background

Of the 15 countries and economies where at least 5% of students have an immigrant background, differences in performance in global competence between immigrant and native-born students were statically non-significant in 7 (Table VI.B1.6.4). Immigrant students outperformed their native-born peers in Brunei Darussalam, Panama and Singapore, while the reverse was observed in Costa Rica, Croatia, Greece, Israel and Spain.

Differences in relative performance between immigrant and native-born students were mostly non-significant, with few exceptions (Figure VI.6.9). Immigrant students outperformed their native-born peers in Brunei Darussalam, Hong Kong (China) and Singapore, while the reverse was observed in Croatia and Israel. Thus, there is no clear pattern regarding the performance of immigrant and native-born students when it comes to relative performance on the global competence test.

Comparisons between differences in raw and relative performance on the cognitive test reveal that there were fewer differences between socio-economically advantaged and disadvantaged students, between girls and boys, and between immigrant and native-born students in the cognitive skills that are specific to global competence. In other words, a large proportion of demographic differences in raw performance can be attributed to differentials in performance in reading, mathematics and science and less so to performance in global competence.

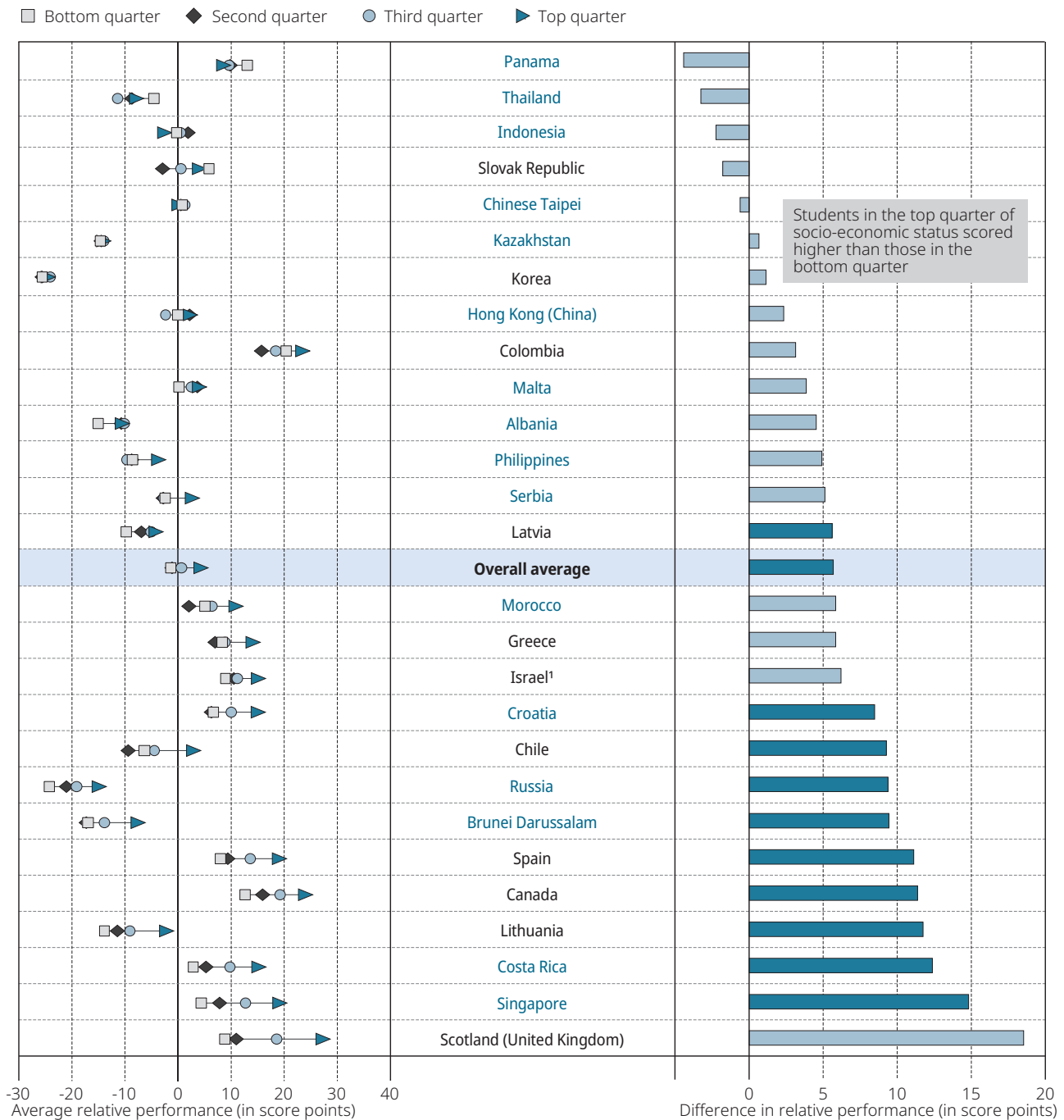
ASSOCIATIONS BETWEEN PERFORMANCE ON THE COGNITIVE TEST AND STUDENTS' ATTITUDES AND DISPOSITIONS

Positive intercultural attitudes and dispositions combined with knowledge of global issues are likely to translate into greater cognitive skills and a heightened capacity to take action for collective well-being and sustainable development. Students' attitudes towards a given task will influence their performance on that task, the effort they put into learning and the level of motivation they have for developing a particular skill. The reverse is also true, as highly developed global and intercultural understanding could translate into more positive attitudes and dispositions. This subsection examines the association between students' self-reported knowledge, attitudes, skills and dispositions and their performance on the cognitive test.

In general, the findings show positive associations between students' attitudes and dispositions and their performance on the cognitive test (Table VI.B1.6.5). This association is attenuated after accounting for students' and schools' socio-economic profile, but it remains positive and significant in almost all countries and economies.

Figure VI.6.10 shows the average change in performance on the cognitive test associated with an increase of one unit in the nine indices of students' attitudes and dispositions. Across all countries and economies with valid data, a rise of one unit in the index of respect for people from other cultures was associated with an improvement of 19 score points on the cognitive test, after accounting for students' and schools' socio-economic profile. A one-unit increase in the index of students' attitudes towards immigrants was associated with an improvement of 17 score points, as was a one-unit rise in the index of cognitive adaptability. An increase of one unit in the index of self-efficacy regarding global issues was associated with an improvement of 16 score points on the cognitive test; and a one-unit increase in the index of awareness of global issues was associated with an improvement of 12 score points on the test.

Figure VI.6.7 Differences in relative performance in global competence, by socio-economic status



1. The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

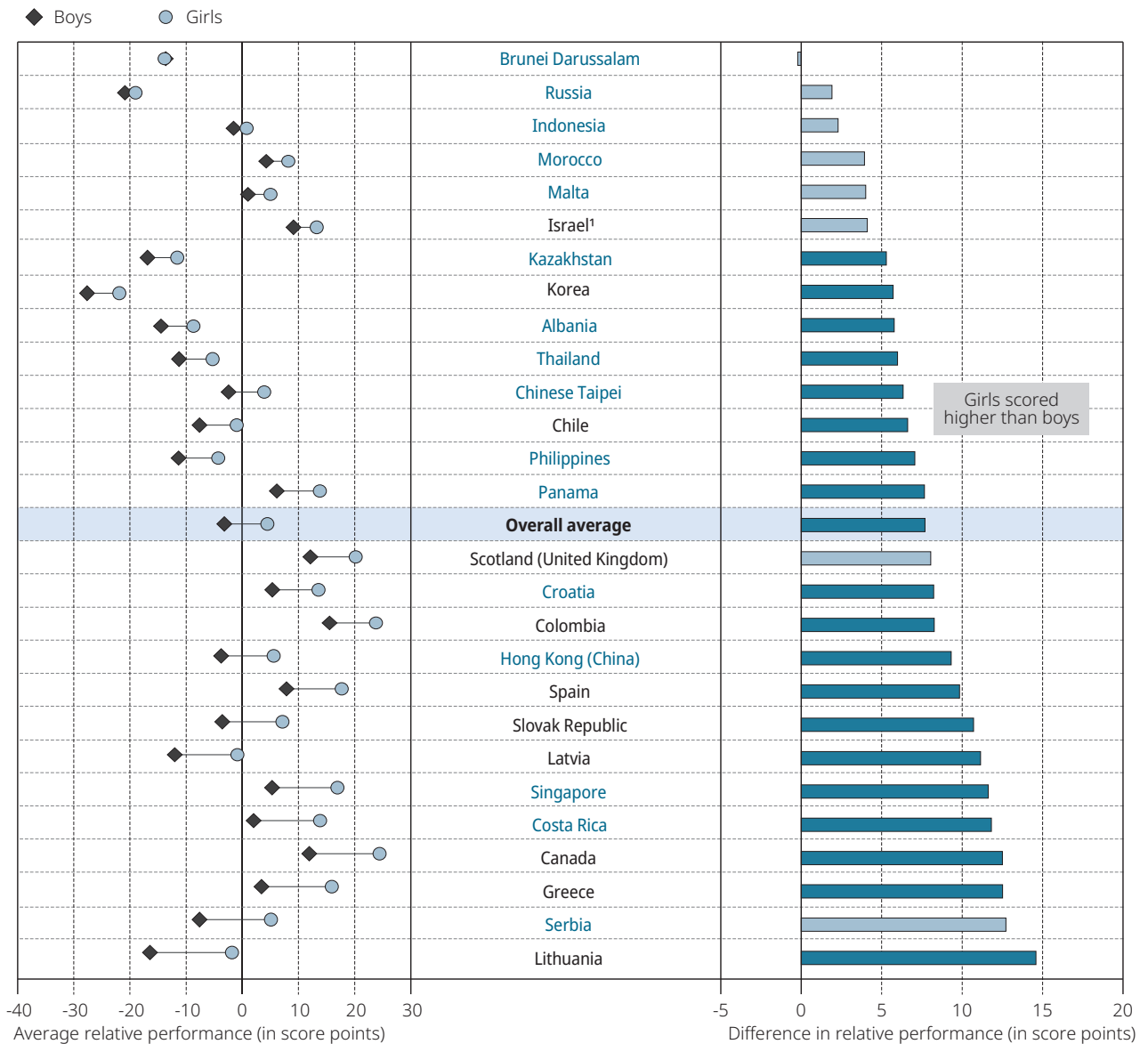
Note: Statistically significant values are shown in darker tones in the figure on the right.

Countries and economies are ranked in descending order of the score-point difference in global competence performance between top and bottom quarters on the index of students' socio-economic status.

Source: OECD, PISA 2018 Database, Table VI.B1.6.4.

StatLink <https://doi.org/10.1787/888934170374>

Figure VI.6.8 Differences in relative performance in global competence, by gender



1. The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

Note: Statistically significant values are shown in darker tones in the figure on the right

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

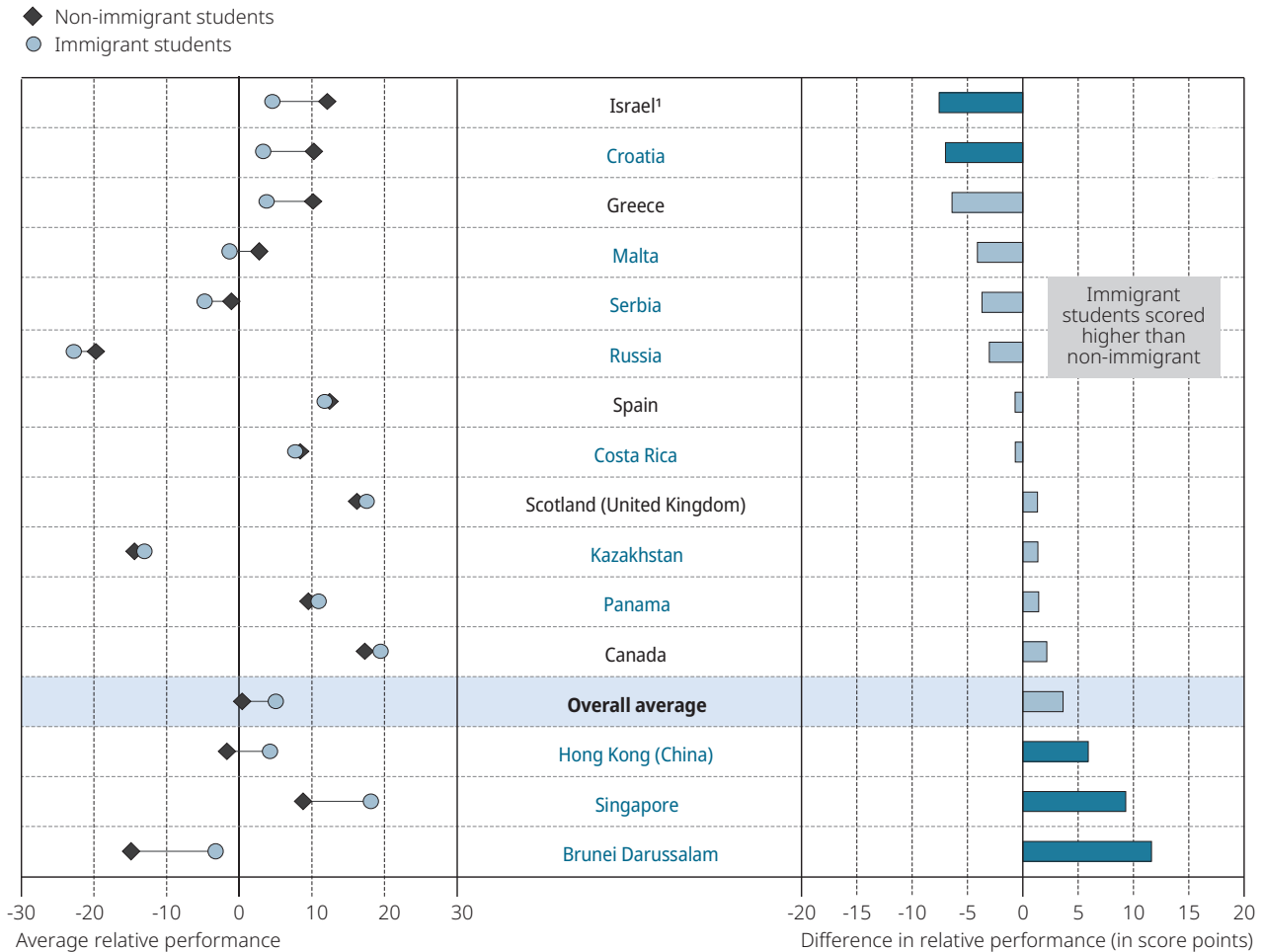
Source: OECD, PISA 2018 Database, Table VI.B1.6.4.

StatLink <https://doi.org/10.1787/888934170393>

Weaker associations were observed for the remaining indices (perspective taking, interest in learning about other cultures, awareness of intercultural communication, and agency regarding global issues). On average across the 27 countries and economies that participated in the global competence test, an increase of one unit in those indices was associated with an improvement of between 6 and 11 score points on the cognitive test. The positive associations between self-reported knowledge, skills and attitudes and performance on the cognitive test were also matched by large differences in performance between the top and bottom quarters on the indices measuring students' self-reported knowledge, skills, attitudes and dispositions.

The strongest associations were observed between the index of respect for people from other cultures and students' performance on the cognitive test. In Canada, Korea, Latvia, Malta, Scotland (United Kingdom) and Spain, a rise of one unit in the index of respect for people from other cultures was associated with an improvement of 23 to 27 score points on the assessment. The weakest associations, with performance improvements (ranging between 10 and 15 score points) were observed in Costa Rica, Indonesia and Kazakhstan (Figure VI.6.11).

Figure VI.6.9 Differences in relative performance in global competence, by immigrant background



¹ The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

Note: Statistically significant values are shown in darker tones in the figure on the right.

Differences between immigrant and non-immigrant students are presented only for countries/economies where more than 5% of students have an immigrant background.

Countries and economies are ranked in descending order of the score-point difference in global competence performance between immigrant and non-immigrant students.

Source: OECD, PISA 2018 Database, Table VI.B1.6.4.

StatLink <https://doi.org/10.1787/888934170412>

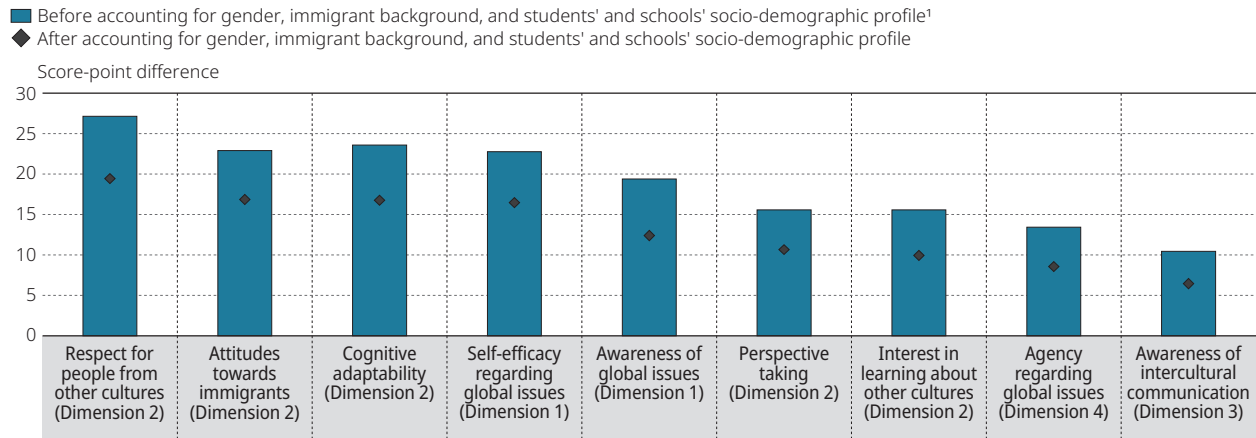
These findings confirm the expectation that students who express respect towards people from different backgrounds and who are aware of and feel confident when confronting intercultural and global issues tend to perform better on the global competence cognitive test. This indicates that positive attitudes, in general, could translate into stronger cognitive abilities.

ATTITUDES, DISPOSITIONS AND SKILLS, AND STUDENTS' SURROUNDING CIRCUMSTANCES

Most social theories addressing the question of social change foresee the fragmentation of societies where traditional institutions play a small role in holding society together (Green and Janmaat, 2011_[4]). Multiple explanations have been advanced about the erosion of social bonds. One theory focuses on the decline of national identities due to social and cultural diversification associated with migration and a globalised economy. Those phenomena gave a greater voice to the individual, removed barriers to global interactions and changed our perception of place (Touraine, 2000_[5]; Castells, 2009_[6]). As a result, new complex identities emerged as individuals ceased to identify with the national collective and embraced supra-national identities or more localised ones based on ethnicity, region, religion and lifestyle. This phenomenon is compounded by the rise of structural inequalities in most developed countries. Those inequalities were linked to a multitude of social problems, including higher crime, lower public health, lower levels of well-being and declining social cohesion (Wilkinson and Pickett, 2009_[7]).

Figure VI.6.10 **Students' attitudes and dispositions, and performance in global competence**

Score-point difference associated with a one-unit increase in the indices of students' attitudes and dispositions, Overall average



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

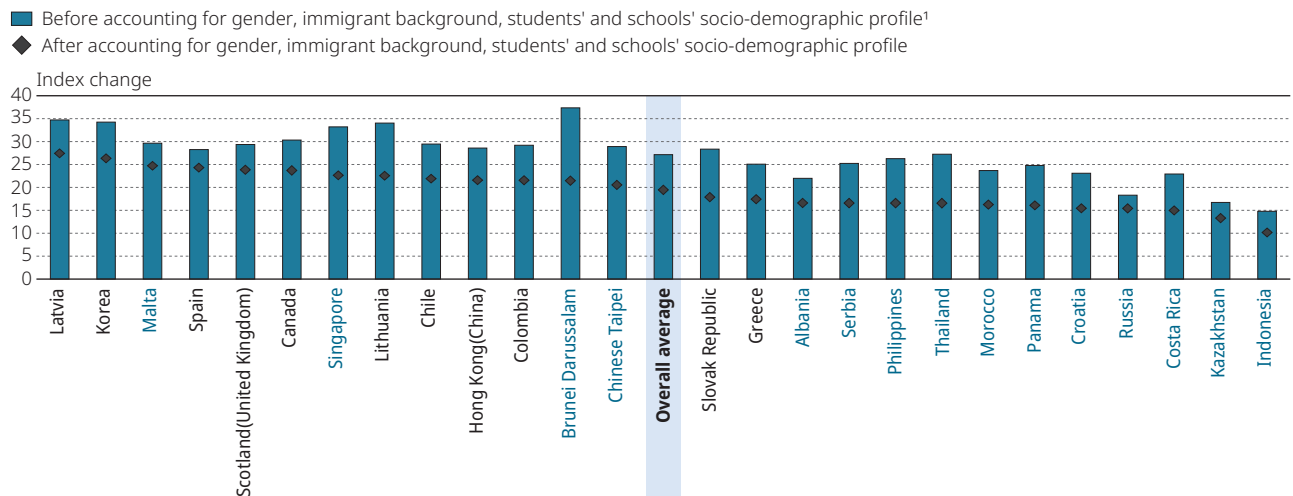
Note: All associations are statistically significant.

Source: OECD, PISA 2018 Database, Table VI.B1.6.5.

StatLink <https://doi.org/10.1787/888934170431>

Figure VI.6.11 **Students' respect for people from other cultures and performance in global competence**

Score-point difference in performance on the global competence test associated with a one-unit increase in the index of students' respect for people from other cultures



1. The socio-economic profile is measured by the PISA index of economic, social and cultural status (ESCS).

Note: All associations are statistically significant.

Countries and economies are ranked in descending order of regression coefficient, after accounting for gender, immigrant background, and students' and schools' socio-economic profile.

Source: OECD, PISA 2018 Database, Table VI.B1.6.5.

StatLink <https://doi.org/10.1787/888934170450>

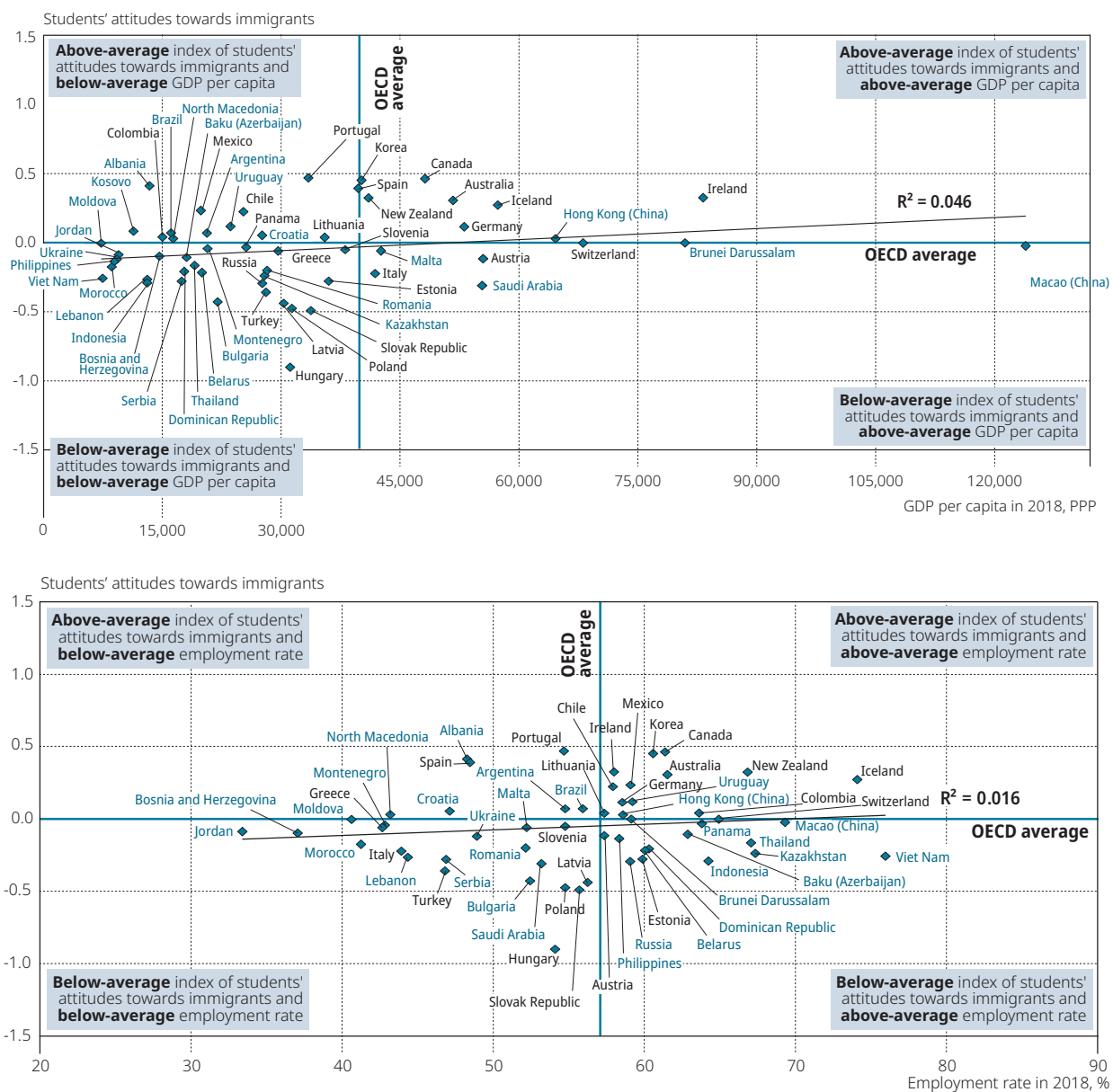
In this subsection, students' attitudes and performance on the cognitive test are explored in the light of key system-level characteristics (Table VI.B1.6.6). Those characteristics include per capita GDP, employment rate, immigrant stock in 2015 (the proportion of immigrants in a country/economy), and average income Gini coefficient over the period of 2010 to 2018.⁶ The working assumption is that students living in countries enjoying greater economic prosperity and lower inequalities and where jobs are abundant are more likely to exhibit positive attitudes and dispositions.

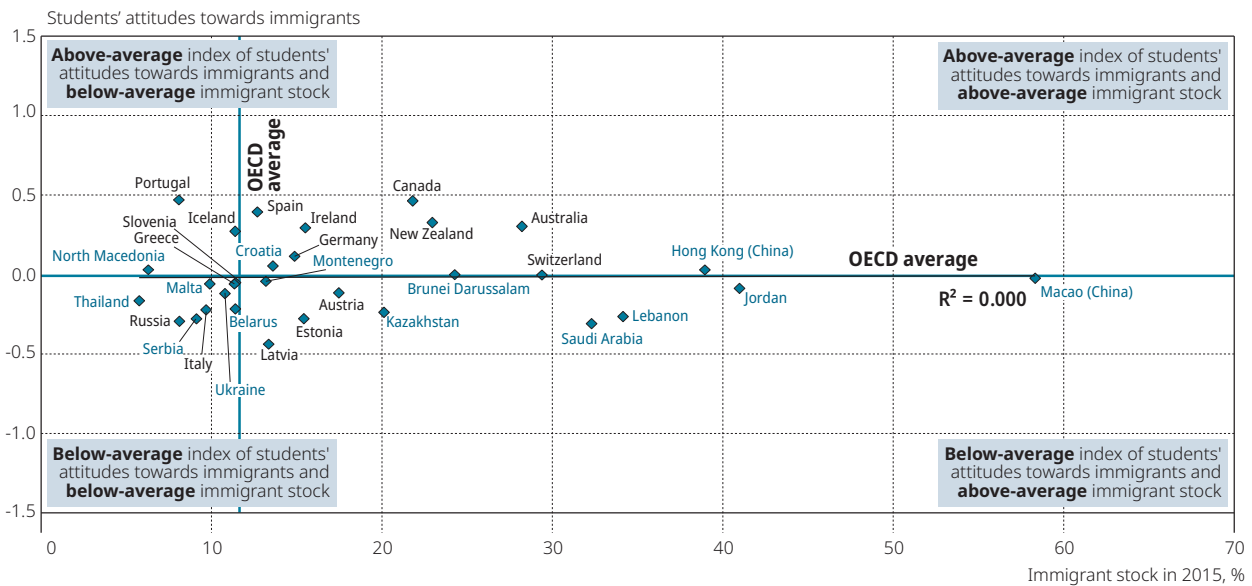
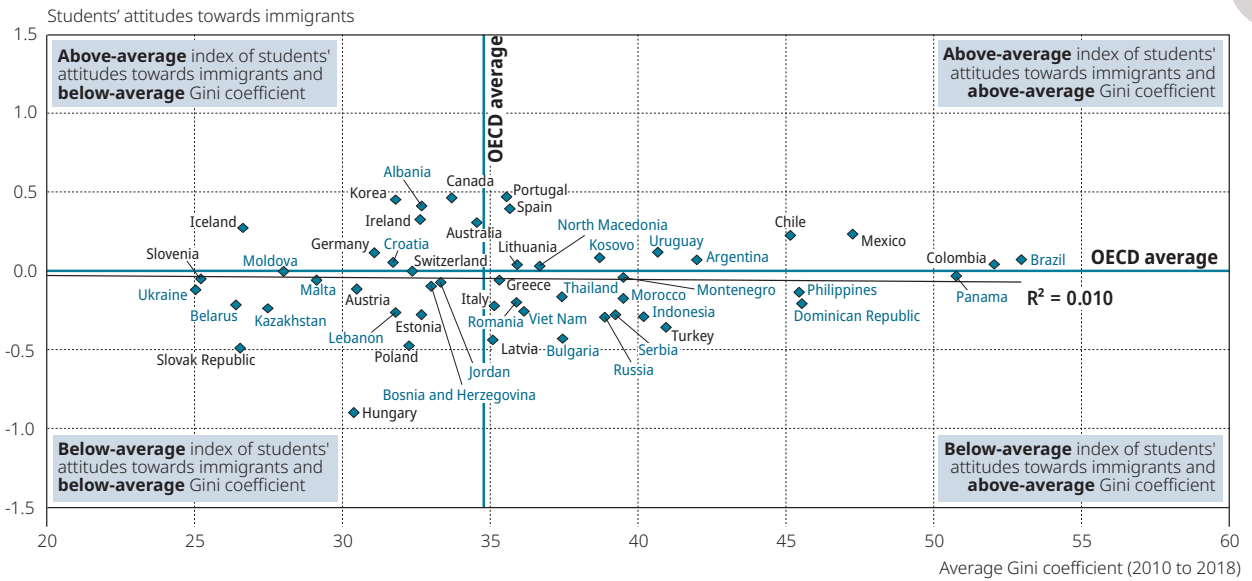
The links between the knowledge, skills and attitudes needed to thrive in an interconnected world

Findings show a positive albeit weak association between students' average attitudes towards immigrants at the country or economy level and a country/economy's per capita GDP and employment rate (Figure VI.6.12). In other words, students living in prosperous countries tended to exhibit more positive attitudes towards immigrants. This is not surprising since, in this context, immigrants are less likely to be seen as competitors for scarce jobs and opportunities, but rather as valuable assets to the economy. Countries/economies with high per capita GDP where students reported more positive attitudes towards immigrants include Australia, Iceland and Ireland. Countries/economies with high employment rates and more positive attitudes towards immigrants include Australia, Iceland and New Zealand.

No associations were observed between attitudes towards immigrants and the proportion of immigrants in a country or the income Gini coefficient. Countries/economies with a large proportion of immigrants and more positive attitudes towards immigrants include Australia, Canada and New Zealand. Countries/economies with less income inequality (i.e. lower Gini coefficient) and more positive attitudes towards immigrants include Albania, Ireland and Korea. By contrast, countries/economies with higher income inequality and less positive attitudes towards immigrants include Bulgaria, Indonesia and Turkey.


Figure VI.6.12 **Students' attitudes towards immigrants and their surrounding circumstances**





Note: The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

Source: OECD, PISA 2018 Database, Table VI.B1.6.6.

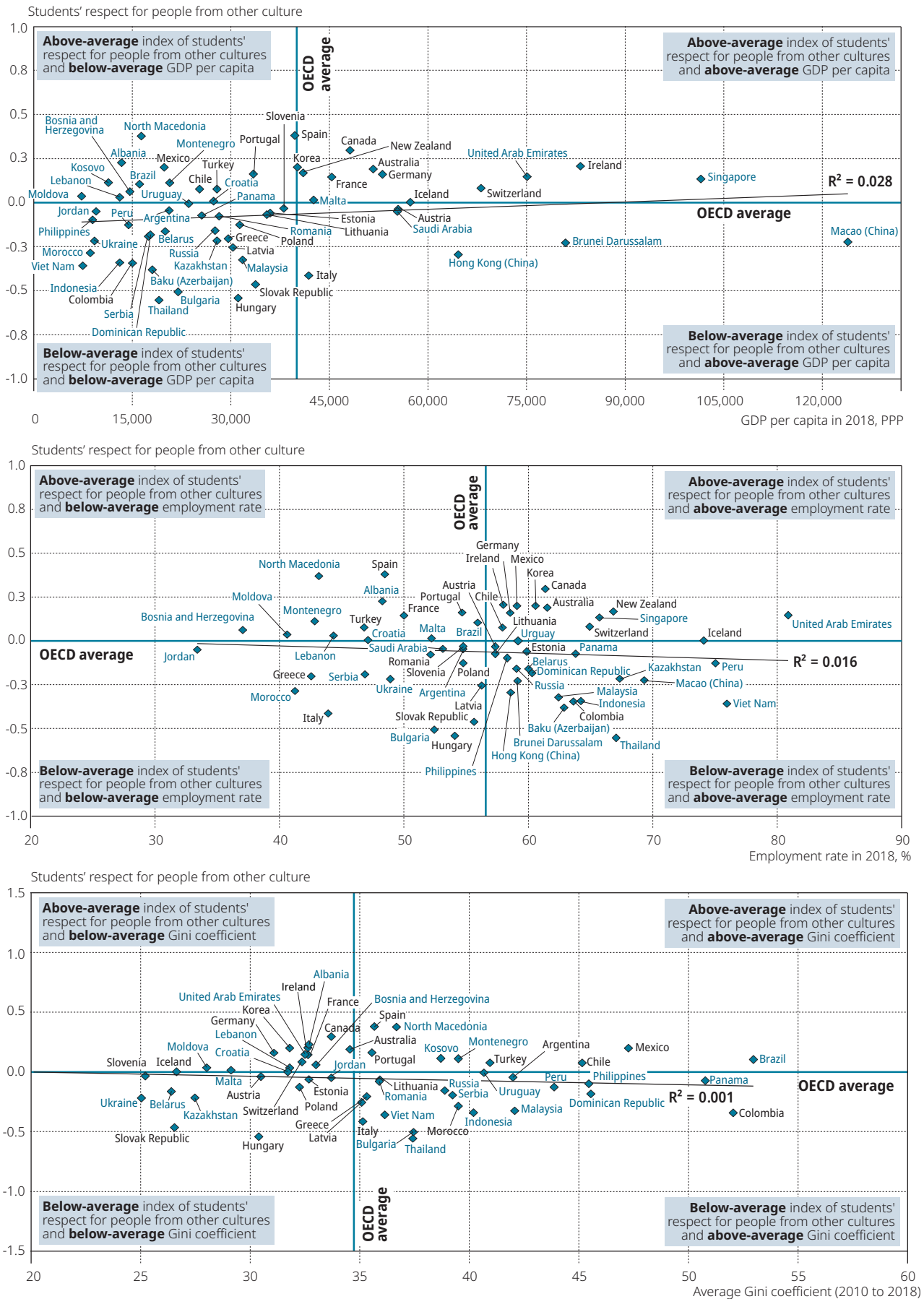
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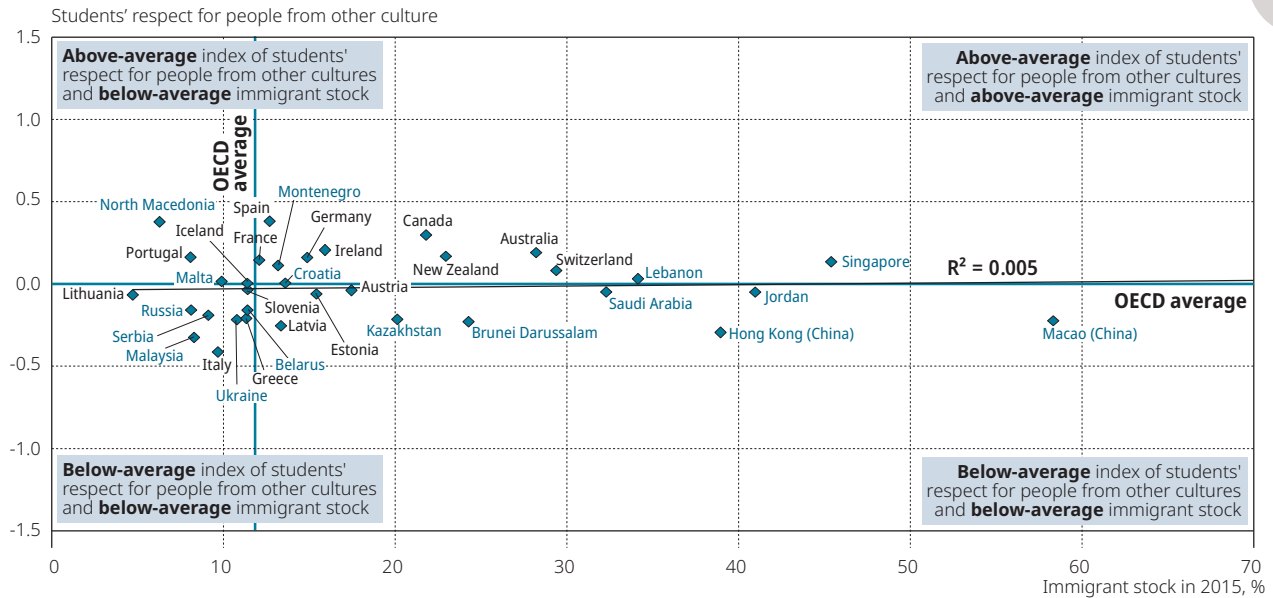
The absence of associations between students' attitudes and system-level variables reflects the fact that countries/economies on the opposite sides of the scatterplots are cancelling out each other's effects.

Figure VI.6.13 shows a positive but weak association between students' respect for people from other cultures and the GDP per capita in countries/economies. Countries/economies with high per capita GDP and high student-reported levels of respect for people from other cultures include Australia, Canada, Ireland and the United Arab Emirates. No associations were observed between employment rate, proportion of immigrants and income Gini coefficient and respect for people from other cultures.

Countries/economies with higher student-reported levels of respect for people from other cultures and a high employment rate include Australia, Canada, Korea, New Zealand and Singapore. Those with higher student-reported levels of respect for people from other cultures and a high proportion of immigrants include Australia, Canada, Ireland and New Zealand. Those with higher student-reported levels of respect for people from other cultures and low income inequalities include Albania, Germany, Ireland and Korea.

Figure VI.6.13 Students' respect for people from other cultures and their surrounding circumstances





Note: The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

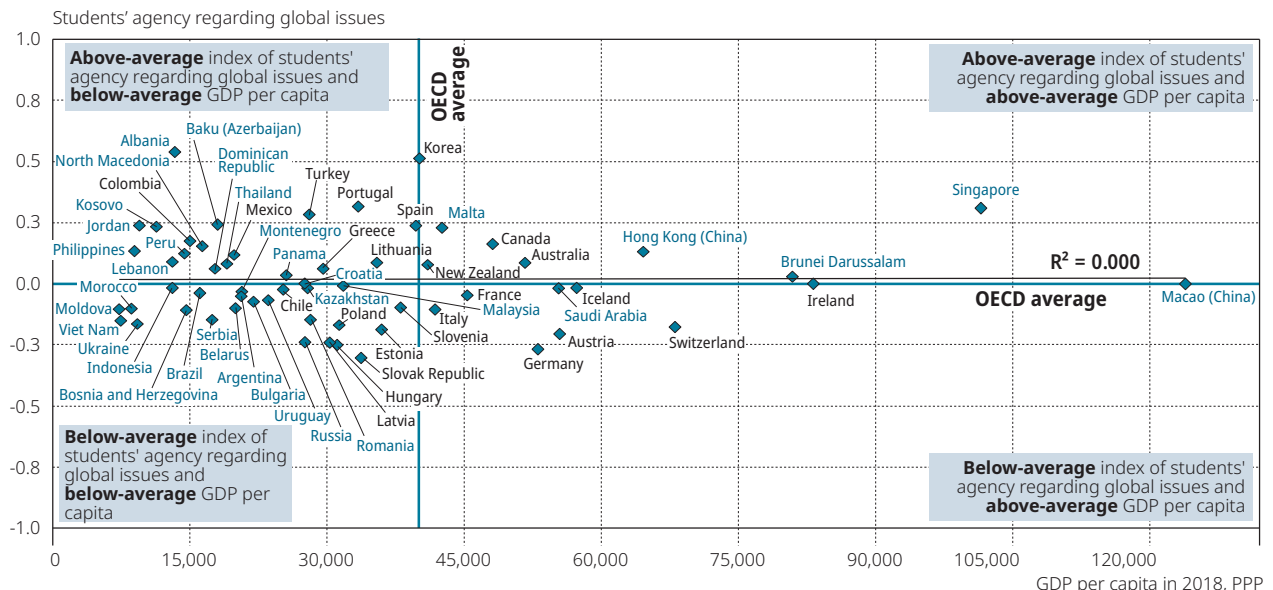
Source: OECD, PISA 2018 Database, Table VI.B1.6.6.

StatLink <https://doi.org/10.1787/888934170488>

Students' agency regarding global issues was not found to be correlated with GDP per capita and with the income Gini coefficient (Figure VI.6.14). Countries/economies with the highest levels of GDP per capita and whose students' exhibited strong agency regarding global issues include Korea, Singapore and Spain. Countries/economies with more income equality and students who report stronger agency regarding global issues include Albania, Korea, Malta and Jordan.

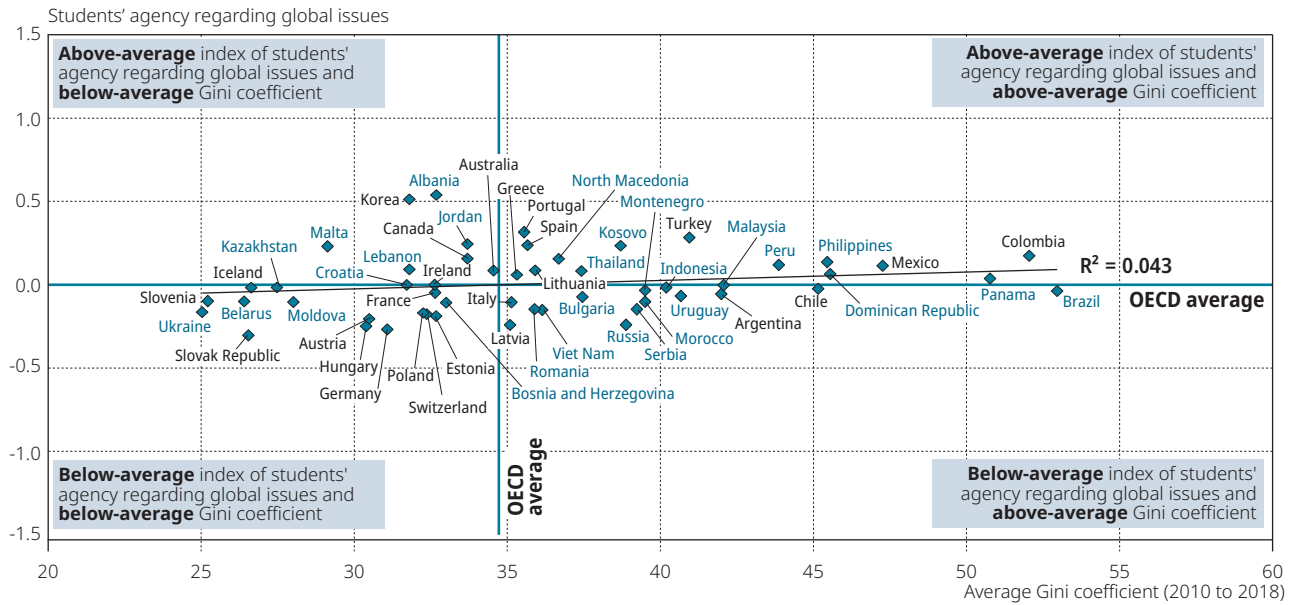
Similarly, no associations were observed between students' awareness and self-efficacy regarding global issues and a country's or economy's GDP per capita (Figure VI.6.15). Countries/economies with the highest levels of GDP per capita and whose students' reported the greatest awareness of global issues include Australia, Canada, Malta and the United Arab Emirates. Those whose students reported the highest levels of self-efficacy regarding global issues include Canada, Germany, Singapore and the United Arab Emirates.

Figure VI.6.14 Students' agency regarding global issues and their surrounding circumstances



6

The links between the knowledge, skills and attitudes needed to thrive in an interconnected world

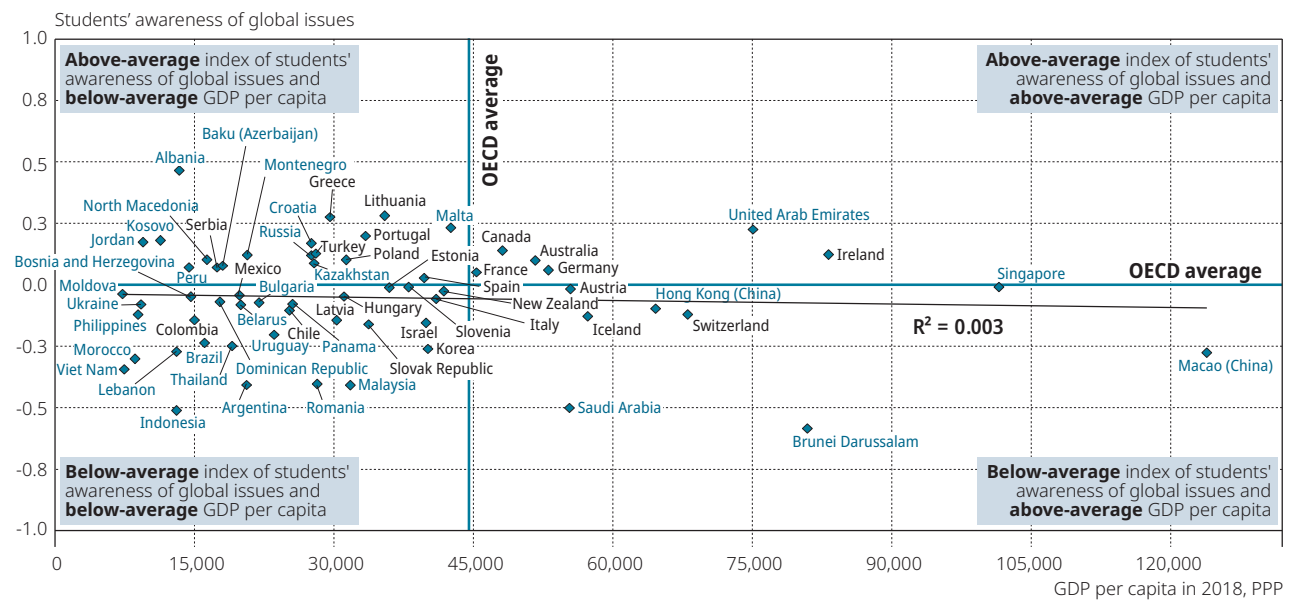


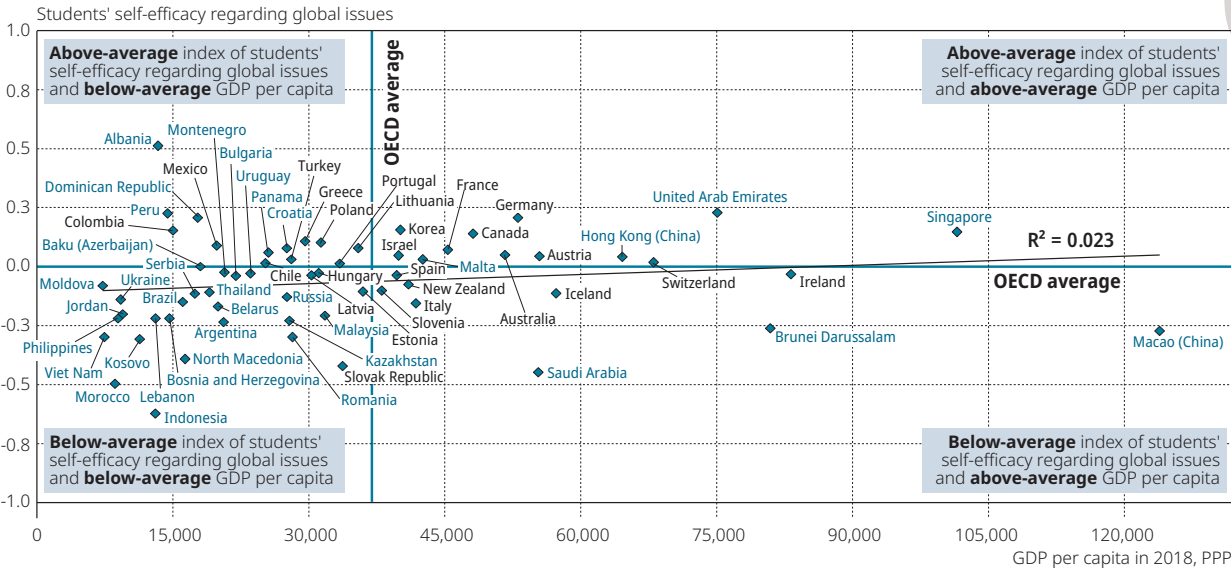
Note: The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

Source: OECD, PISA 2018 Database, Table VI.B1.6.6.

StatLink <https://doi.org/10.1787/888934170507>

Figure VI.6.15 **Students' awareness of and self-efficacy regarding global issues and their surrounding circumstances**





Note: The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

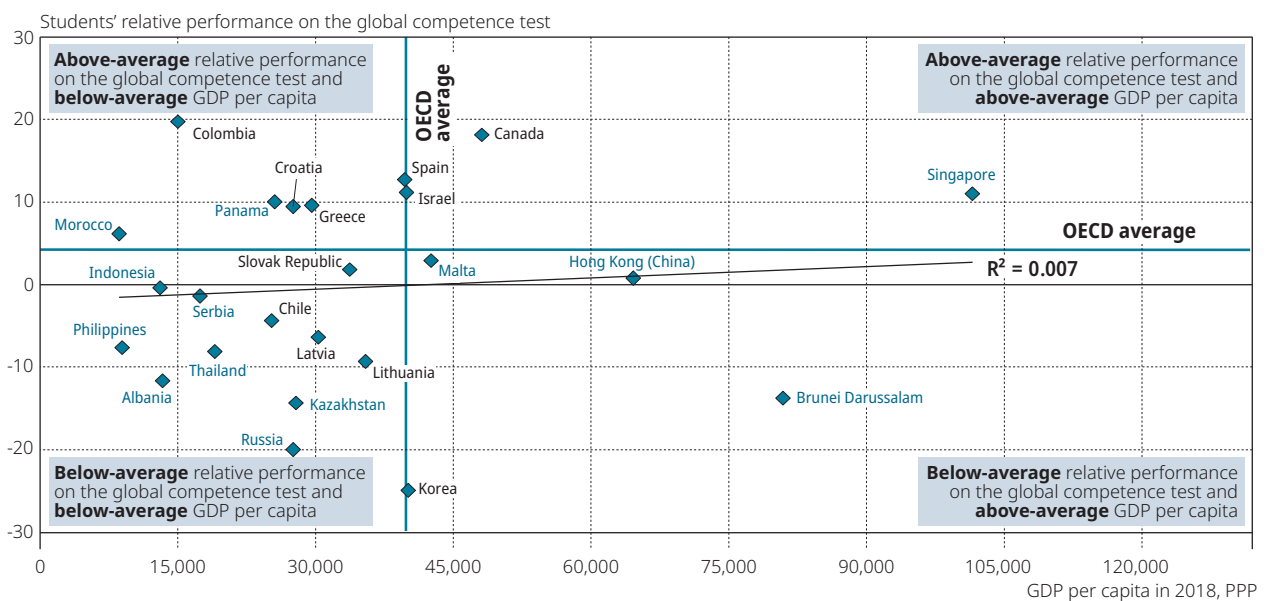
Source: OECD, PISA 2018 Database, Table VI.B1.6.6.

StatLink <https://doi.org/10.1787/888934170526>

Finally, Figure VI.6.16 shows the association between relative performance on the global competence cognitive test (after accounting for students' performance in reading, science and mathematics) and four system-level characteristics. A positive but modest association is observed between students' relative performance on the test on the one hand and the income Gini coefficient and immigrant stock in 2015 on the other. A negative but weak association was observed with employment rate, and no association was observed with per capita GDP.

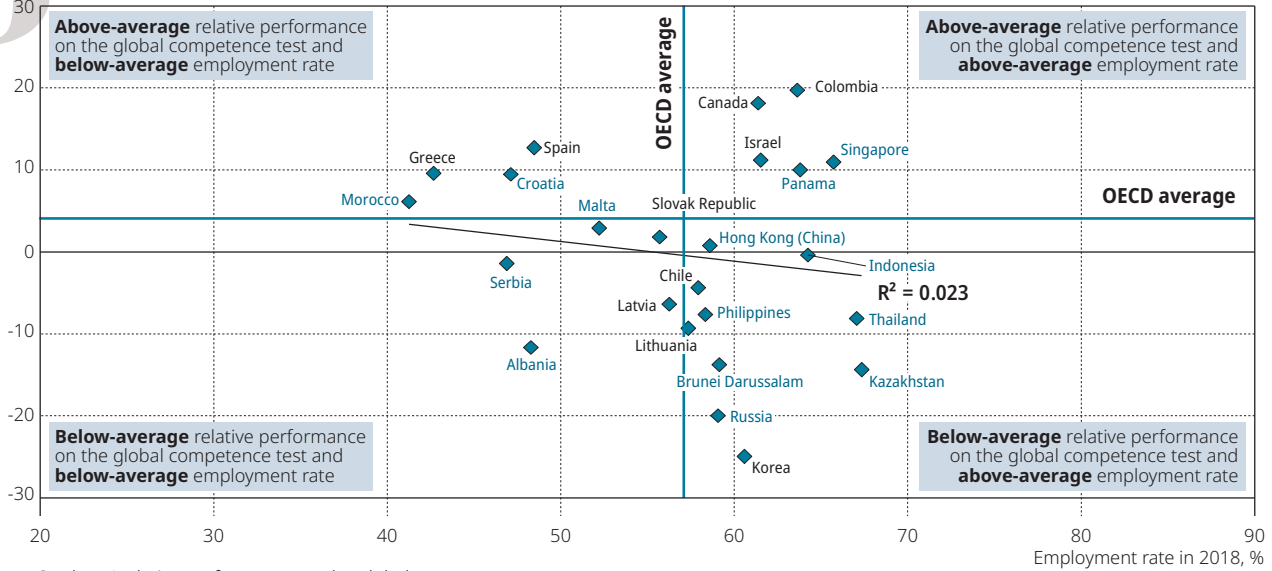
Countries/economies with high per capita GDP and high students' relative performance on the global competence test include Canada, Israel, Singapore and Spain. The opposite is observed in Thailand and Albania. Colombia stands out as the only country with low per capita GDP but relatively high student performance on the test. In contrast, Brunei Darussalam and Korea have high per capita GDP but low relative performance on the test. Countries/economies with high levels of employment and high relative performance on the test include Canada, Colombia, Israel and Singapore, while countries/economies with a large proportion of immigrants (exceeding 20%) and a high relative performance on the test include Canada, Israel and Singapore. When it comes to income inequalities, Canada stands out as the country with lower inequalities and high relative performance on the test, while the Philippines and Russia show high income inequality and low relative performance.

Figure VI.6.16 **Students' relative performance on the global competence test and their surrounding circumstances**

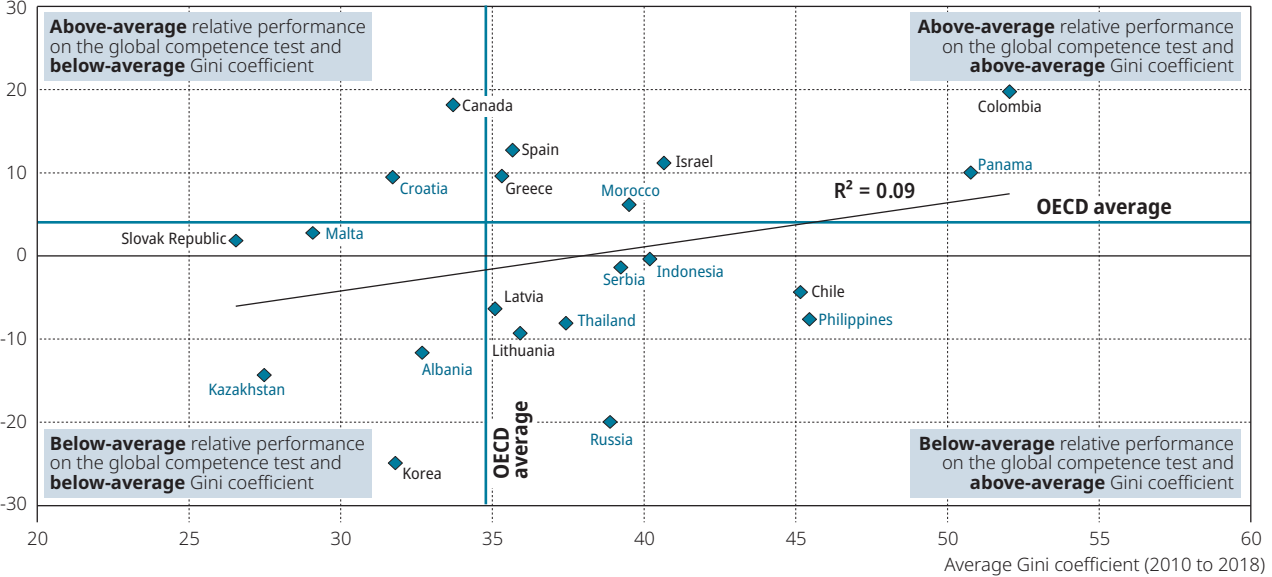


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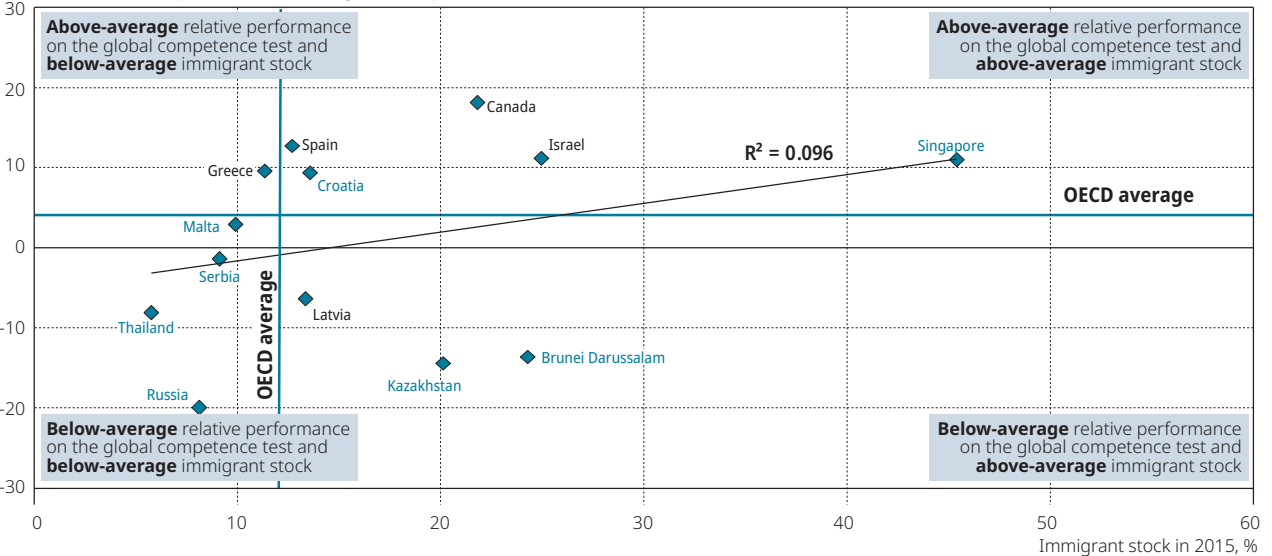
Students' relative performance on the global competence test



Students' relative performance on the global competence test



Students' relative performance on the global competence test



Note: The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.

Source: OECD, PISA 2018 Database, Table VI.B1.6.6.

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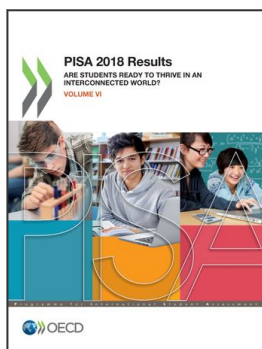
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Note

1. The global competence sample from Israel does not include students in ultra-Orthodox schools and, thus, is not nationally representative. See PISA 2018 Technical Report (OECD, forthcoming) for details.
2. Given that the test items can be reported on a unidimensional scale, results in this chapter are presented using the scaled plausible values on all global competence dimensions combined.
3. The PISA 2018 global competence performance scores were scaled to have an average of 500 score points across OECD countries and a standard deviation of 100 score points.
4. In addition to the five proficiency levels, some students scored below Level 1.
5. A linear ordinary least squares regression of performance in global competence over performance in reading, mathematics and science was performed. The student's relative performance was then defined as his or her actual performance in global competence minus his or her predicted performance in global competence or, in other words, the residual of the regression. One of the properties of the regression, to ensure that the predictions are not biased, is that the average residual (or relative performance) is equal to 0. Senate weights were adjusted so that all countries and economies contributed equally to the regression.
6. Data from the World Bank on Gini Coefficients were averaged over the period of 2010 to 2018, because some countries did not have data for some years. Averaging does not affect the validity of the data, as Gini coefficients and income inequalities do not change much over a short period of time.

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From:

PISA 2018 Results (Volume VI)

Are Students Ready to Thrive in an Interconnected World?

Access the complete publication at:

<https://doi.org/10.1787/d5f68679-en>

Please cite this chapter as:

OECD (2020), “The links between the knowledge, skills and attitudes needed to thrive in an interconnected world”, in *PISA 2018 Results (Volume VI): Are Students Ready to Thrive in an Interconnected World?*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/3aee52e-en>

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