



Excellence and equity



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PISA in brief - 2015

In 2015, over half a million students...

- representing 28 million 15-year-olds in 72 countries/economies

... took an internationally agreed 2-hour test...

- Goes beyond testing whether students can reproduce what they were taught to assess students' capacity to extrapolate from what they know and creatively apply their knowledge in novel situations
- Total of 390 minutes of assessment material

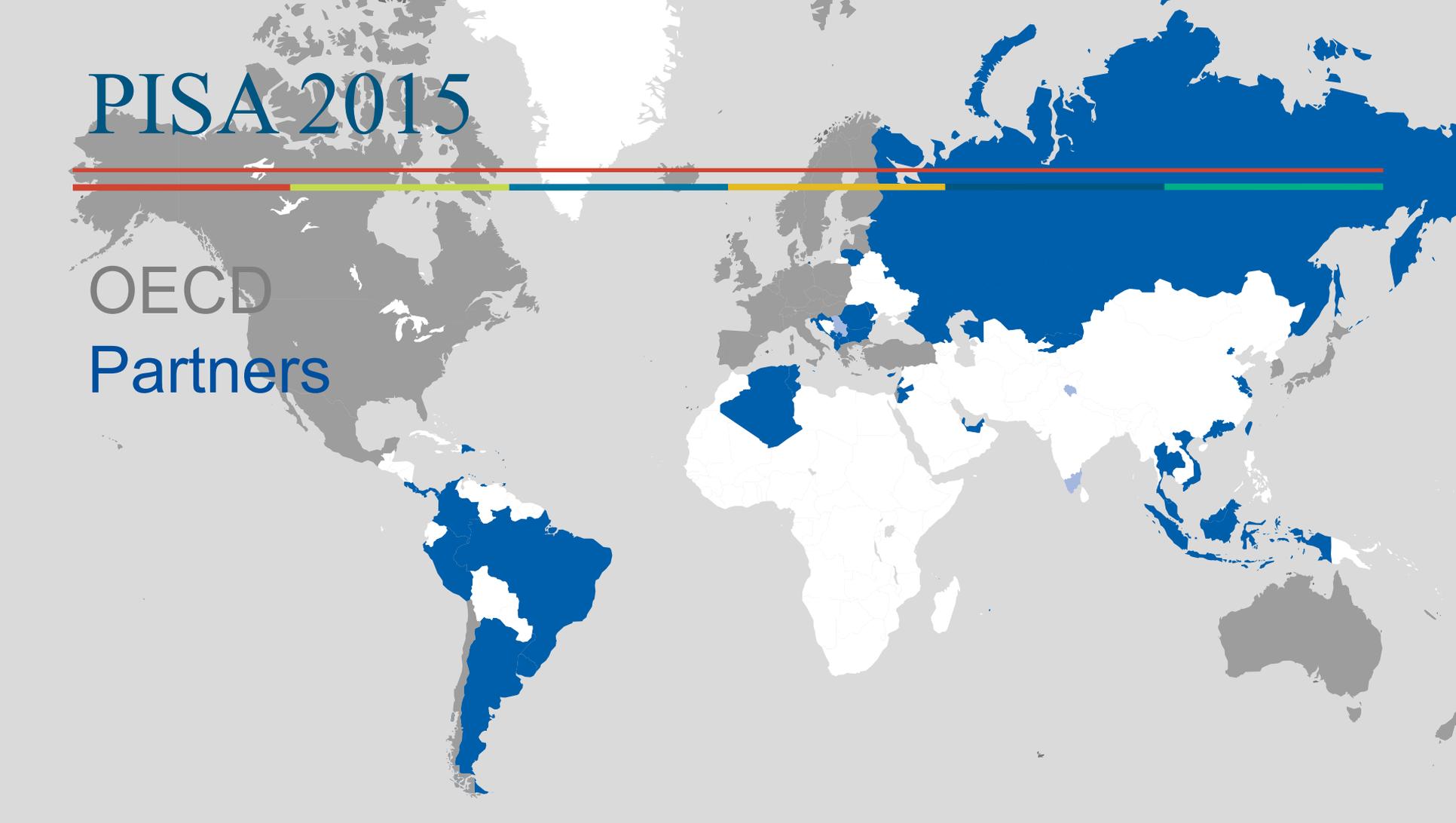
... and responded to questions on...

- their personal background, their schools, their well-being and their motivation

Parents, principals, teachers and system leaders provided data on:

- school policies, practices, resources and institutional factors that help explain performance differences
- 89,000 parents, 93,000 teachers and 17,500 principals responded

PISA 2015

A world map where countries are colored in shades of blue and grey. Dark blue highlights OECD member countries, including most of North America, Europe, and parts of Asia and South America. Lighter blue highlights Partner countries, including Mexico, Chile, Colombia, Jordan, and several countries in Africa, Asia, and South America. Grey represents countries that are neither OECD members nor partners. A horizontal bar with a red, yellow, and green gradient is positioned below the title.

OECD
Partners



Science in PISA

“the ability to engage with science-related issues, and with the ideas of science, as a reflective citizen”





Sustainable Fish Farming

Question 1 / 4

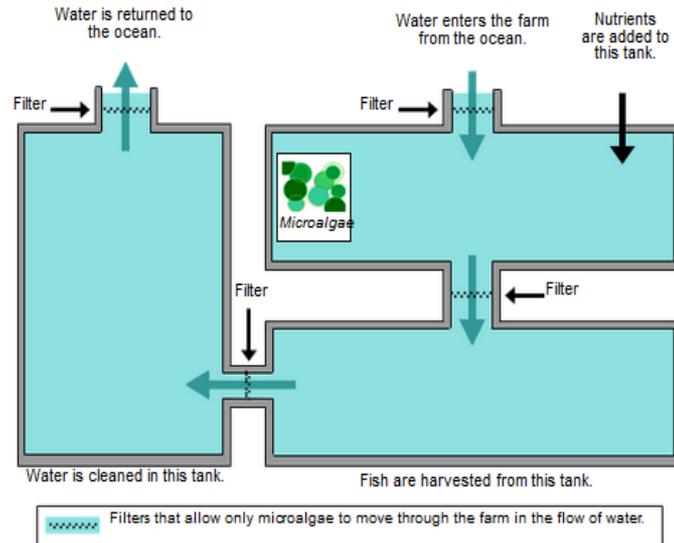
Refer to the information below. Use drag and drop to answer the question.

The diagram shows a design for an experimental fish farm with three large tanks. Filtered salt water is pumped from the ocean before flowing from tank to tank until it is returned to the ocean. The primary goal of the fish farm is to grow common sole to be harvested in a sustainable way.

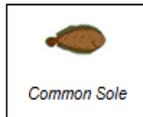
- **Common Sole:** The fish being farmed. Their preferred food is ragworms.

The following organisms will also be used in the farm:

- **Microalgae:** Microscopic organisms that only need light and nutrients to grow.
- **Ragworms:** Invertebrates that grow very rapidly on a diet of microalgae.
- **Shellfish:** Organisms that feed on microalgae and other small organisms in the water.
- **Marsh Grass:** Grasses that absorb nutrients and wastes from the water.



The researchers need to decide in which tank each organism should be placed. Drag and drop each of the organisms below to the appropriate tank above to ensure that the Common Sole is fed and that salt water is returned to the ocean unchanged. The microalgae are already in the correct tank.



Drag Ragworms and Common Sole into Tank 2 and Marsh Grass and Shellfish into Tank 3

This question requires students to understand a system and the role of several organisms within that system. In order to answer correctly, students must understand the goal of the fish farm, the function of each of the three tanks therein, and which organisms will best fulfill each function. Students must use information provided in the stimulus and the diagram, including a footnote under the diagram

Trends in science performance

570

550

530

510

490

470

450

Student performance

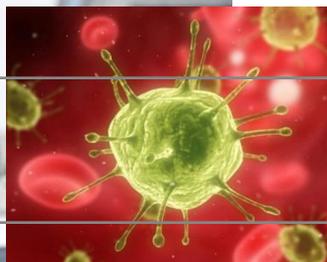
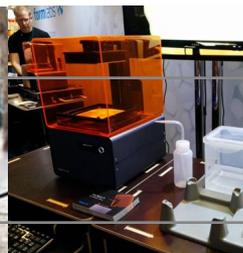
OECD average

2006

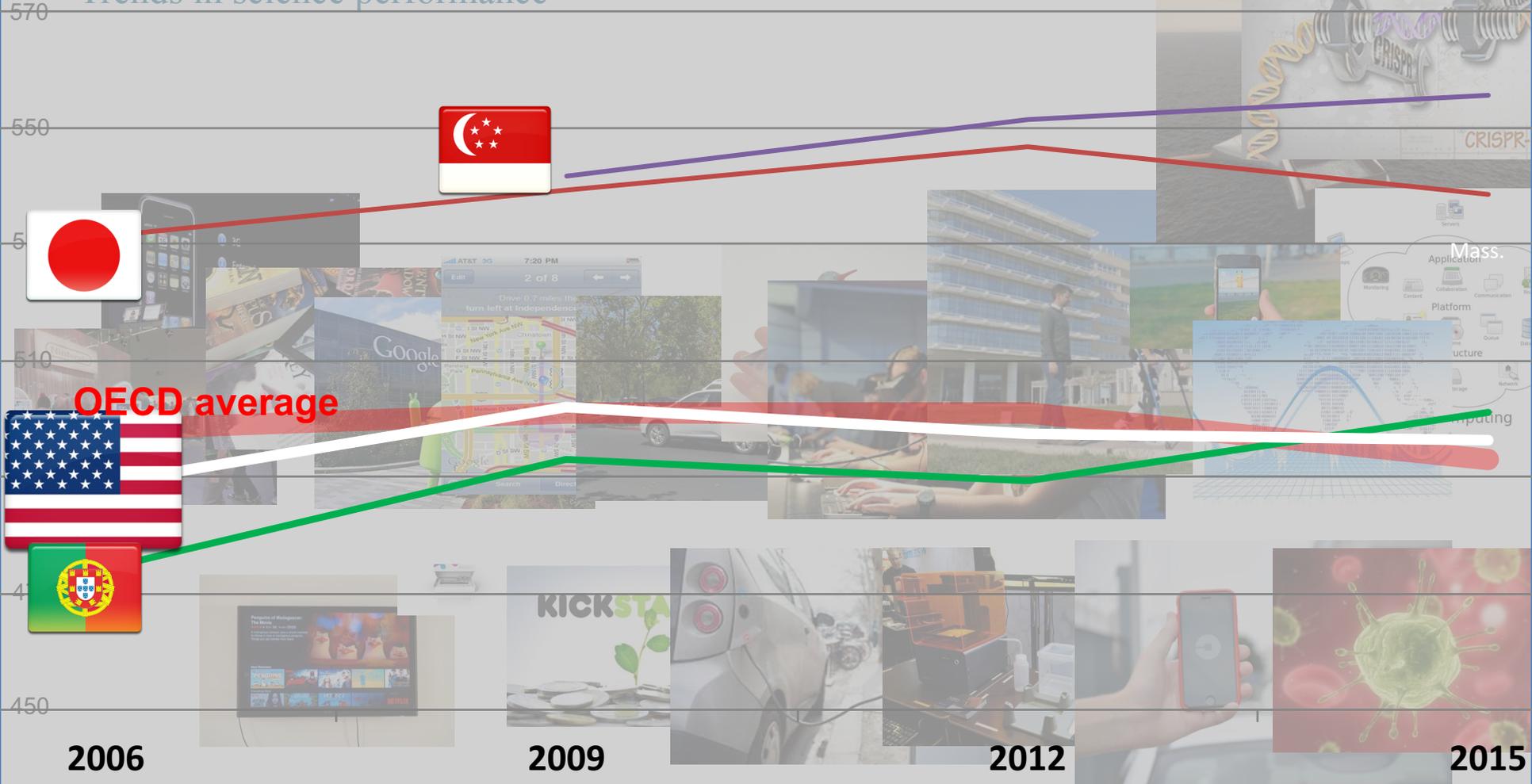
2009

2012

2015



Trends in science performance



OECD average

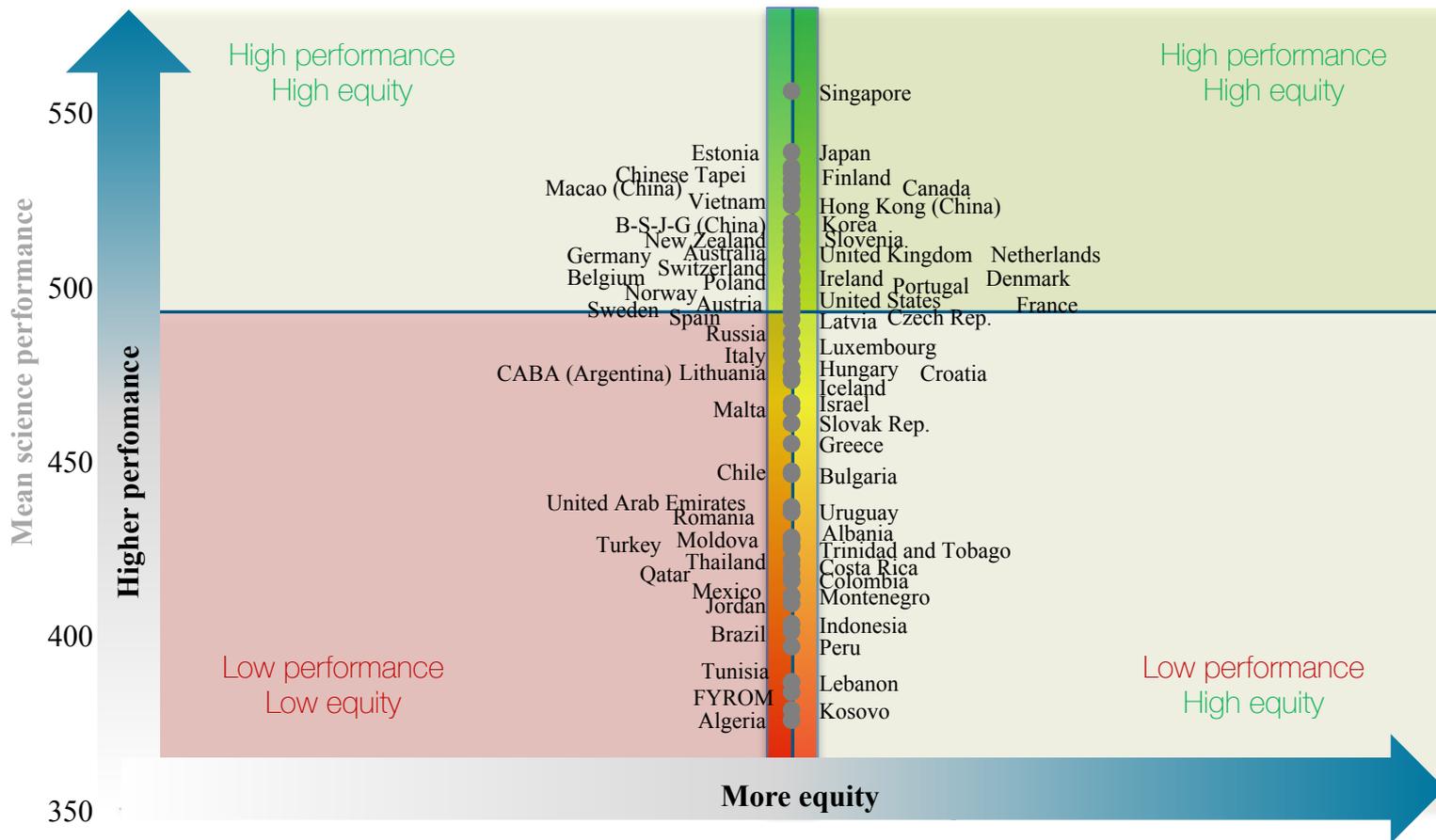
2006

2009

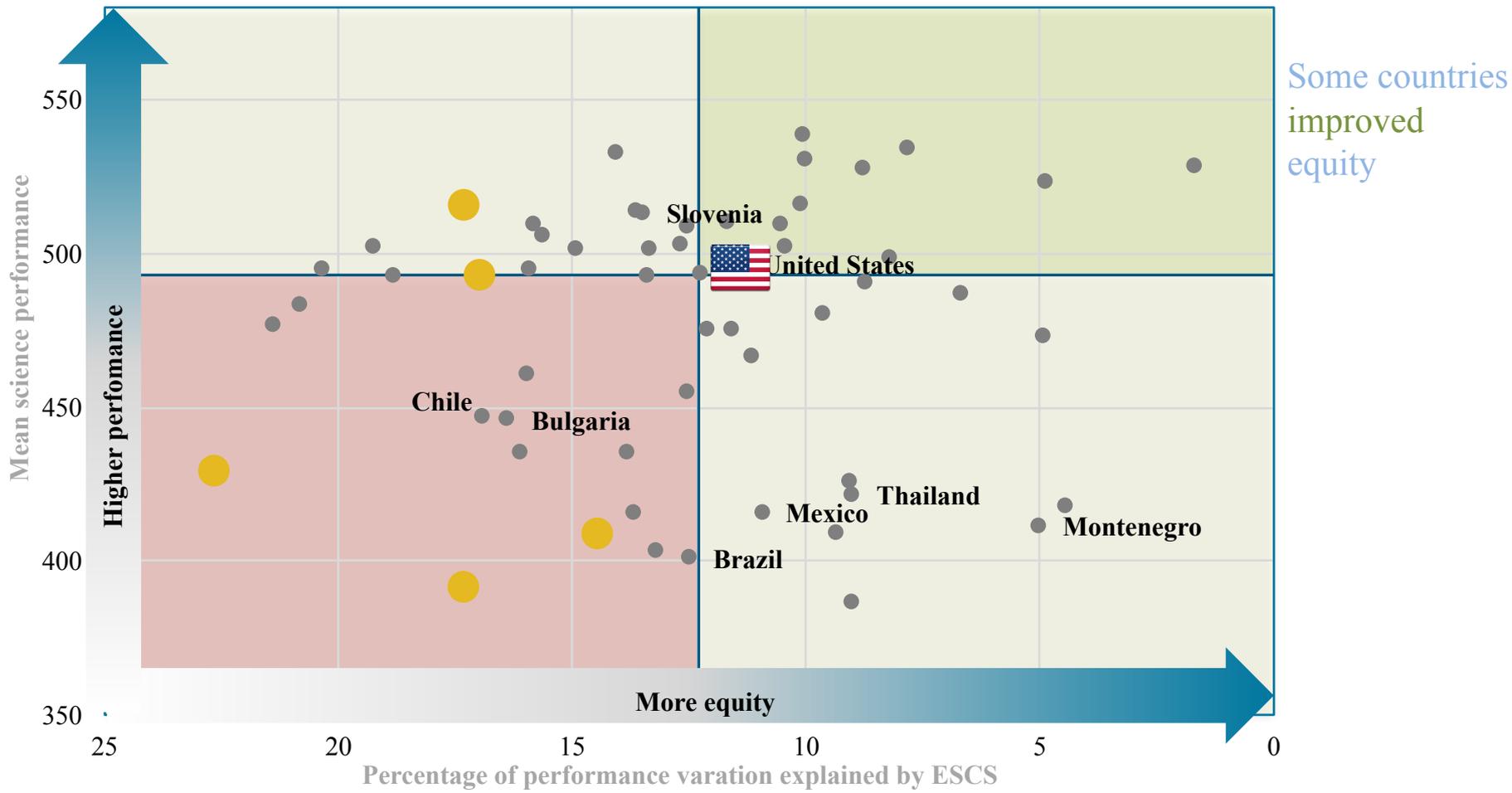
2012

2015

Science performance in PISA (2015)



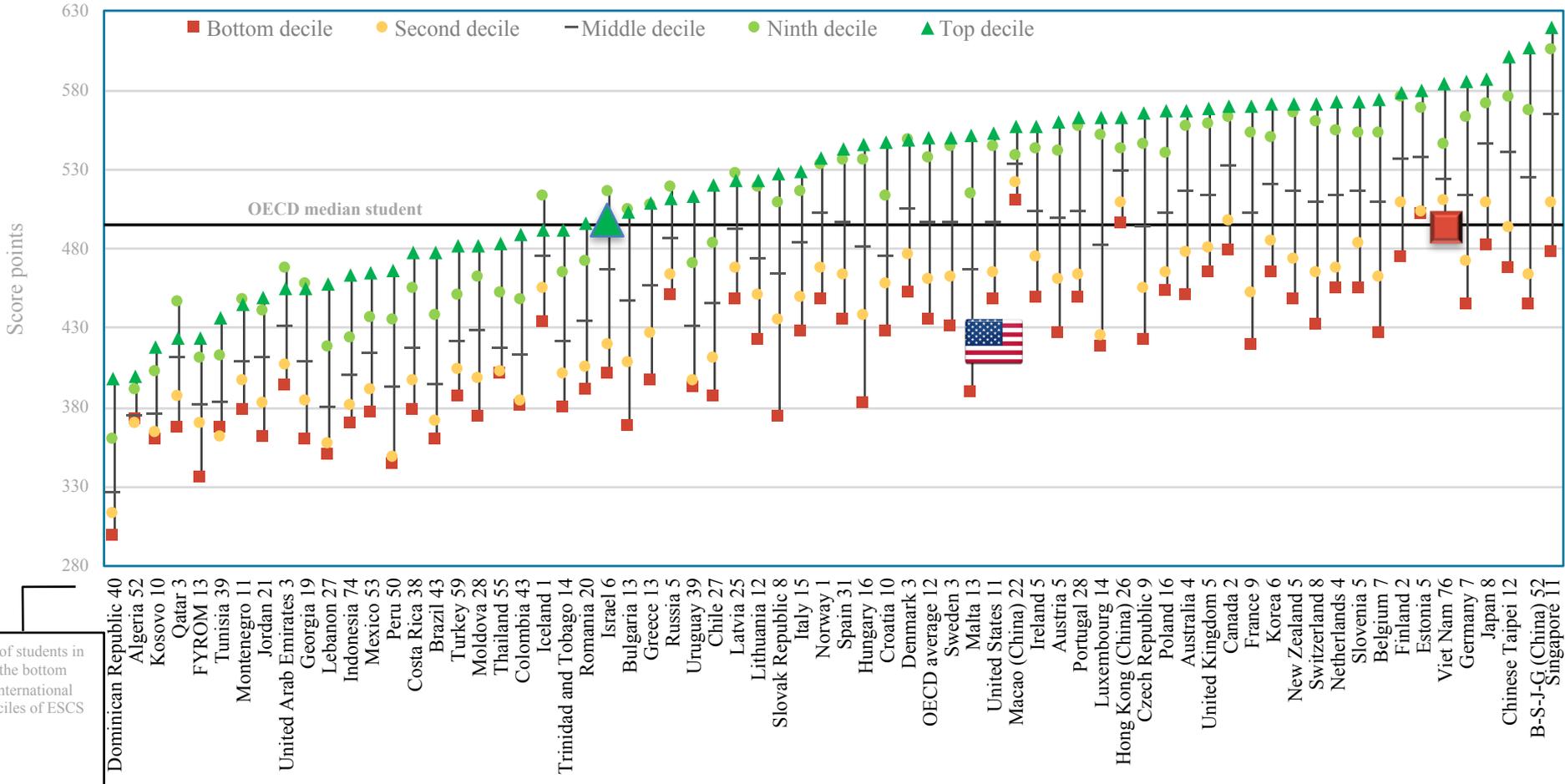
Science performance and equity in PISA (2006-2015)



Science performance,

by international deciles of the PISA index of economic, social and cultural status (ESCS)

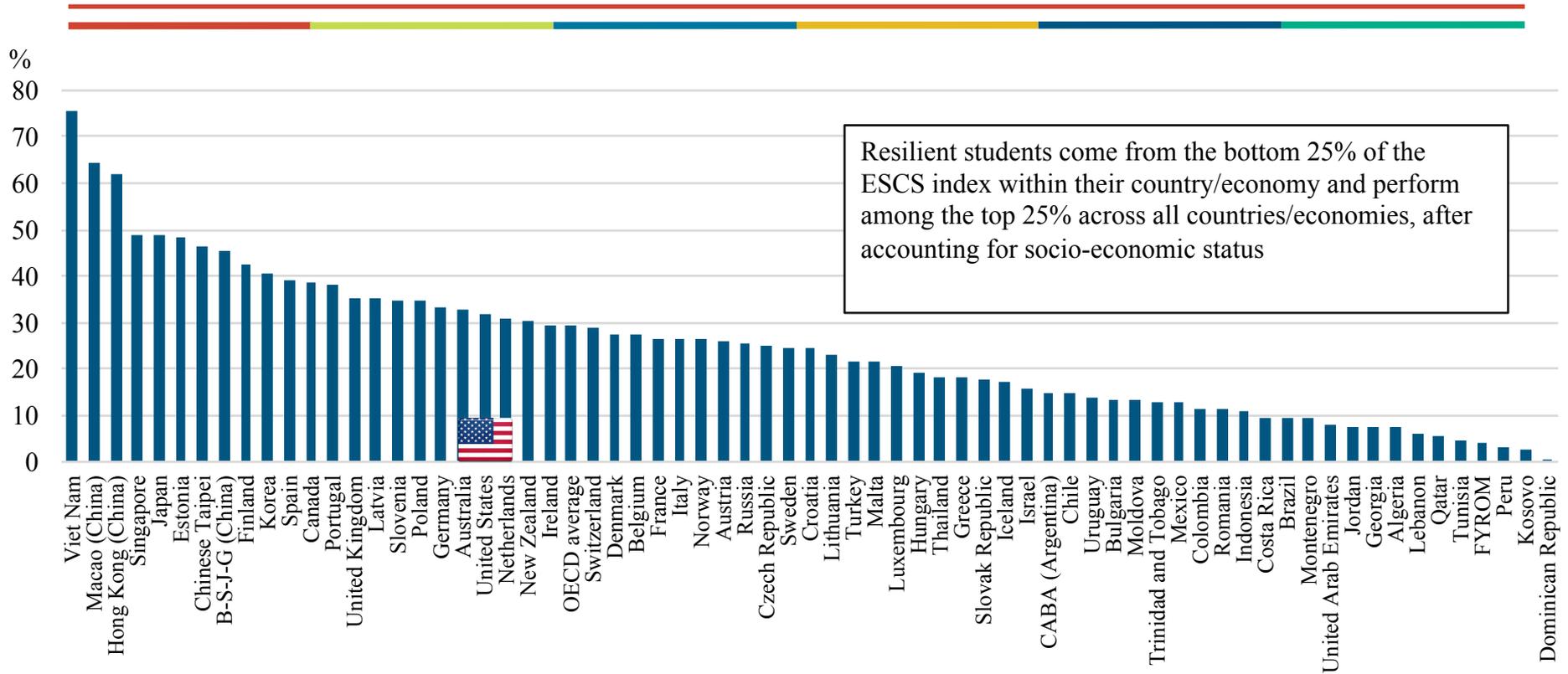
Figure I.6.7



% of students in the bottom international deciles of ESCS

Figure I.6.10

Percentage of resilient students



Excellence and baseline performance



Percentage of top-performers and low-achieving students in science (2006 and 2015)

Figure I.2.26

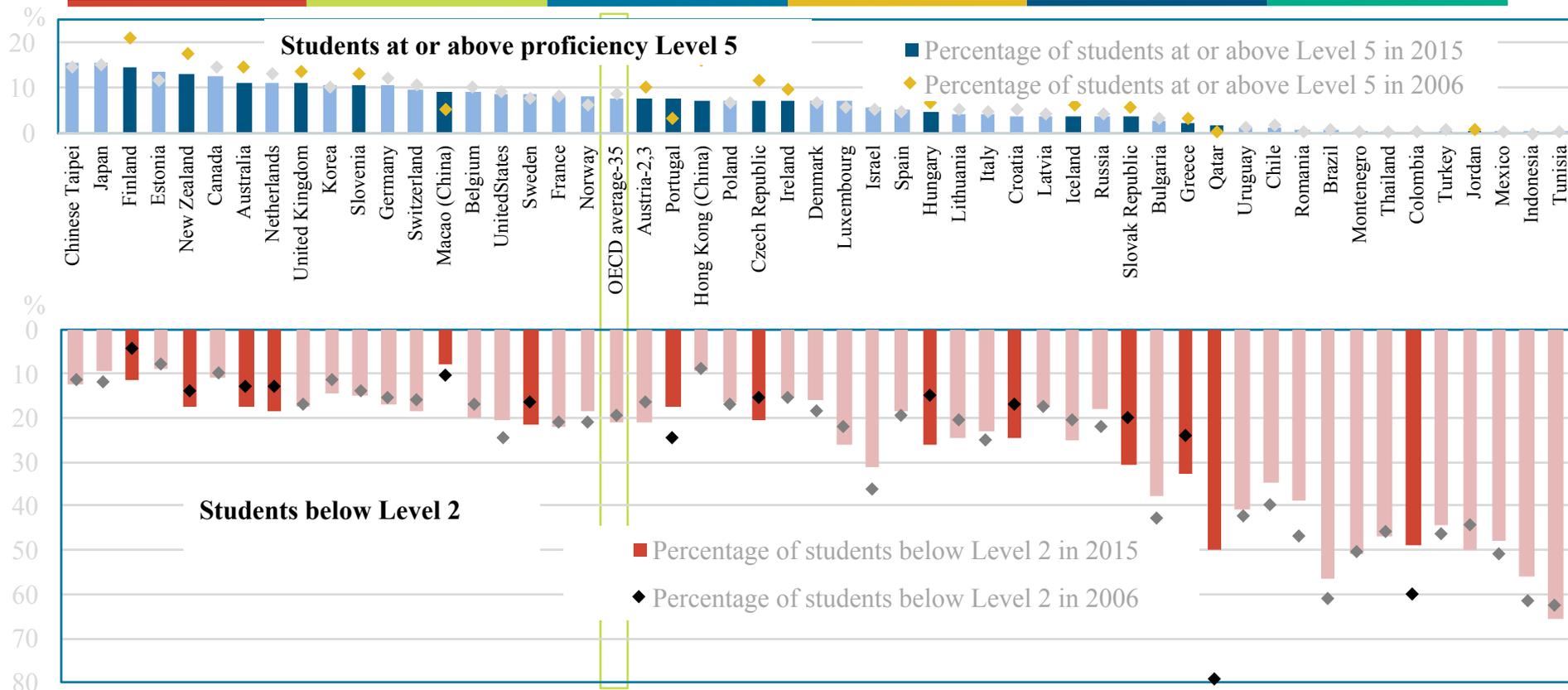
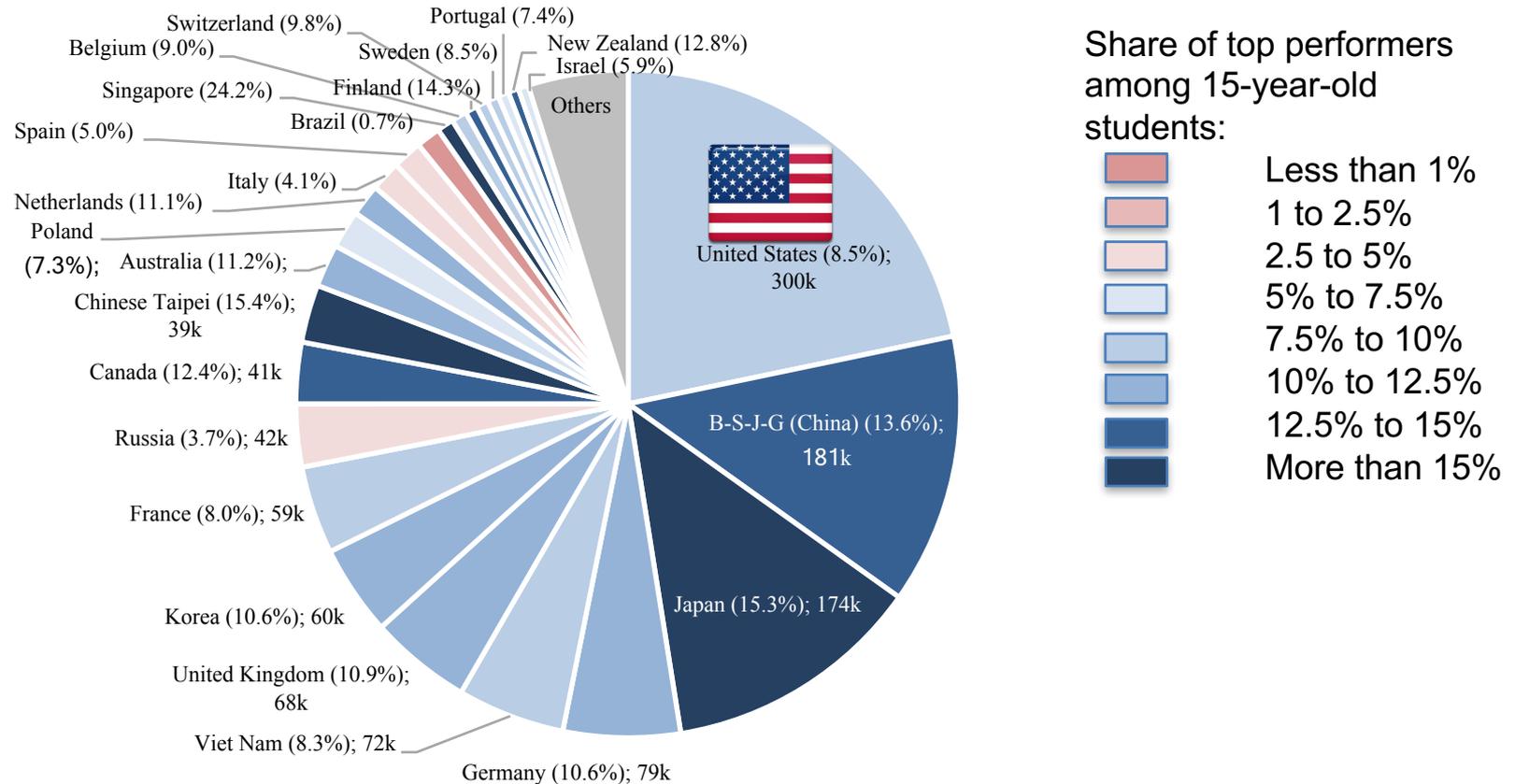


Figure I.2.18

The global pool of top performers: A PISA perspective



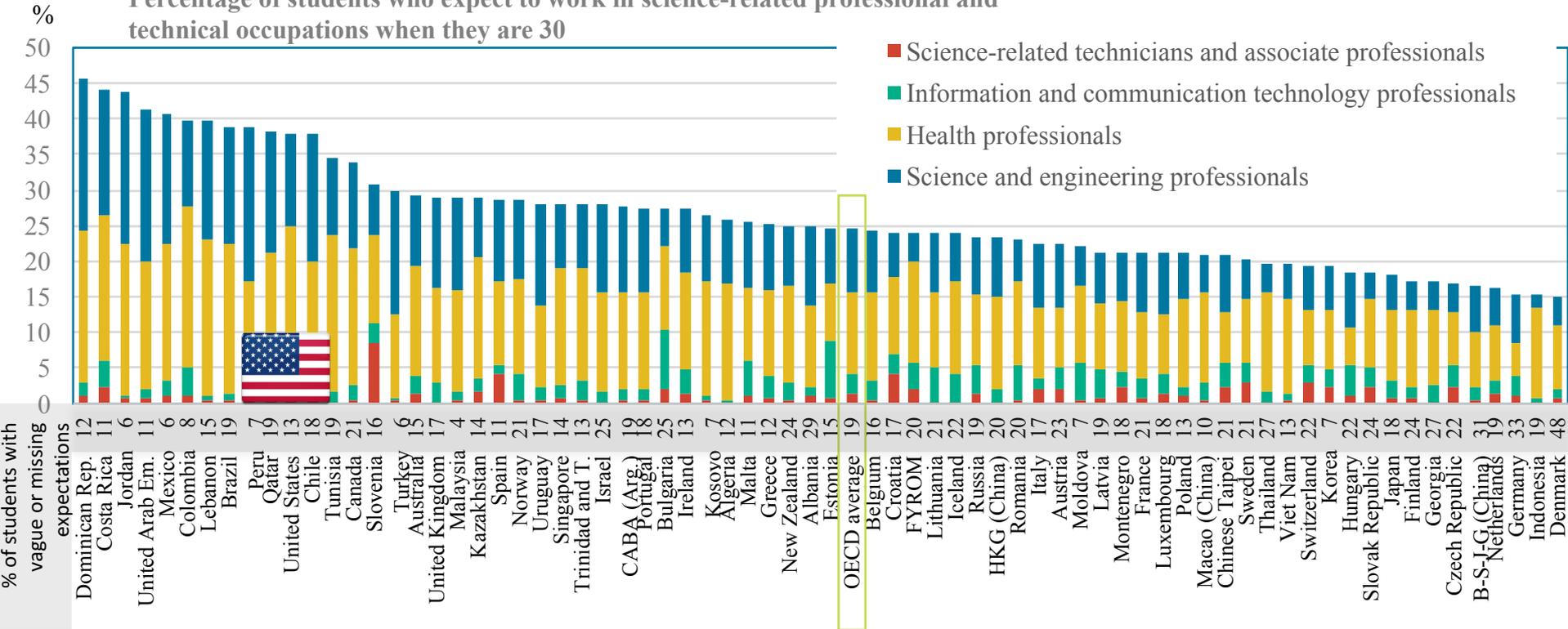
Science and careers



Figure I.3.2

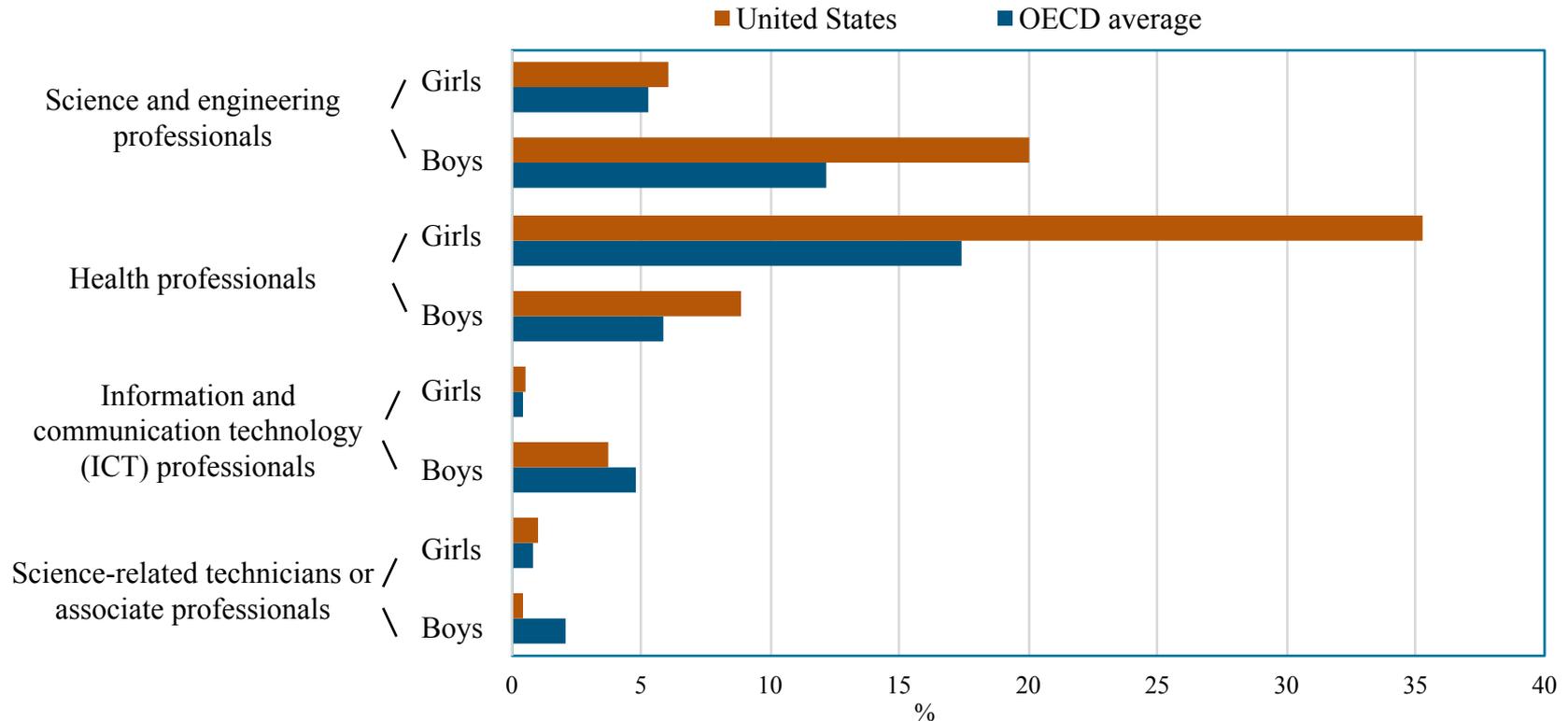
Students' career expectations

Percentage of students who expect to work in science-related professional and technical occupations when they are 30



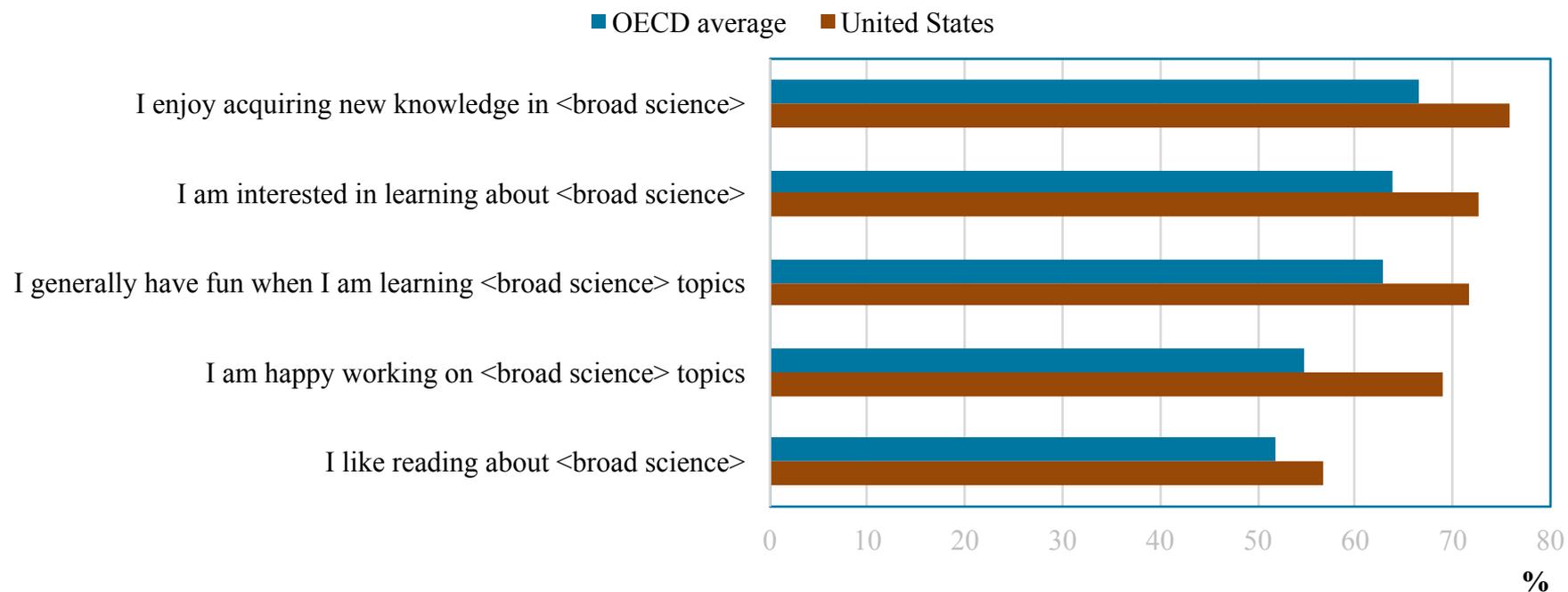
Expectations of a science career by gender

Figure I.3.5



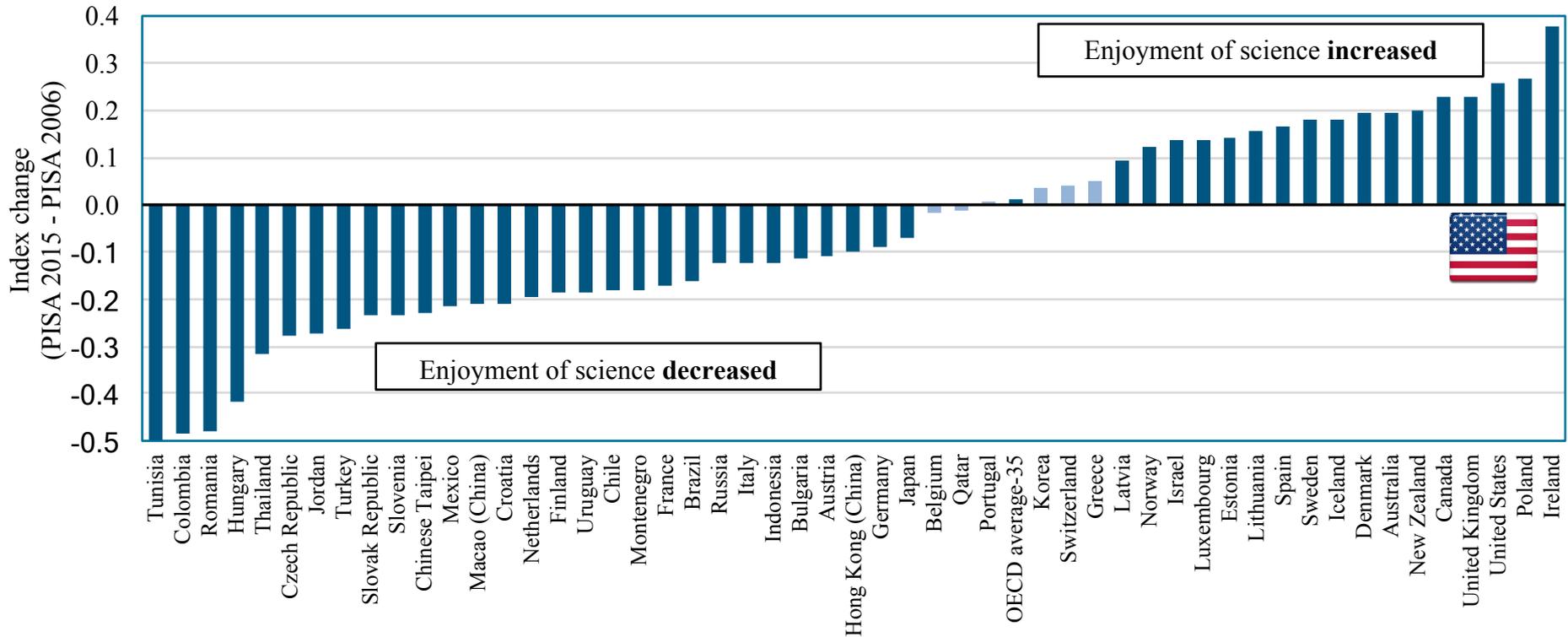
Students' enjoyment of learning science

Percentage of students who reported that they "agree" or "strongly agree" with the following statements



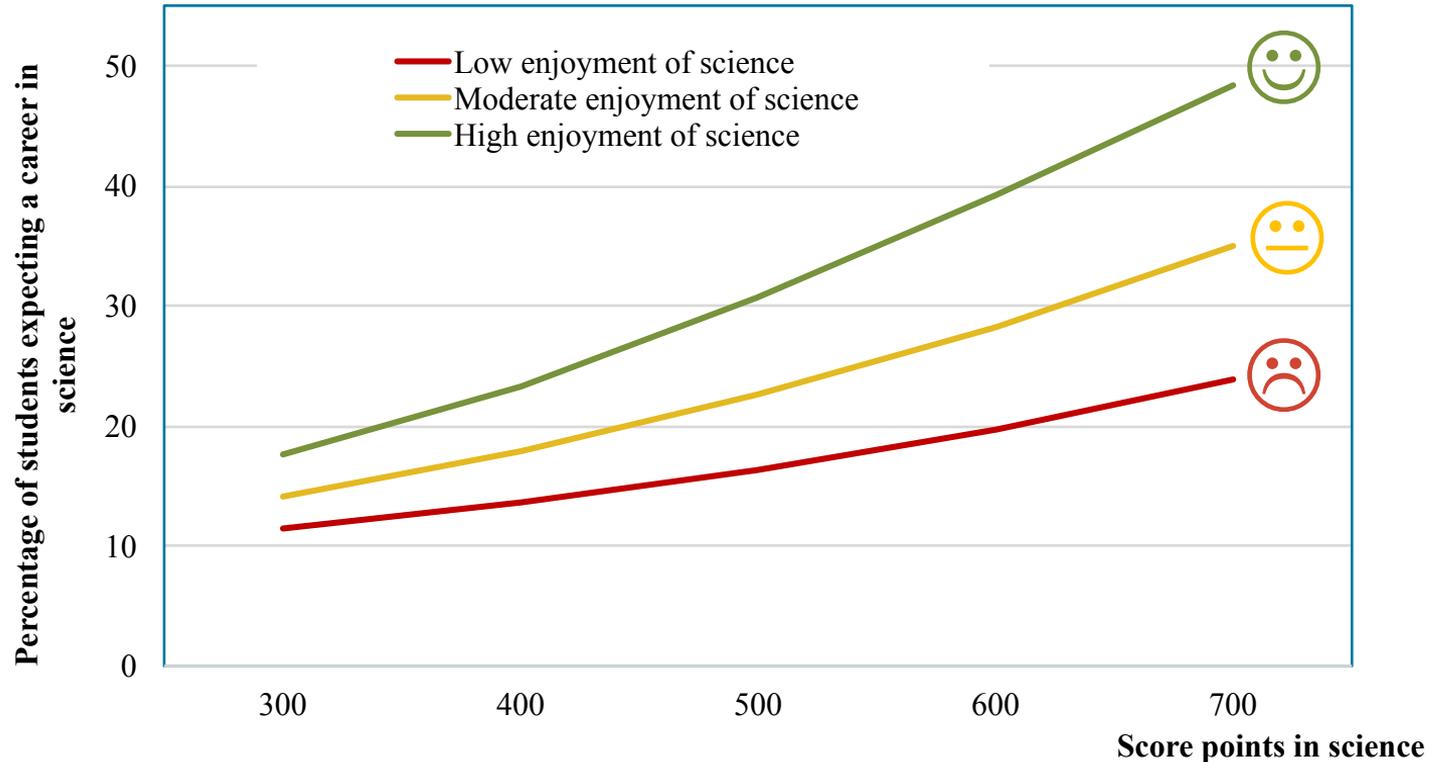
Change between 2006 and 2015 in students' enjoyment of learning science

Figure I.3.10

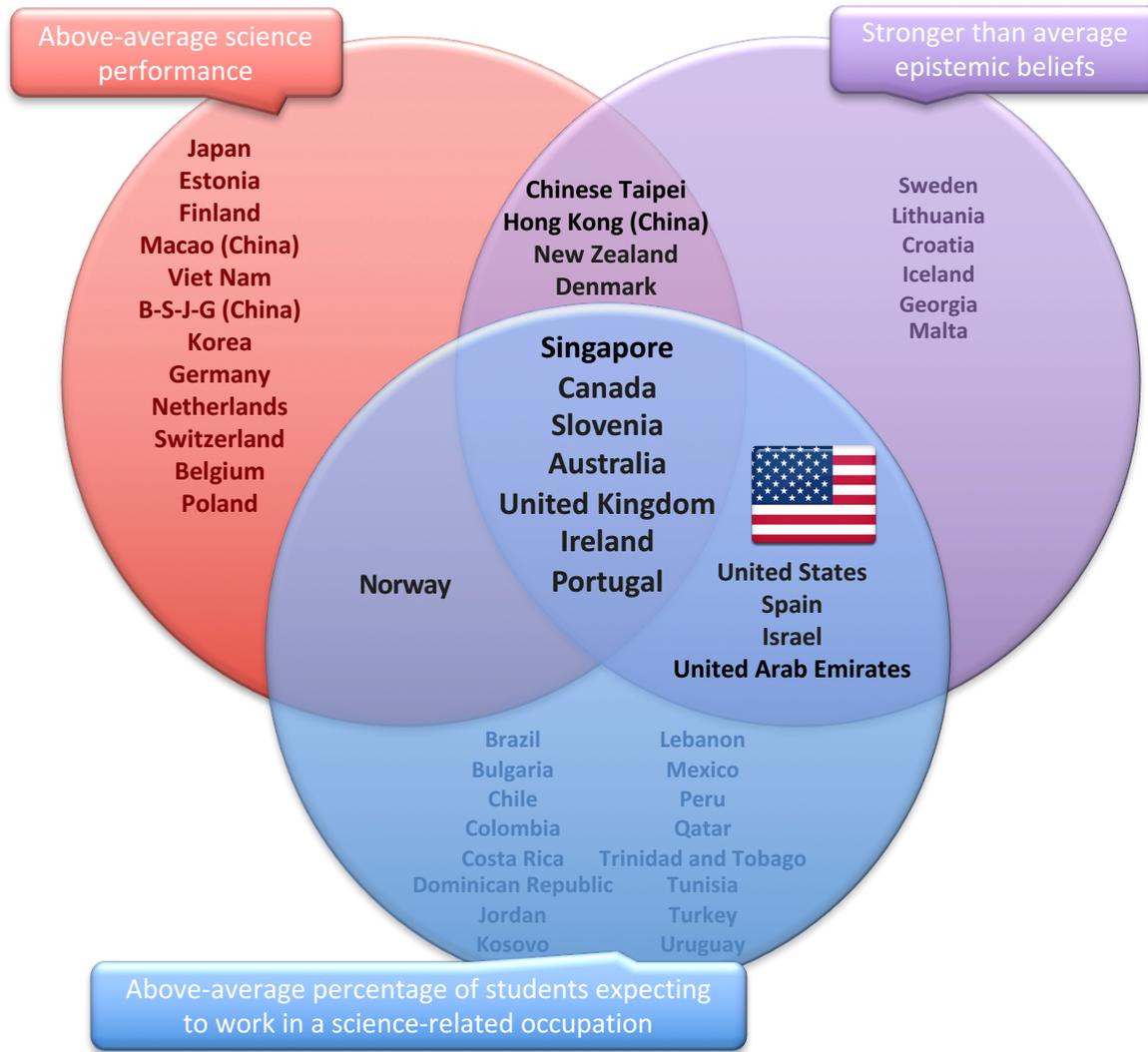


Students expecting a career in science

by performance and enjoyment of learning



Multiple outcomes



Spending per student from the age of 6 to 15 and science performance

Figure II.6.2

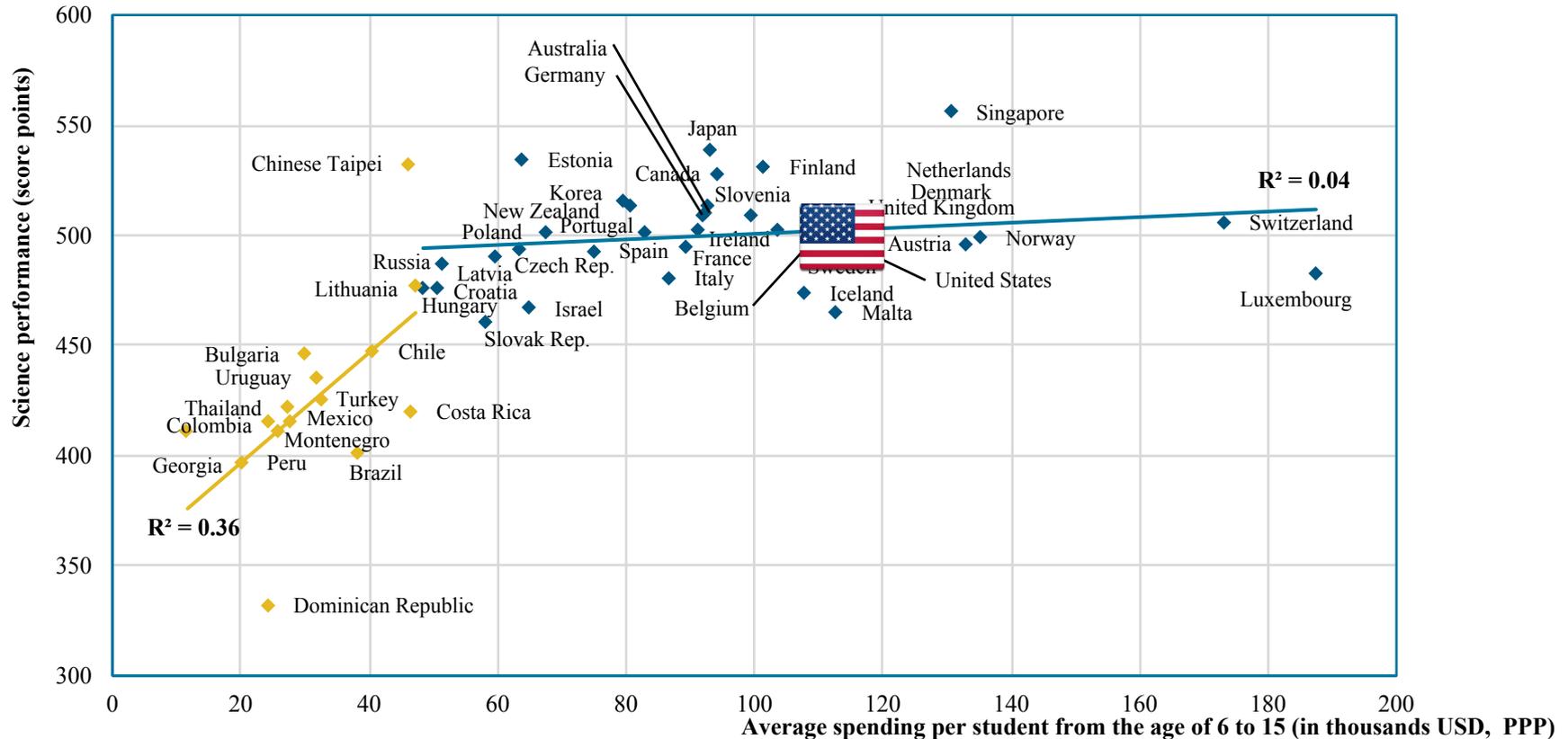
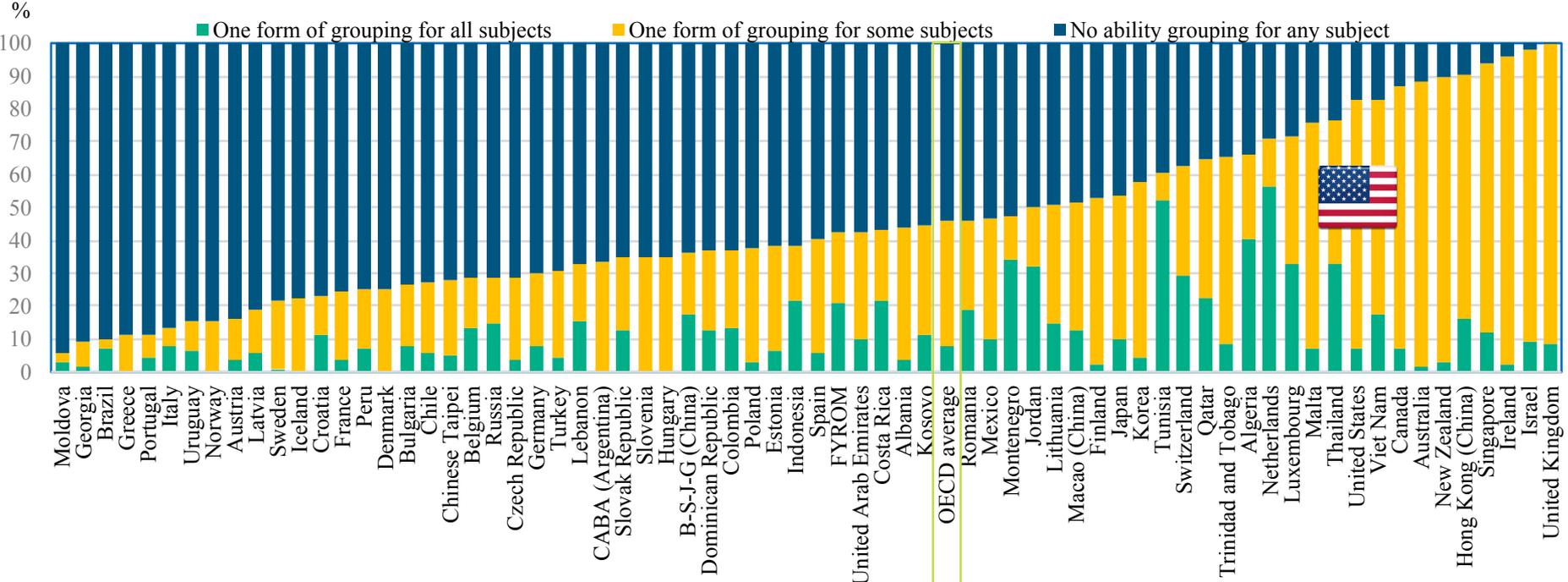


Figure II.5.8

Horizontal stratification: ability grouping

Percentage of students in schools where students are grouped by ability into different classes:



Public and private schools

Across OECD countries, 84% of students attend public schools, 12% government-dependent private schools and 4% independent private schools
PISA generally observes no systematic net performance differences

Science performance in public and private schools

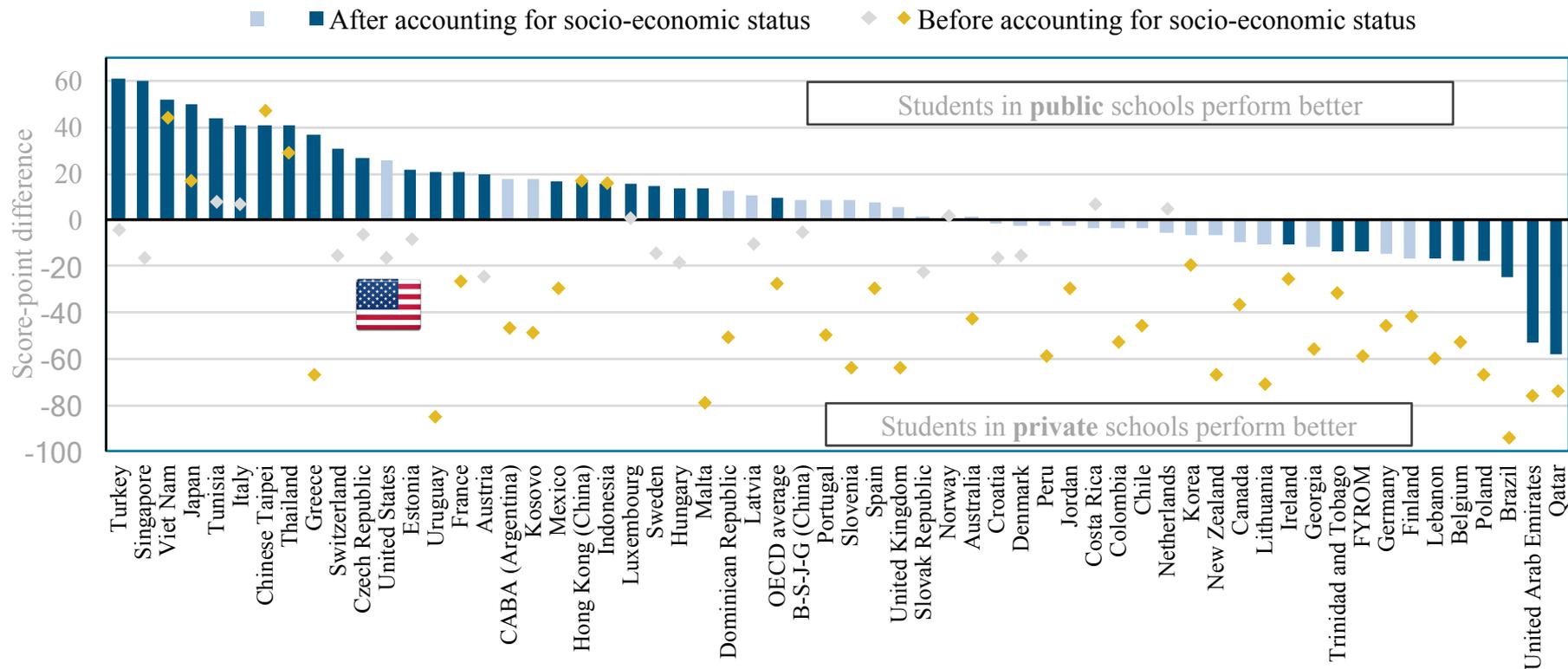
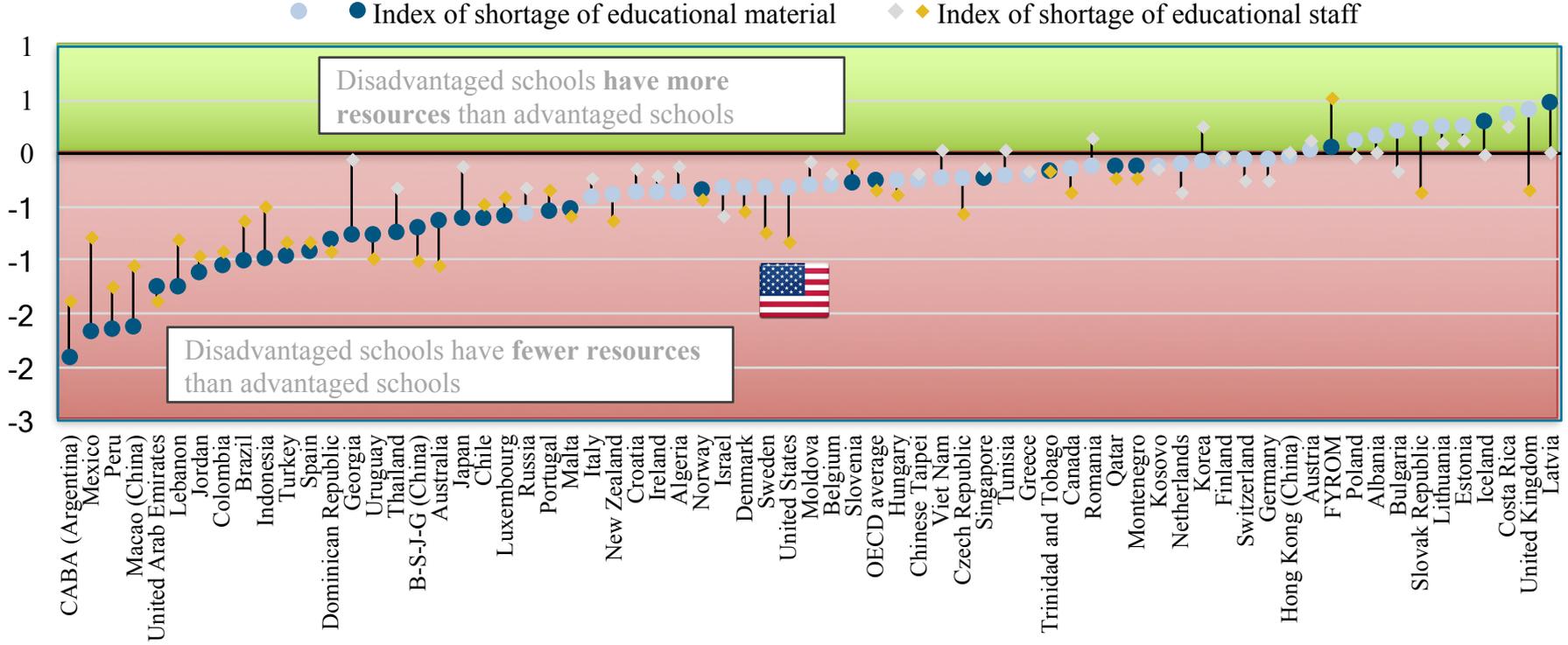


Figure I.6.14

Differences in educational resources between advantaged and disadvantaged schools

Mean index difference between advantaged and disadvantaged schools



Integrating immigrants



Figure I.7.4

Student performance in science

by immigrant background

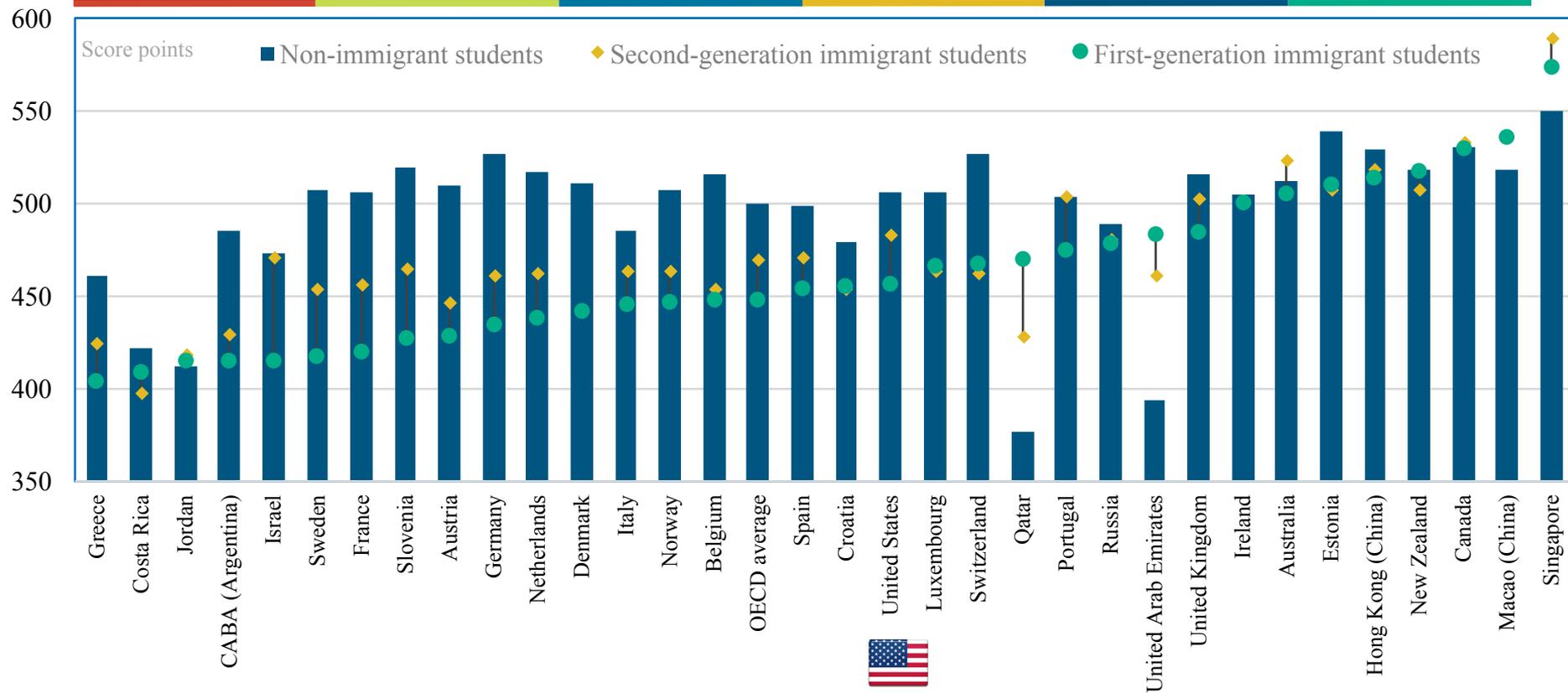
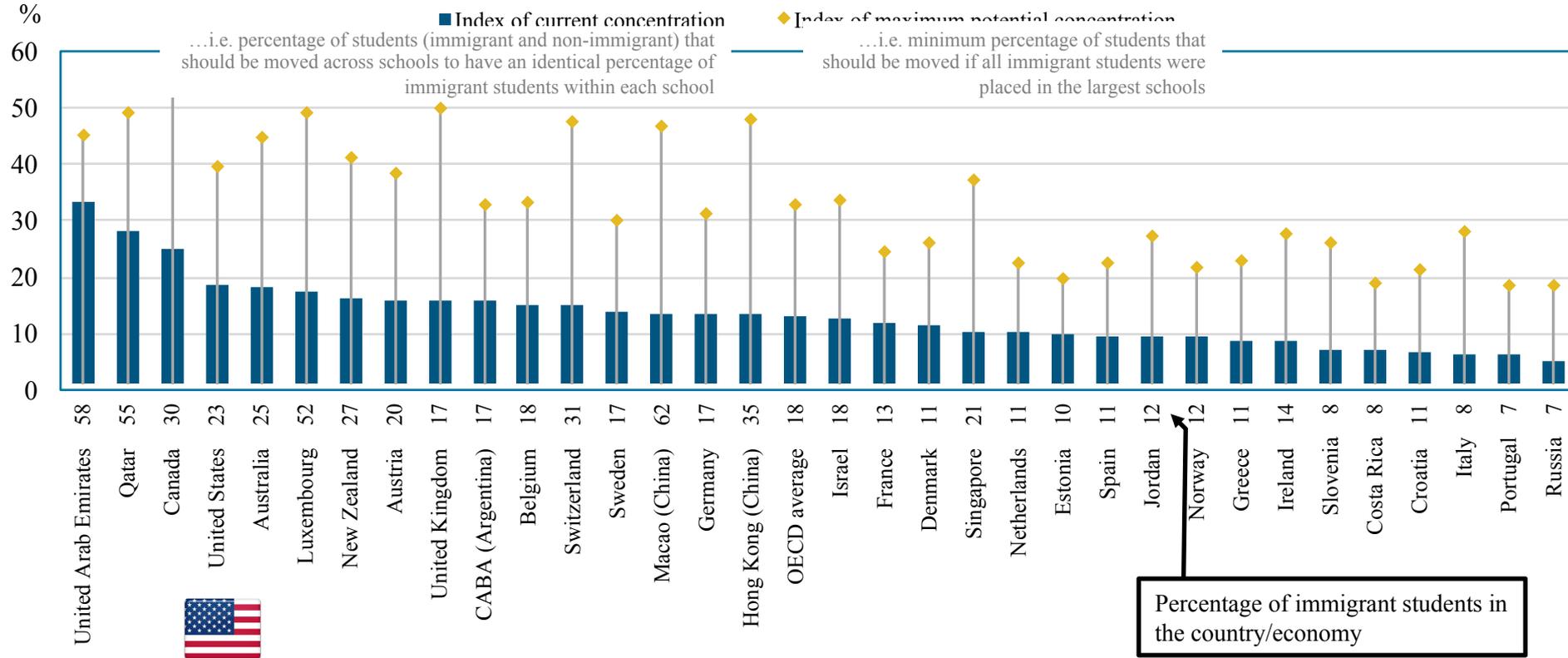


Figure I.7.11

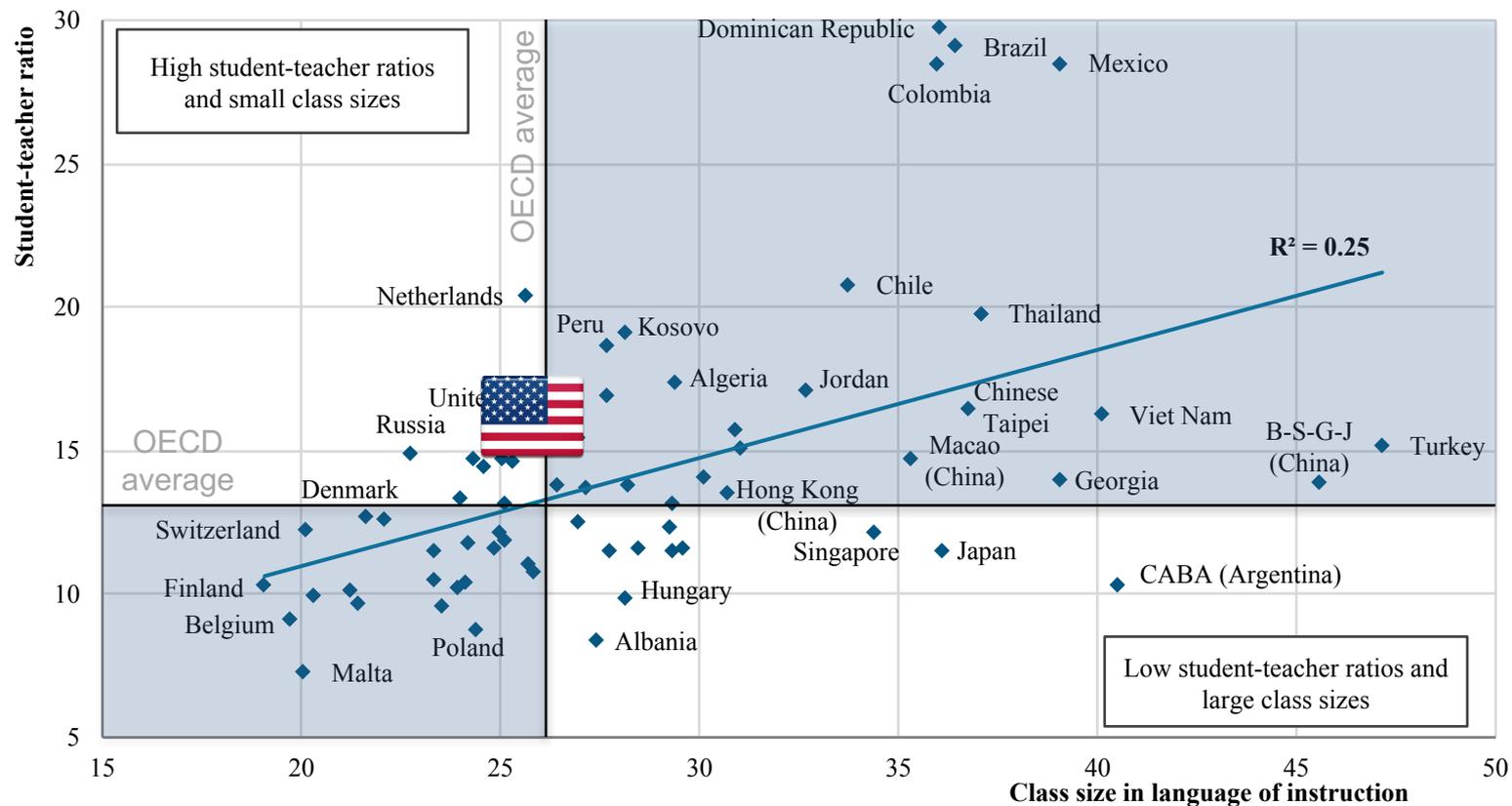
Concentration of immigrant students in schools



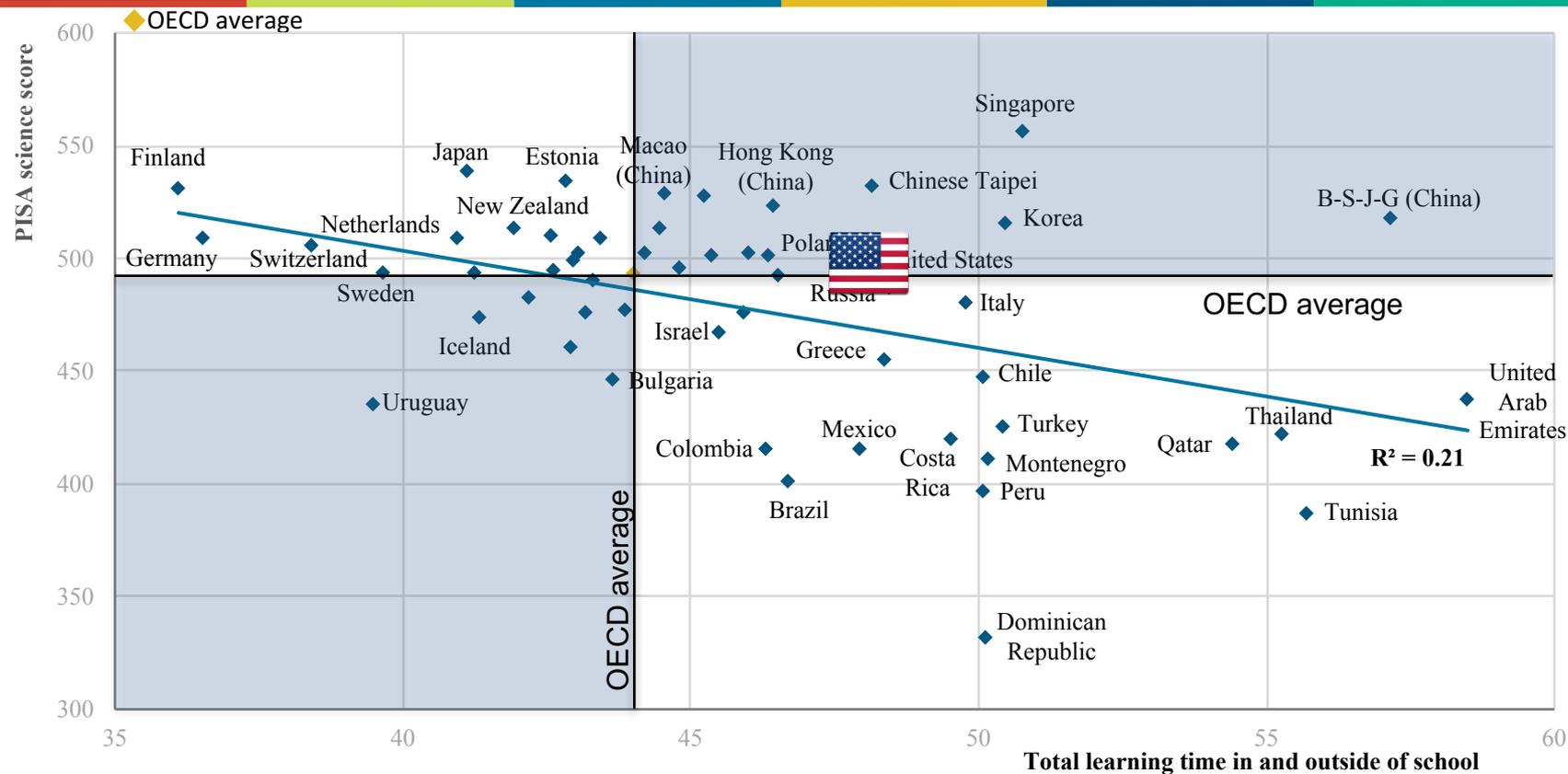
Quality time

Making learning time productive so that students can build their academic, social and emotional skills in a balanced way

Student-teacher ratios and class size



Learning time and science performance



Learning time and science performance

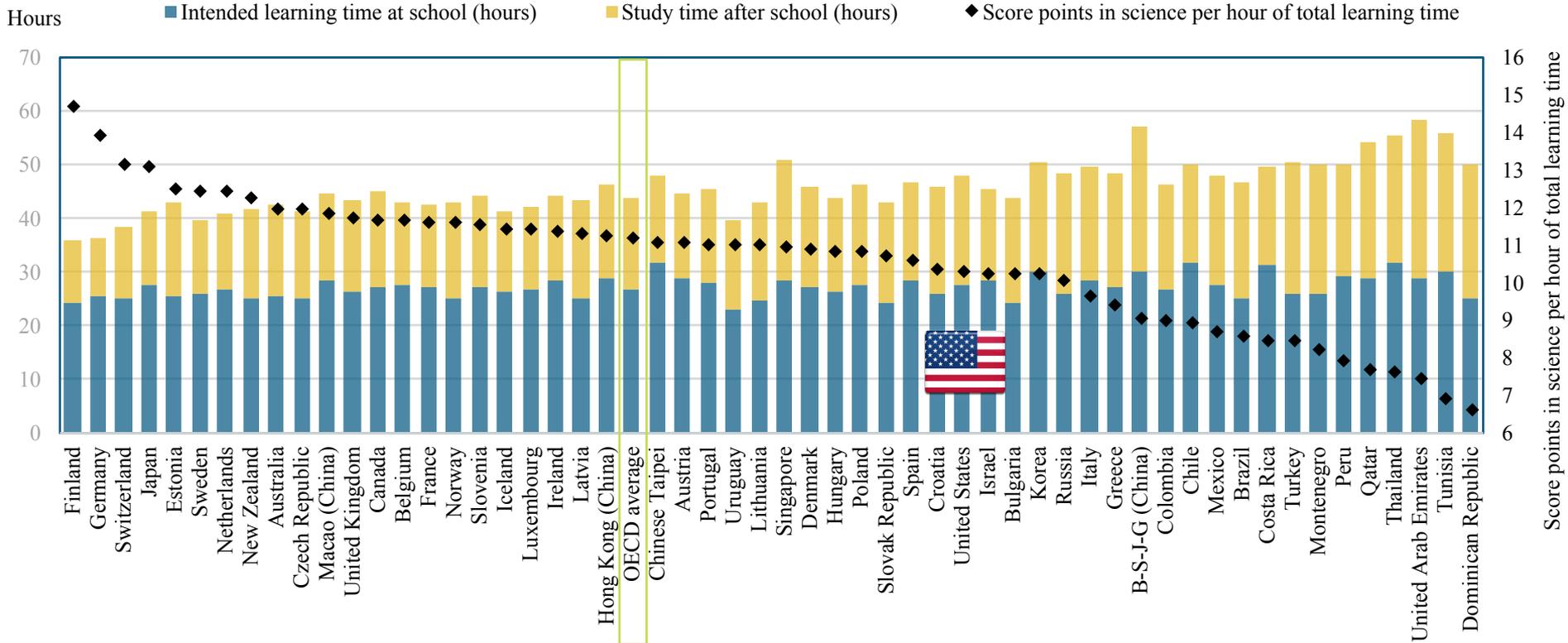
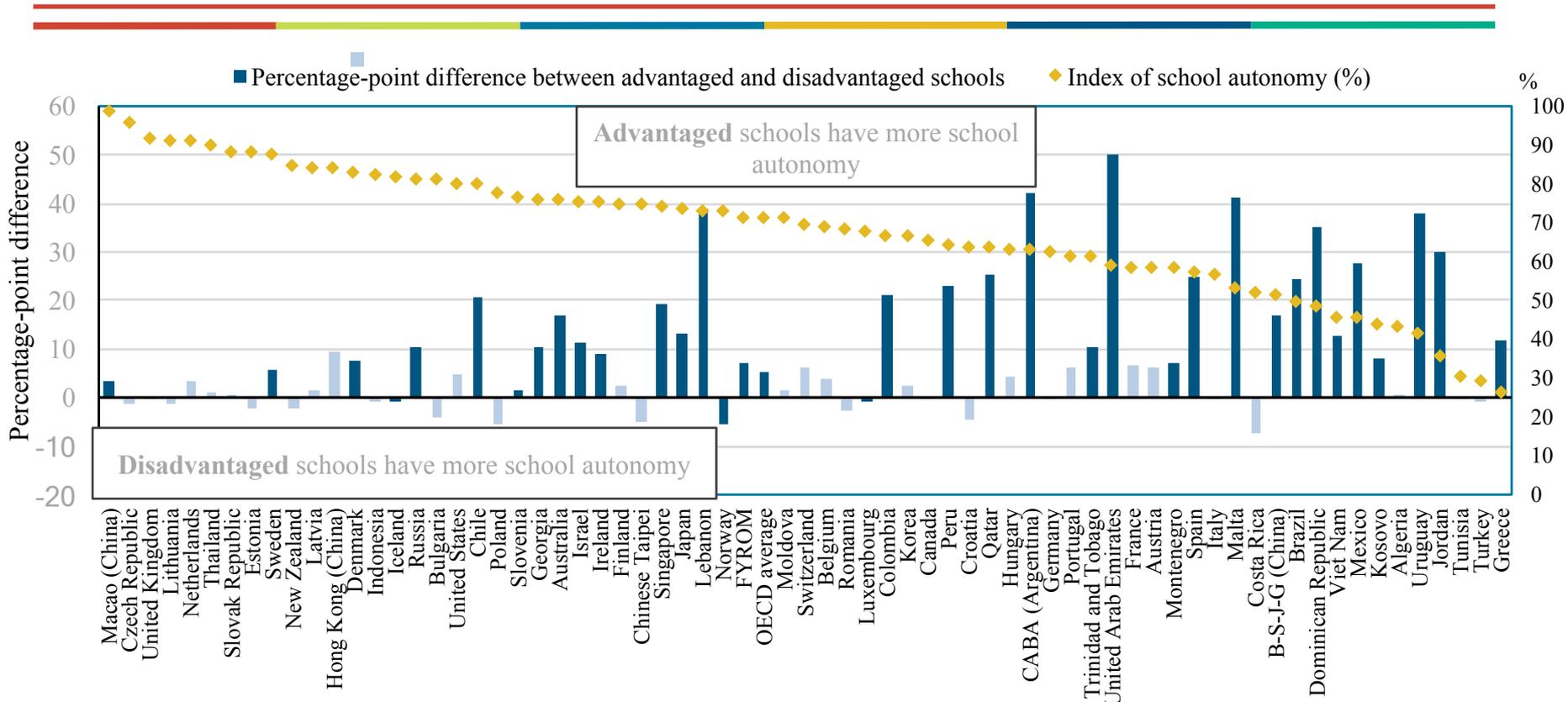


Figure II.4.7

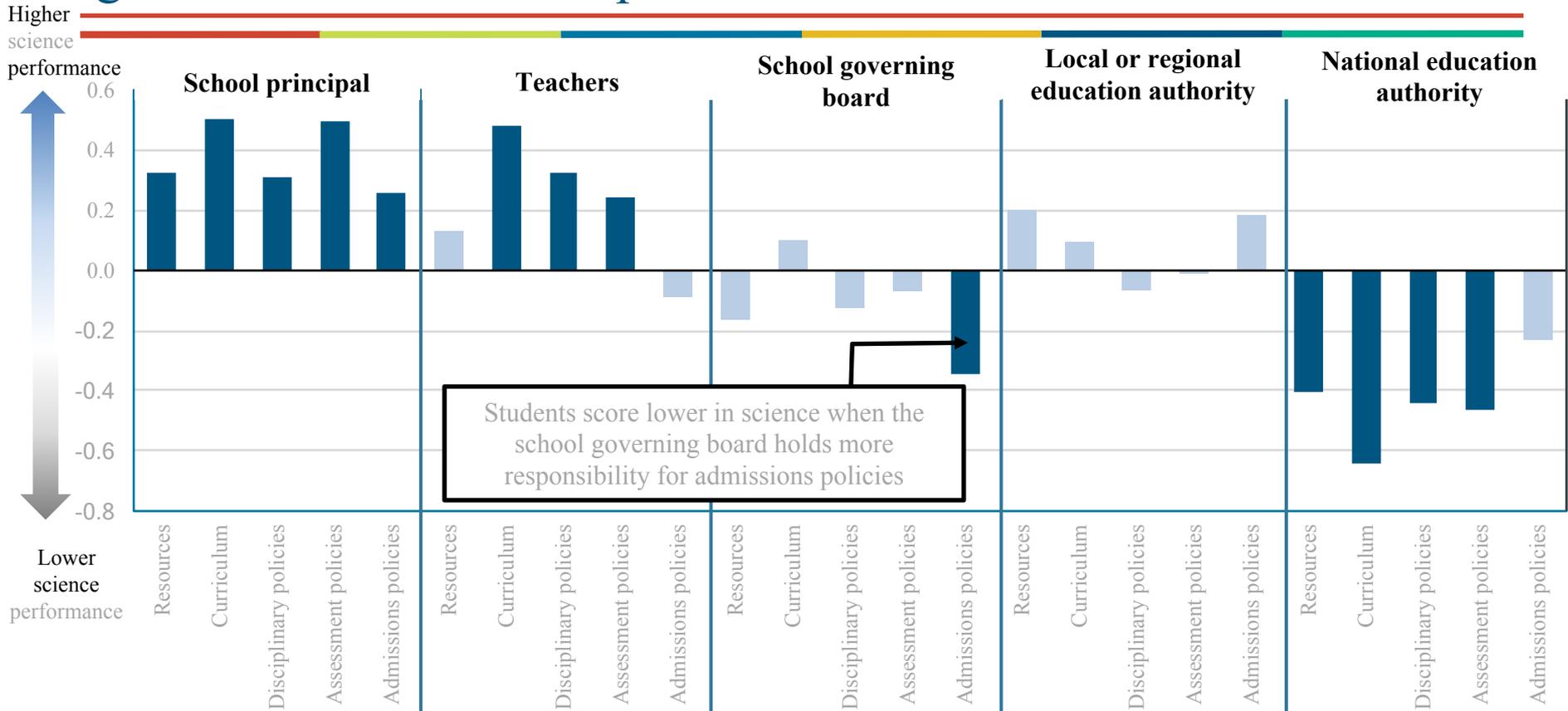
Index of school autonomy

by schools' socio-economic status



Correlations between the responsibilities for school governance and science performance

Figure II.4.8

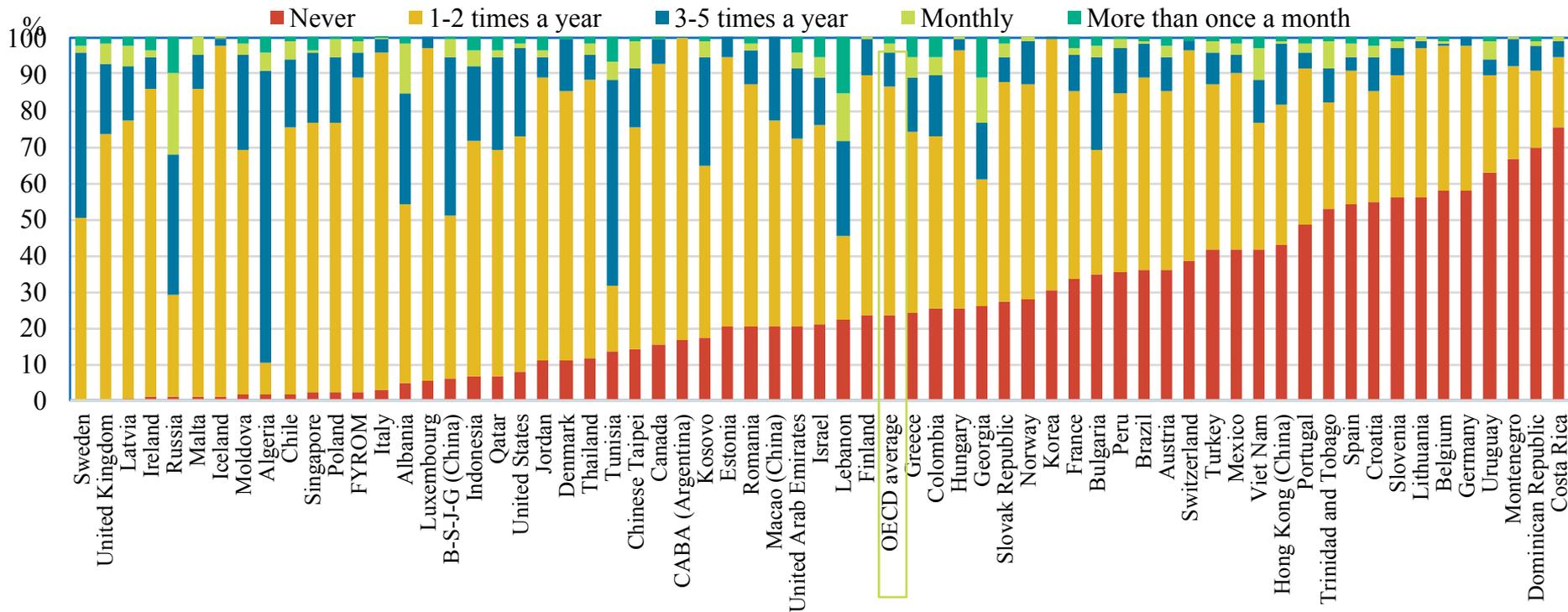


Student assessments and teacher appraisals are widely used

There are at least 19 education systems where there is a similar or higher percentage of 15-year-old students who attend schools where mandatory standardised tests are used at least once a year; and the percentage of students in the United States who are assessed with these tests more than once a month is similar to the OECD average

Frequency of mandatory standardised tests at school

Percentage of students in schools where mandatory standardised tests are used:

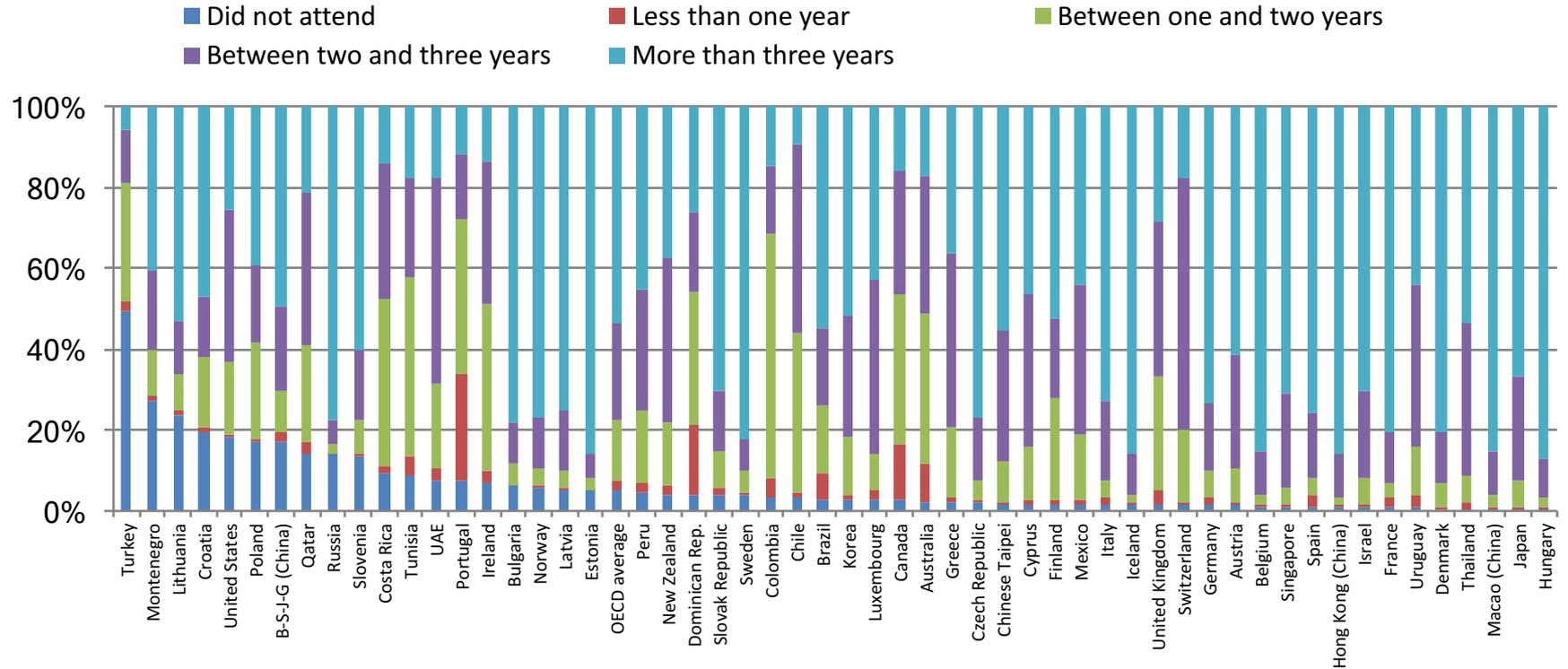


Starting strong



Attendance at pre-primary school

Percentage of students who attended pre-primary school ...



Attendance at pre-primary school

by schools' socio-economic profile

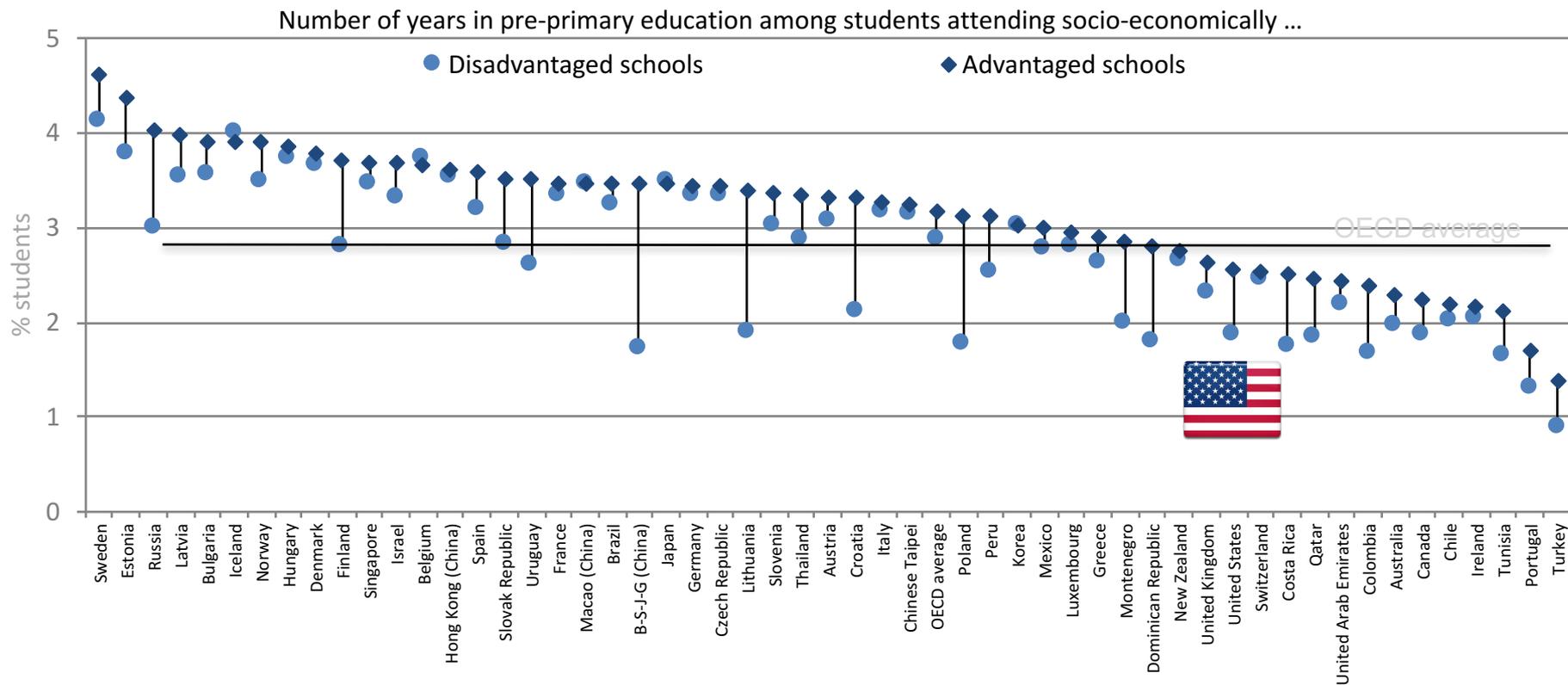
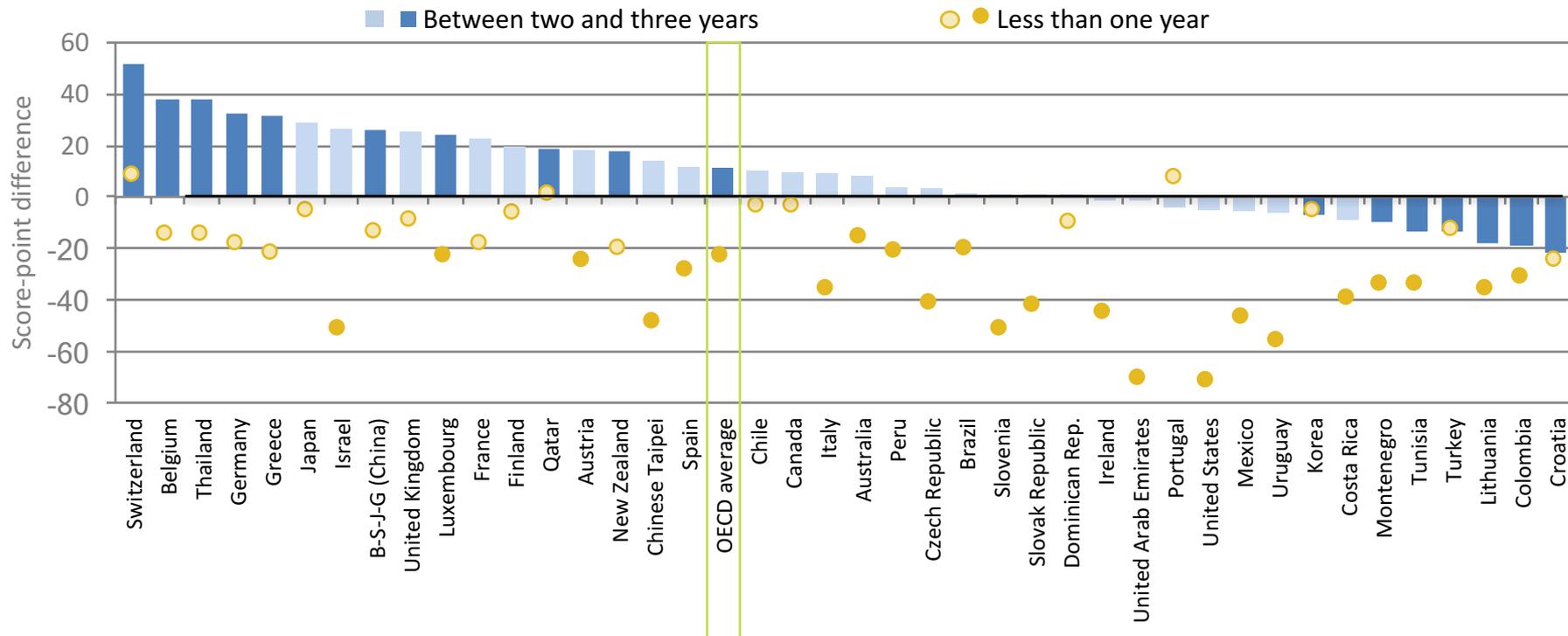


Table II.6.52

Attendance at pre-primary school and science performance

Compared to students who did not attend pre-primary school, score-point difference in science when students attended ...



Thank you

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