



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...

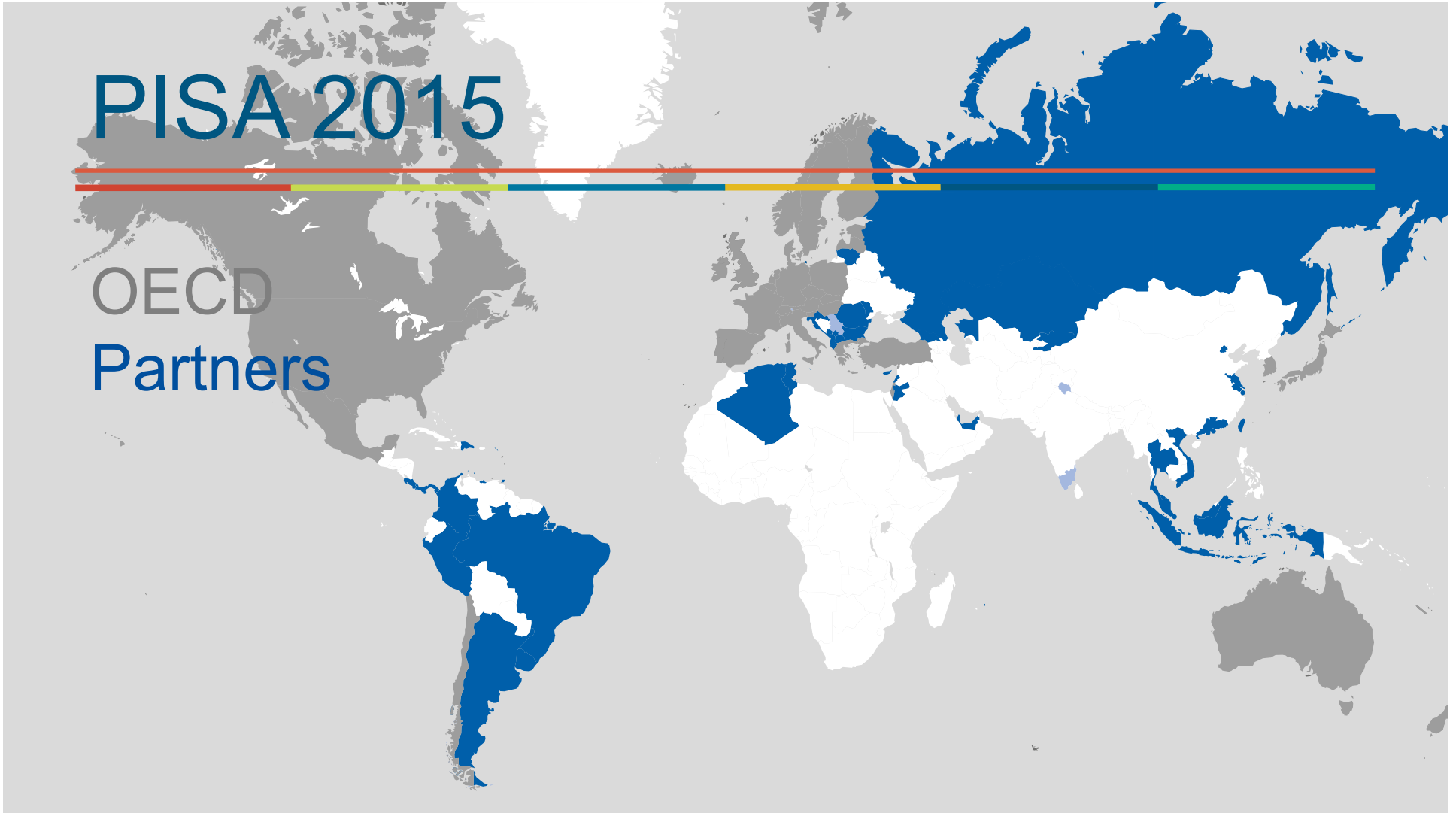
- their personal background, their schools, their well-being and their motivation

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

OECD
Partners

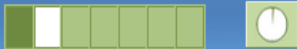




Science in PISA

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





Sustainable Fish Farming

Question 1 / 4

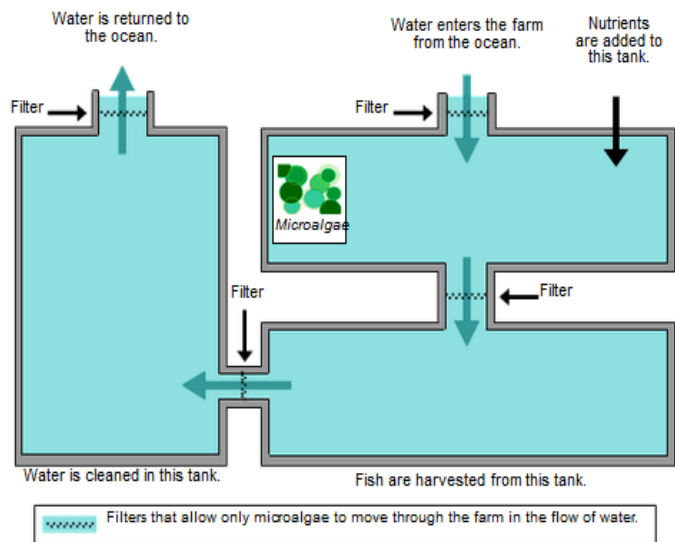
Refer to the information below. Use drag and drop to answer the question.

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

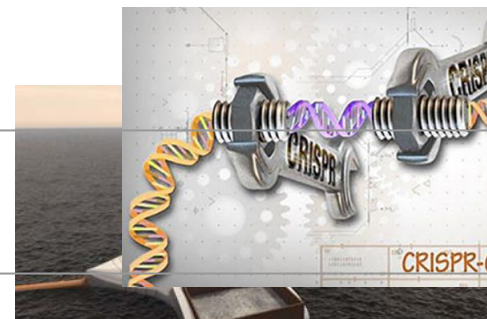
This question requires students to understand a system and the role of several organisms within that system. In order to answer correctly, students must understand the goal of the fish farm, the function of each of the three tanks therein, and which organisms will best fulfill each function. Students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

Student performance

OECD average



470
450

2006



2009



2012



2015



Trends in science performance

570

550

530

510

490

450

OECD average

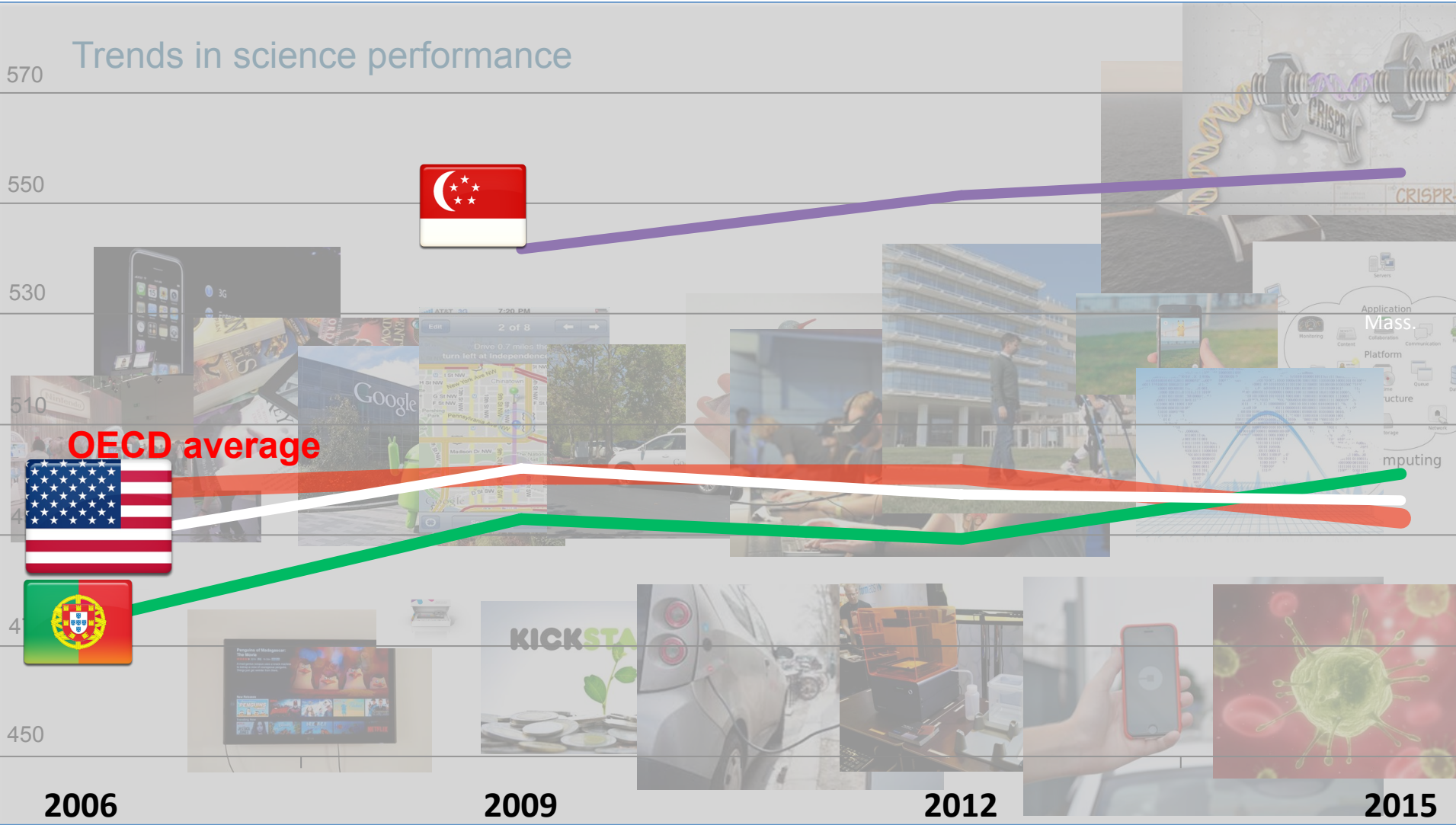


2006

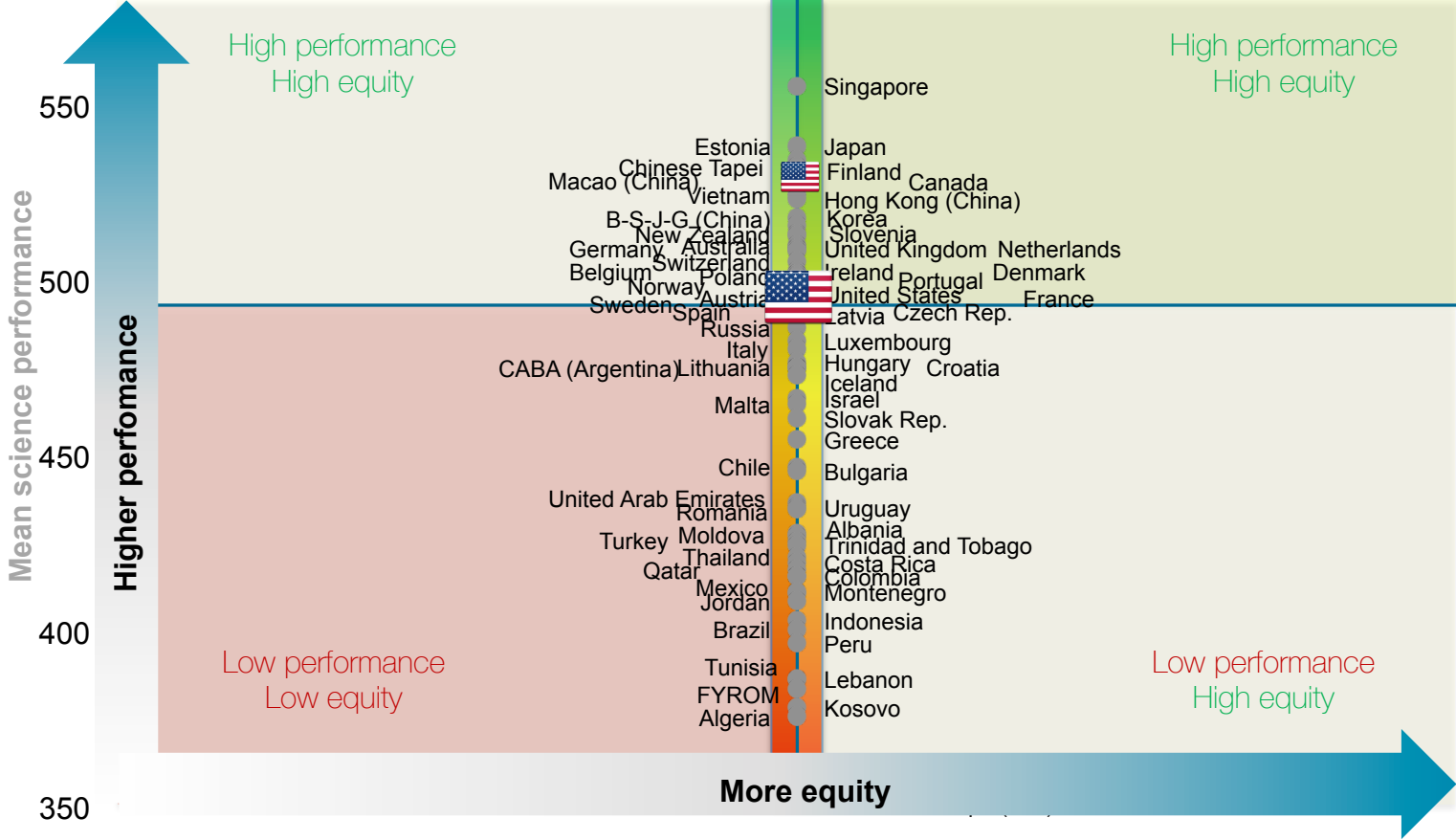
2009

2012

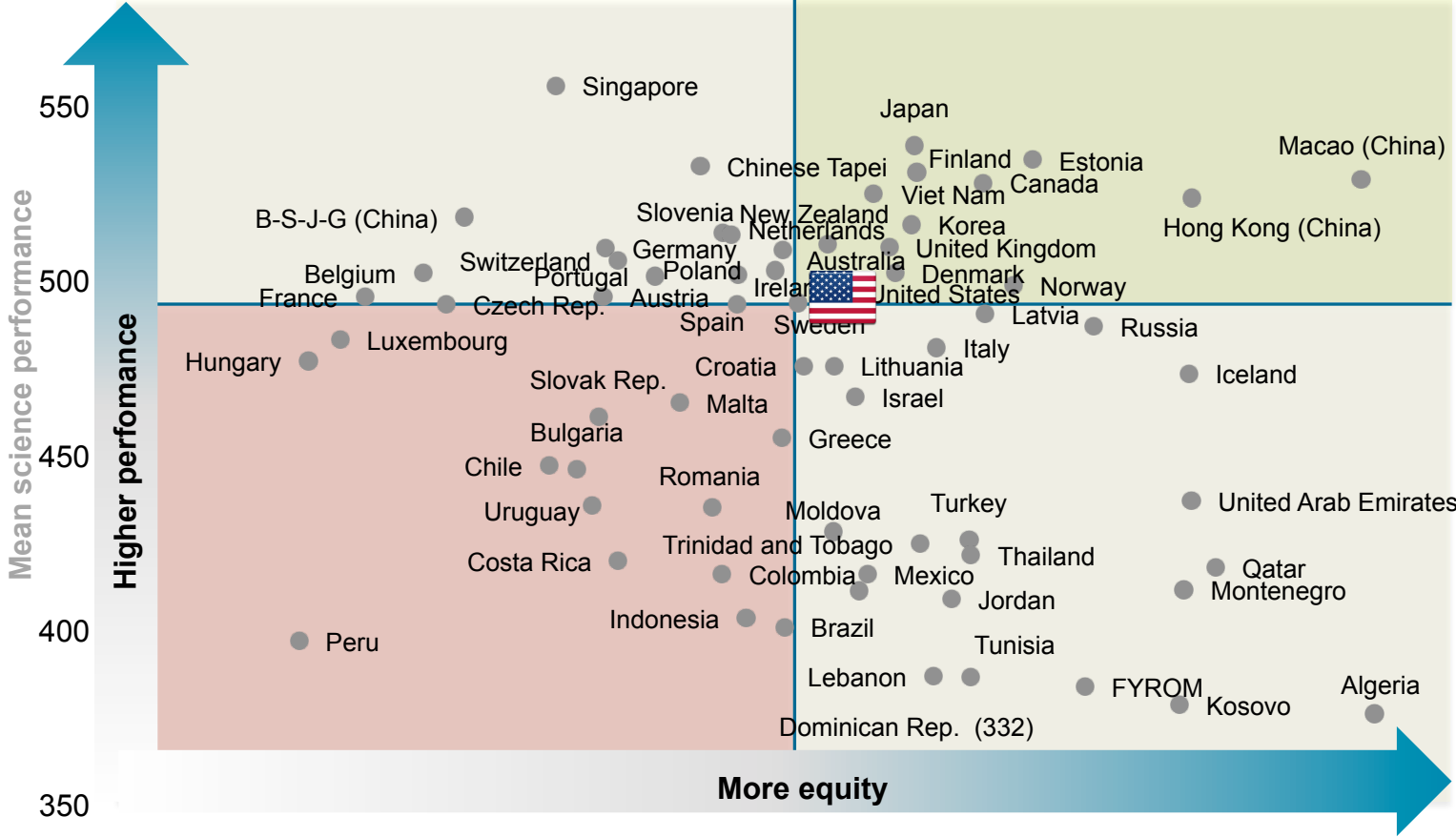
2015



Science performance in PISA (2015)

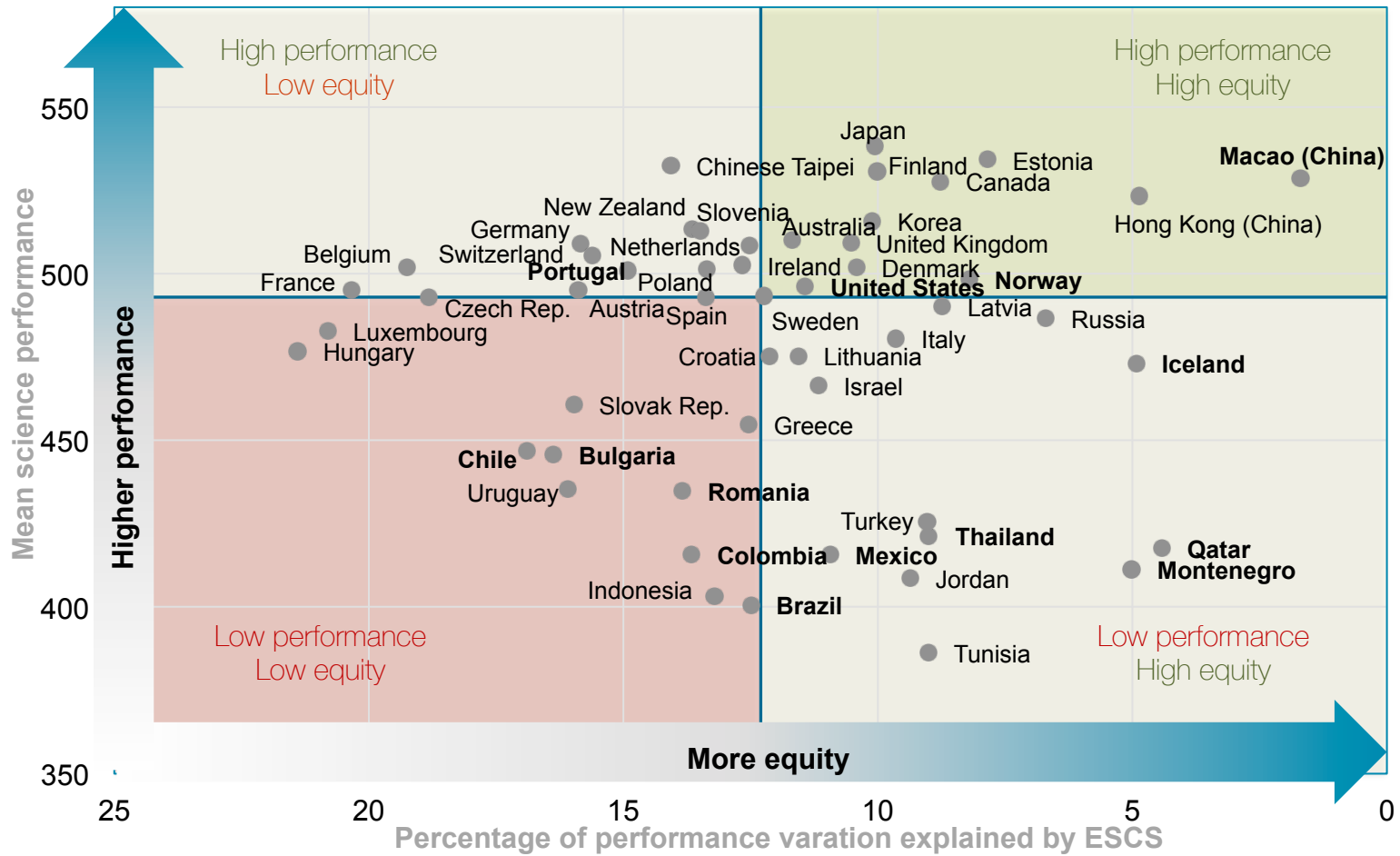


Science performance and equity in PISA (2015)



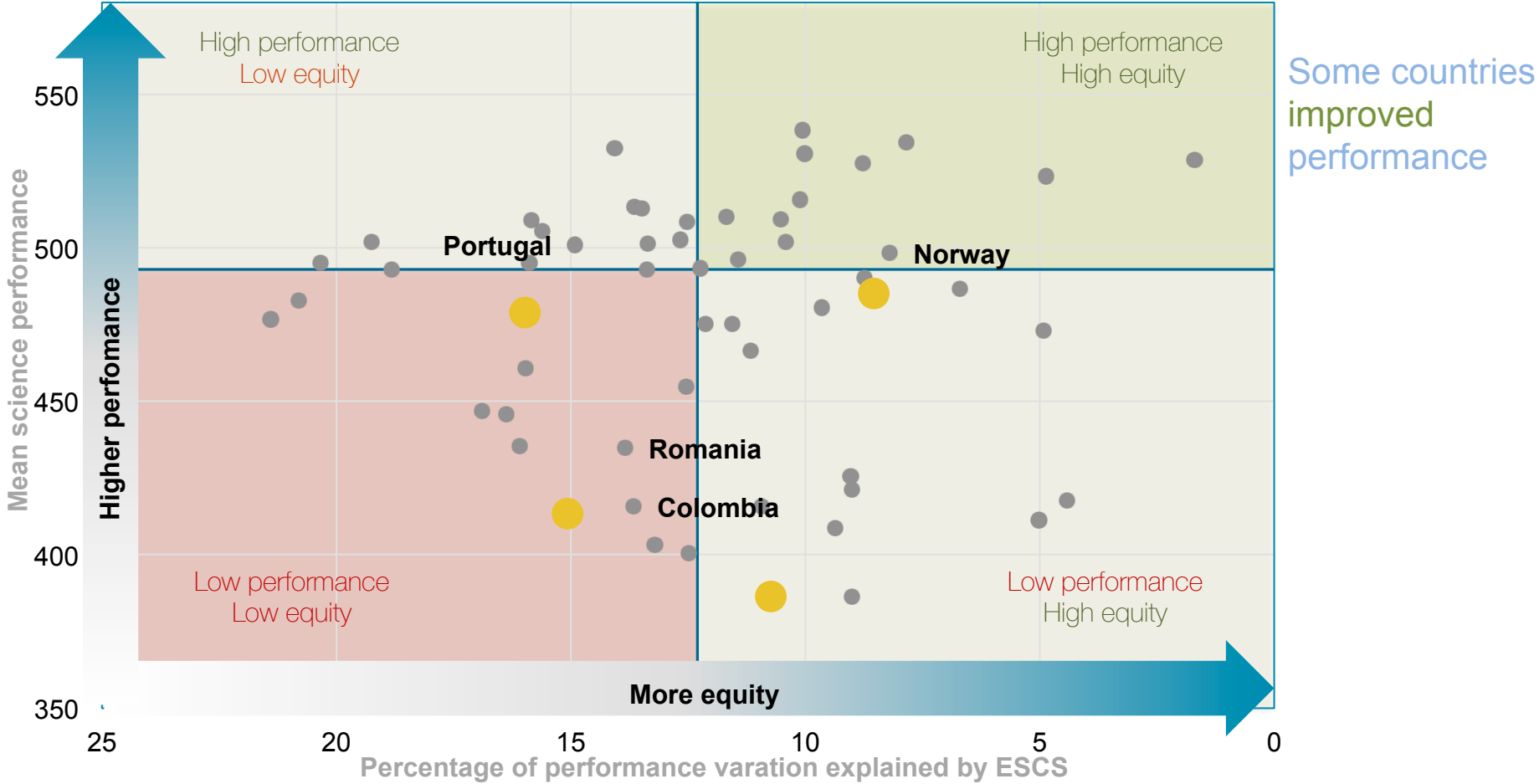
Some countries combine excellence with equity

Science performance and equity in PISA (2006-2015)

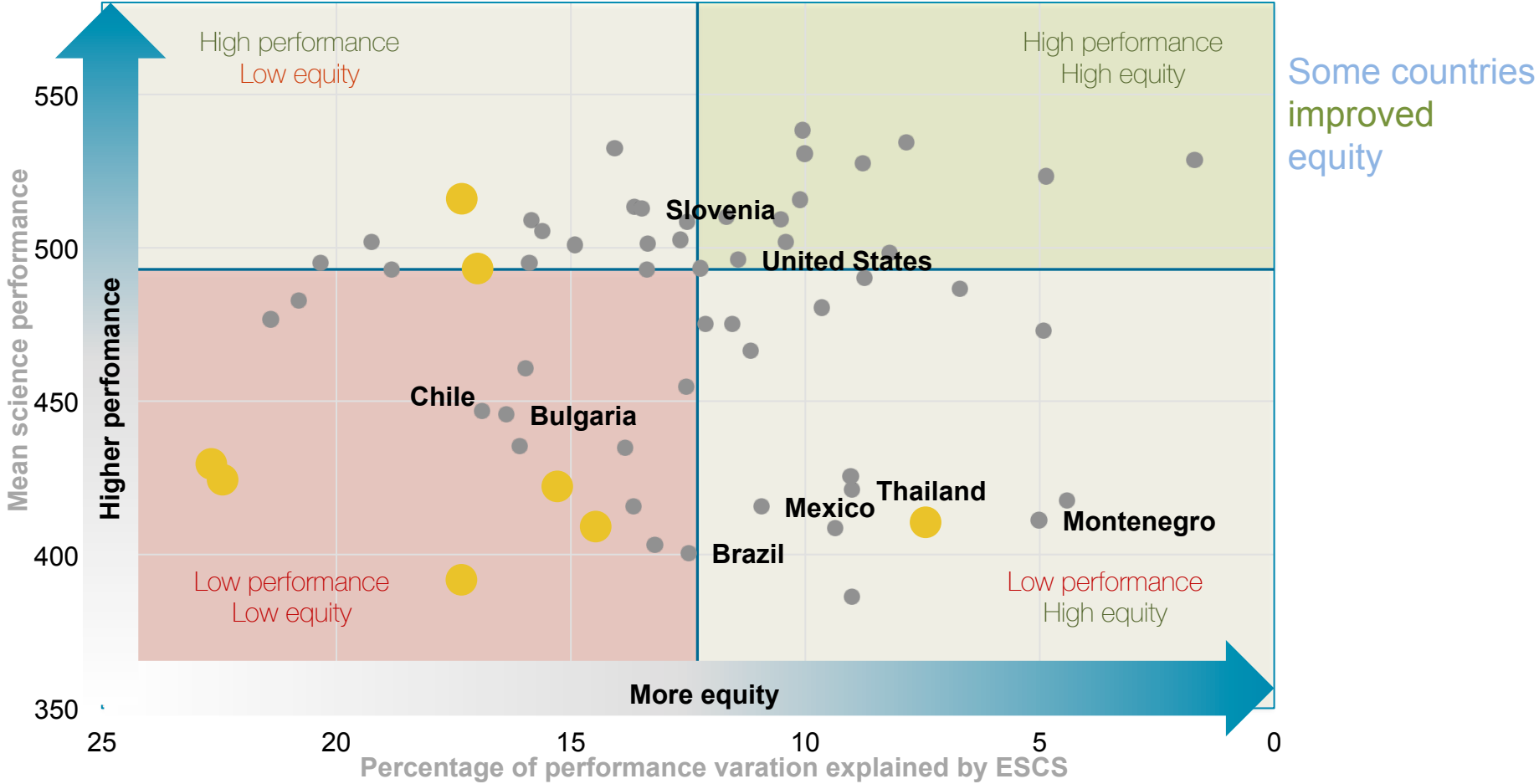


Some countries improved performance or equity

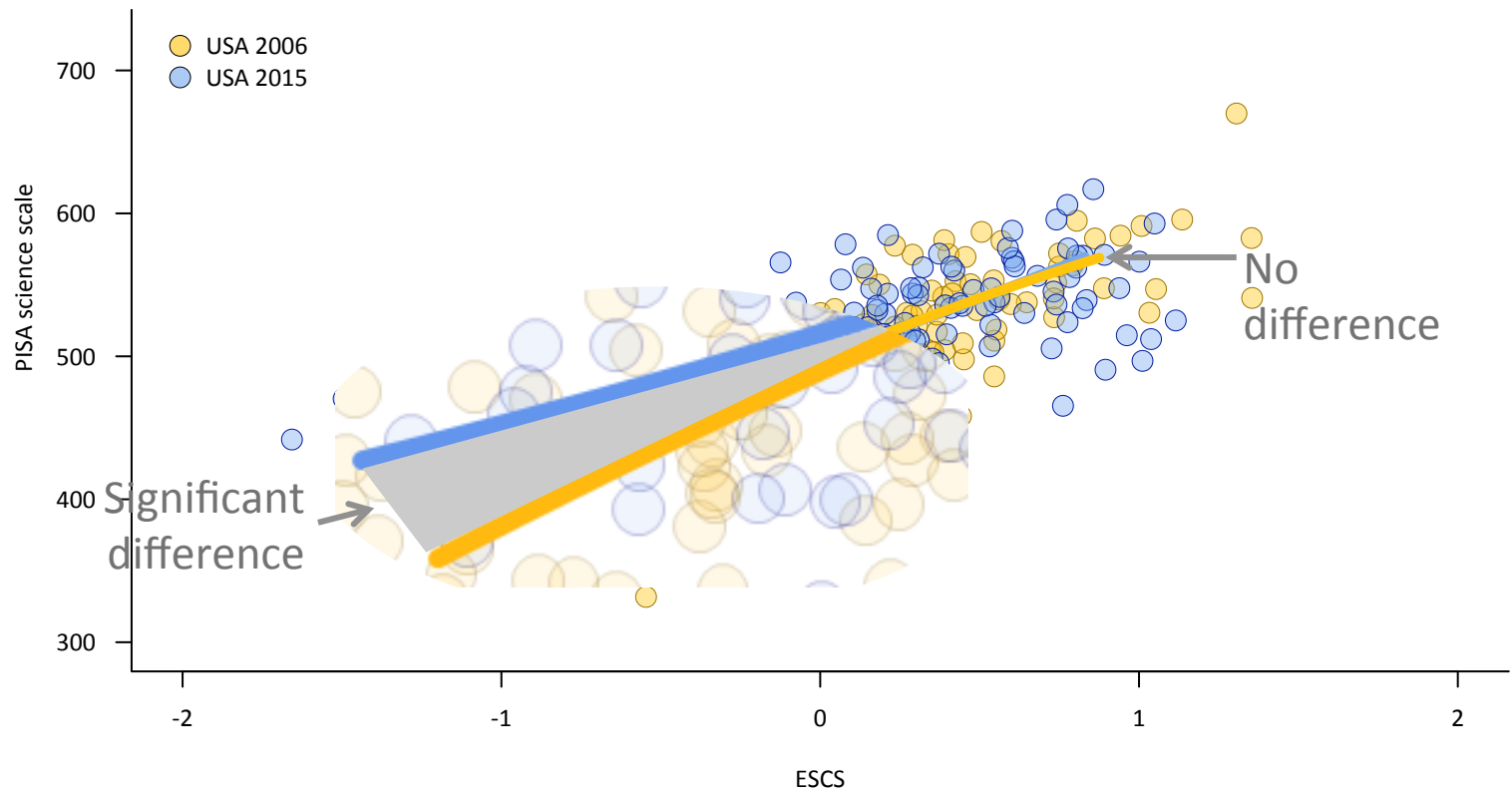
Science performance and equity in PISA (2006-2015)



Science performance and equity in PISA (2006-2015)



Greater equity



Poverty is not destiny - Science performance

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

Figure I.6.7

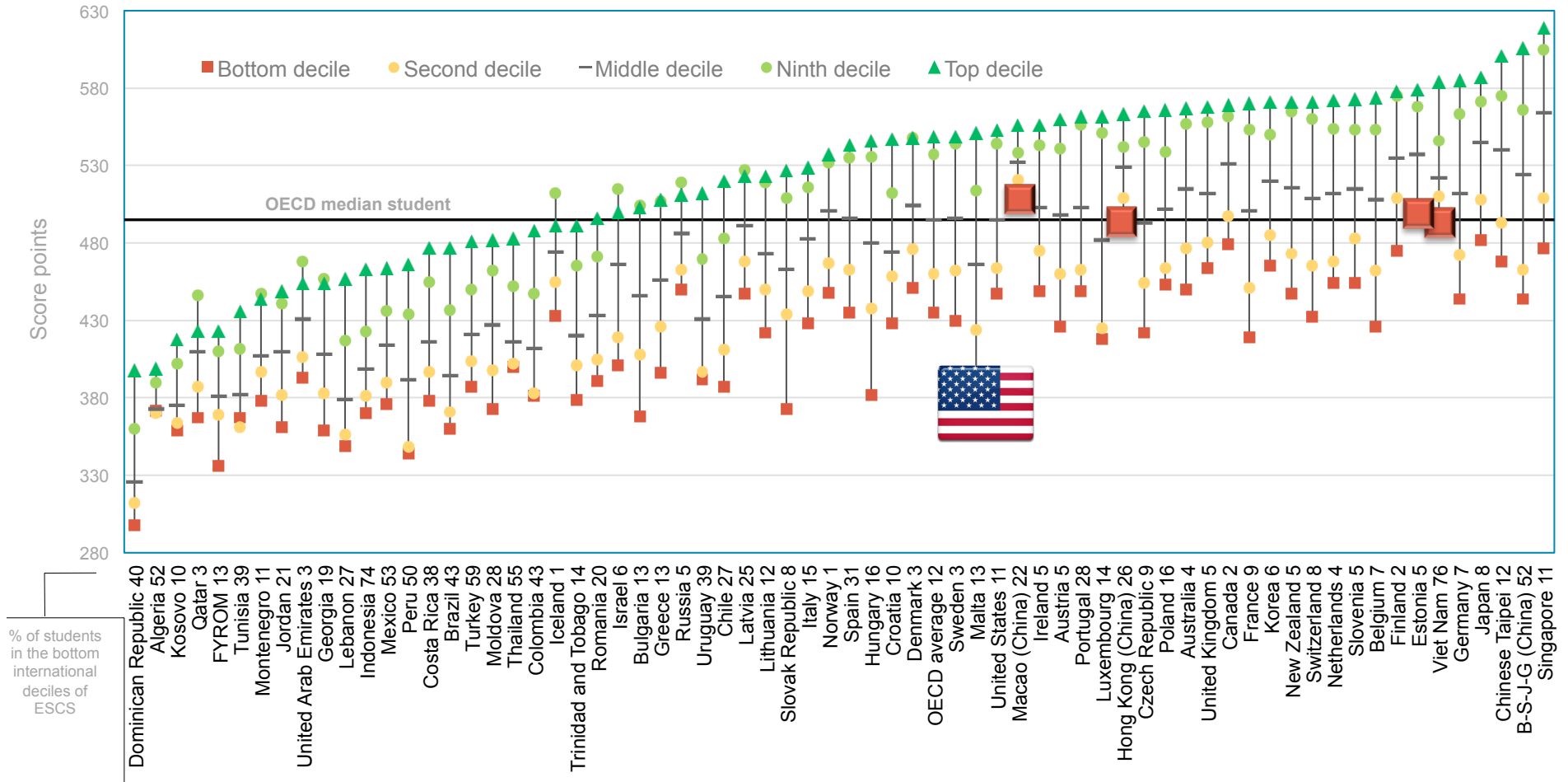
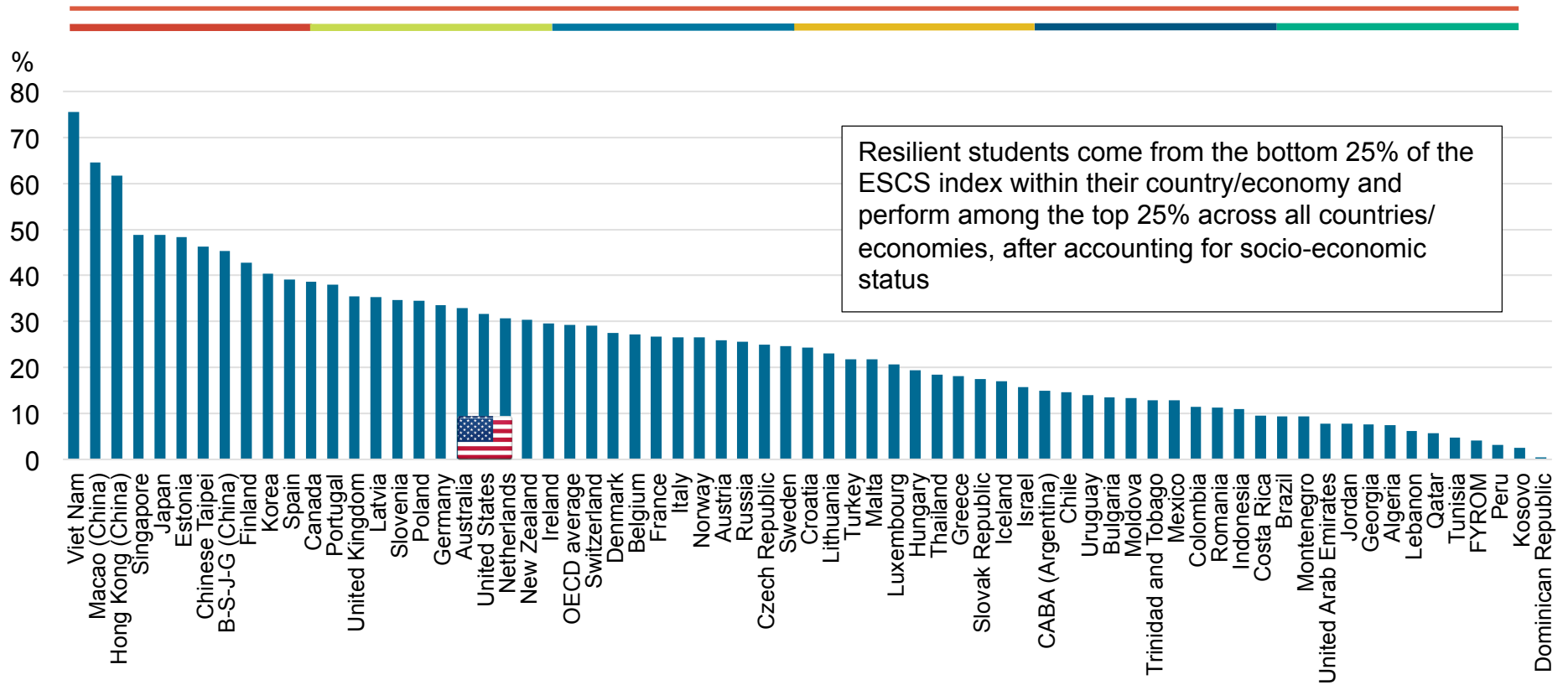


Figure I.6.10

Percentage of resilient students

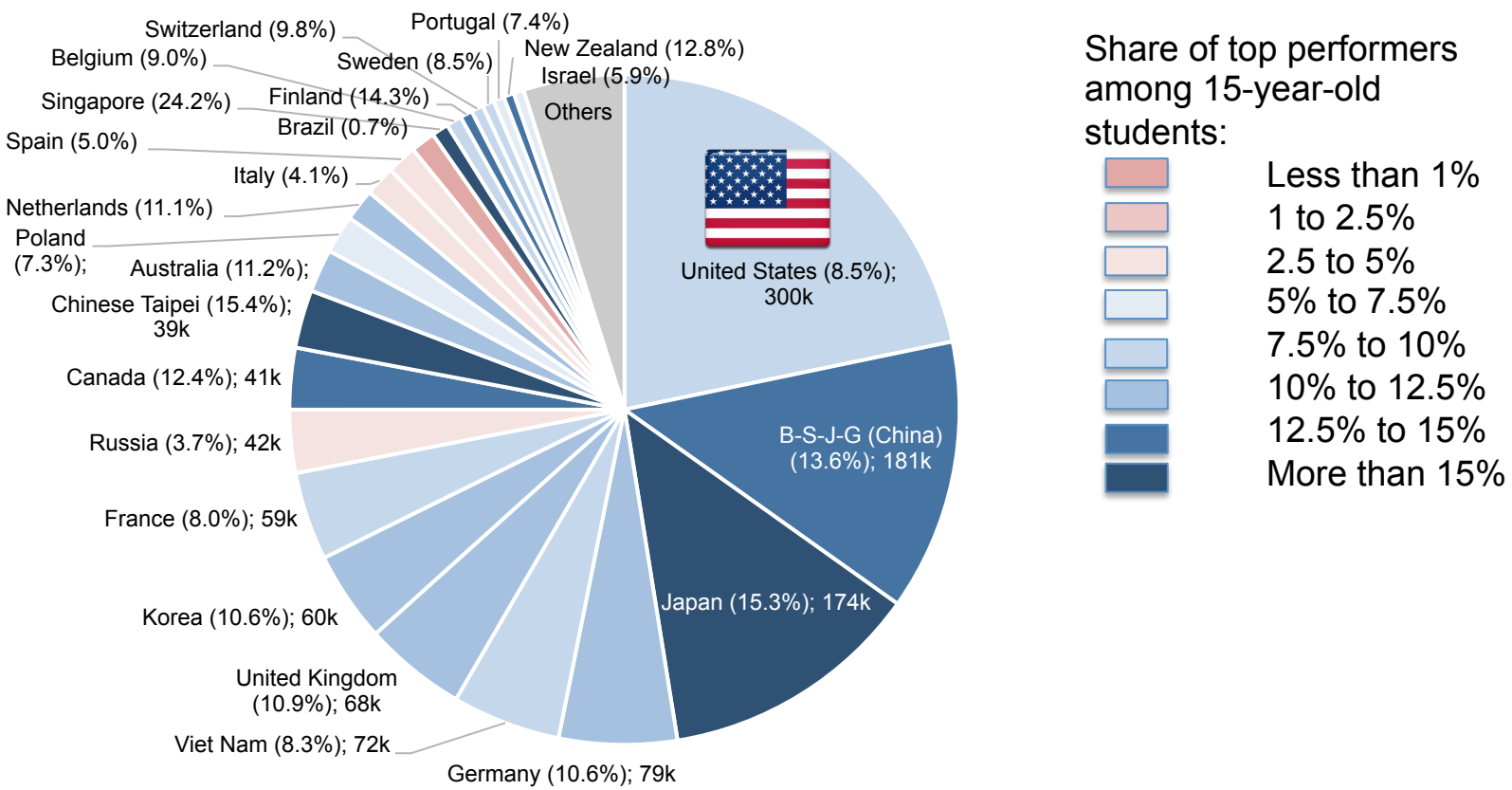


Excellence and baseline performance



Figure I.2.18

The global pool of top performers: A PISA perspective



Science and careers



Figure I.3.5

Expectations of a science career by gender

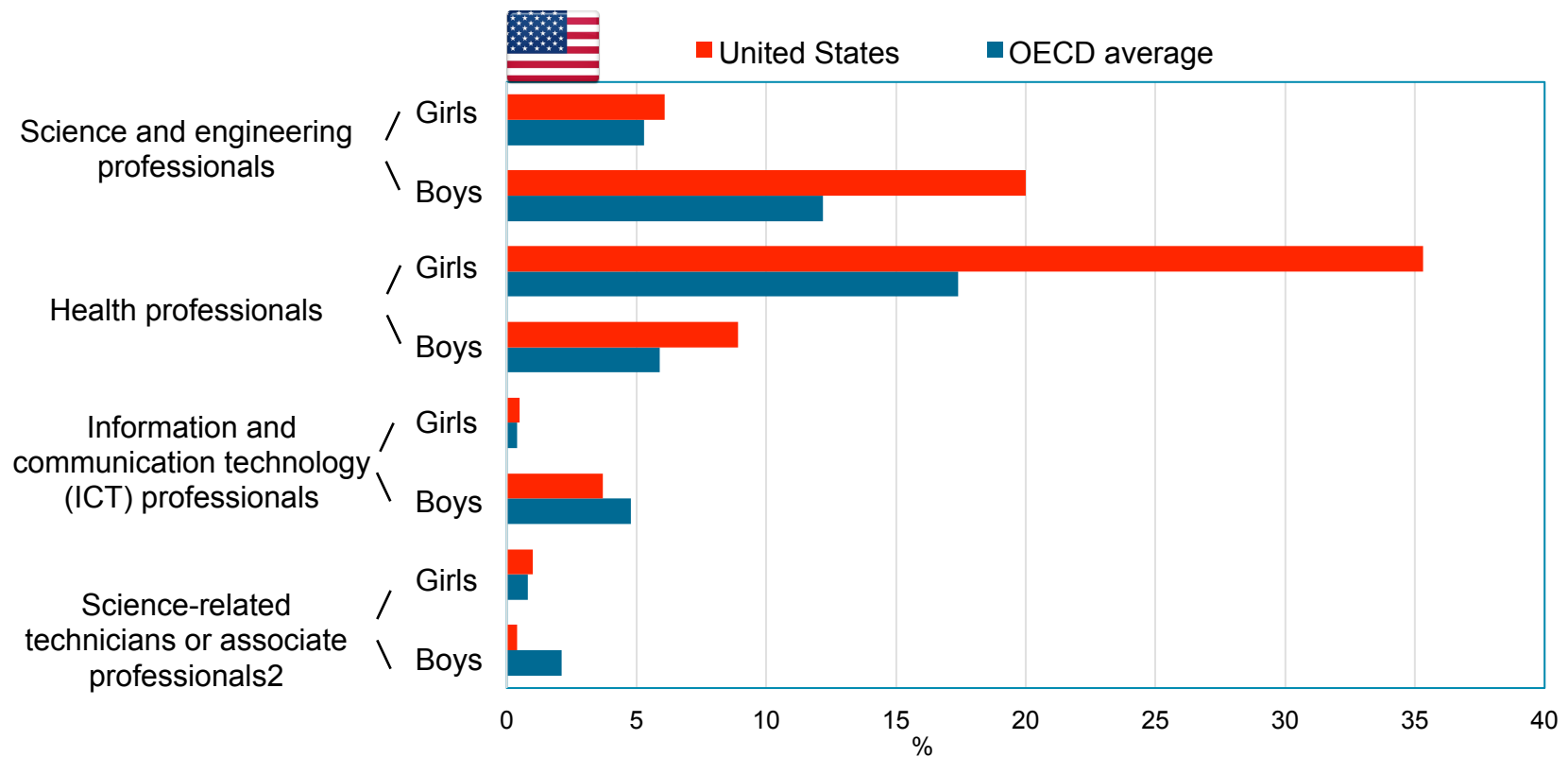


Figure I.3.2

Students expecting a career in science

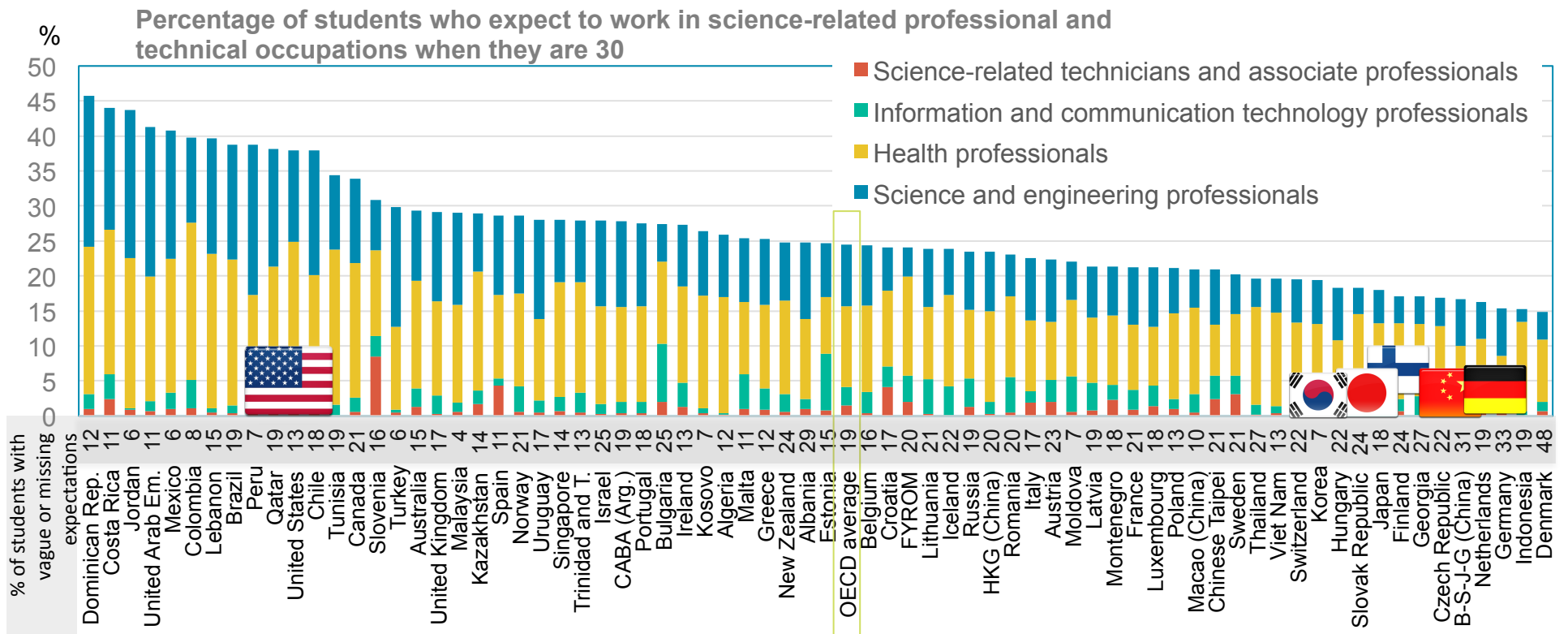


Figure I.3.17

Students expecting a career in science

by performance and enjoyment of learning

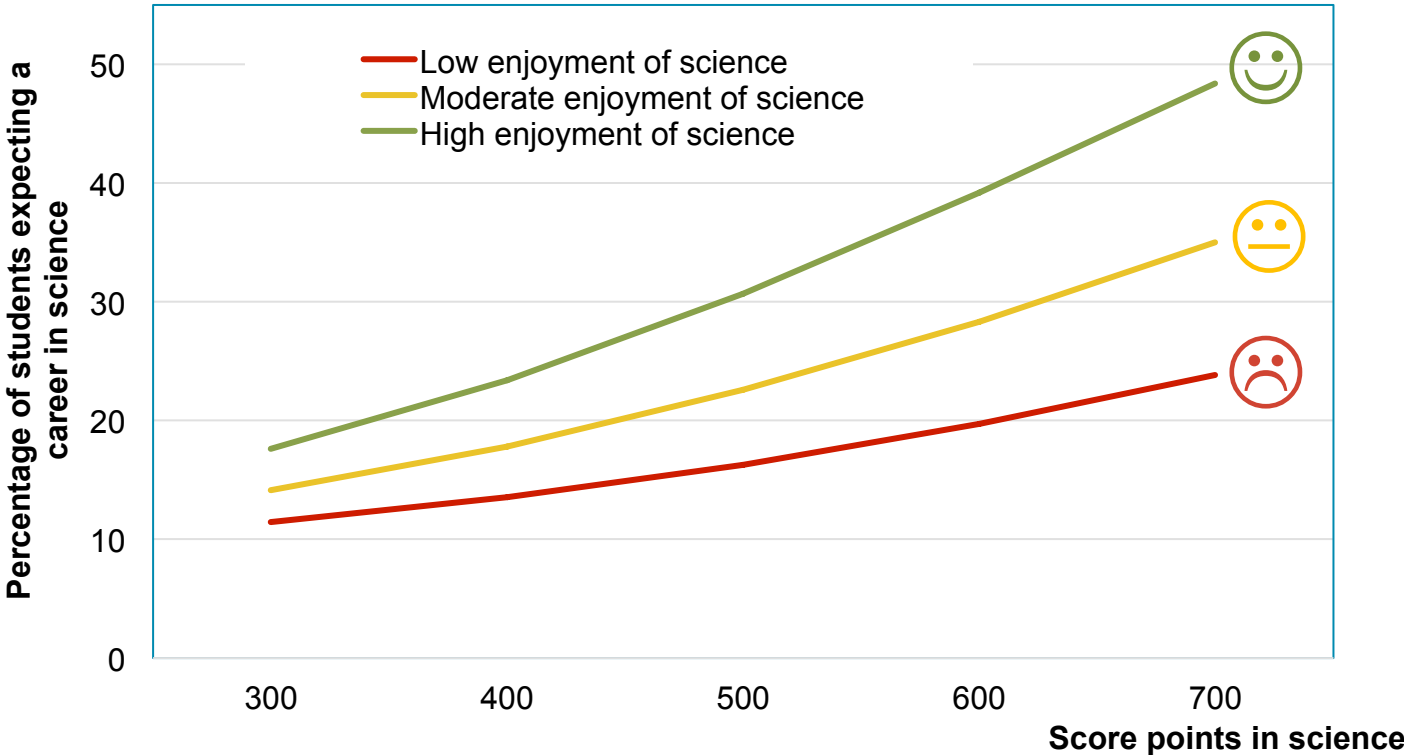
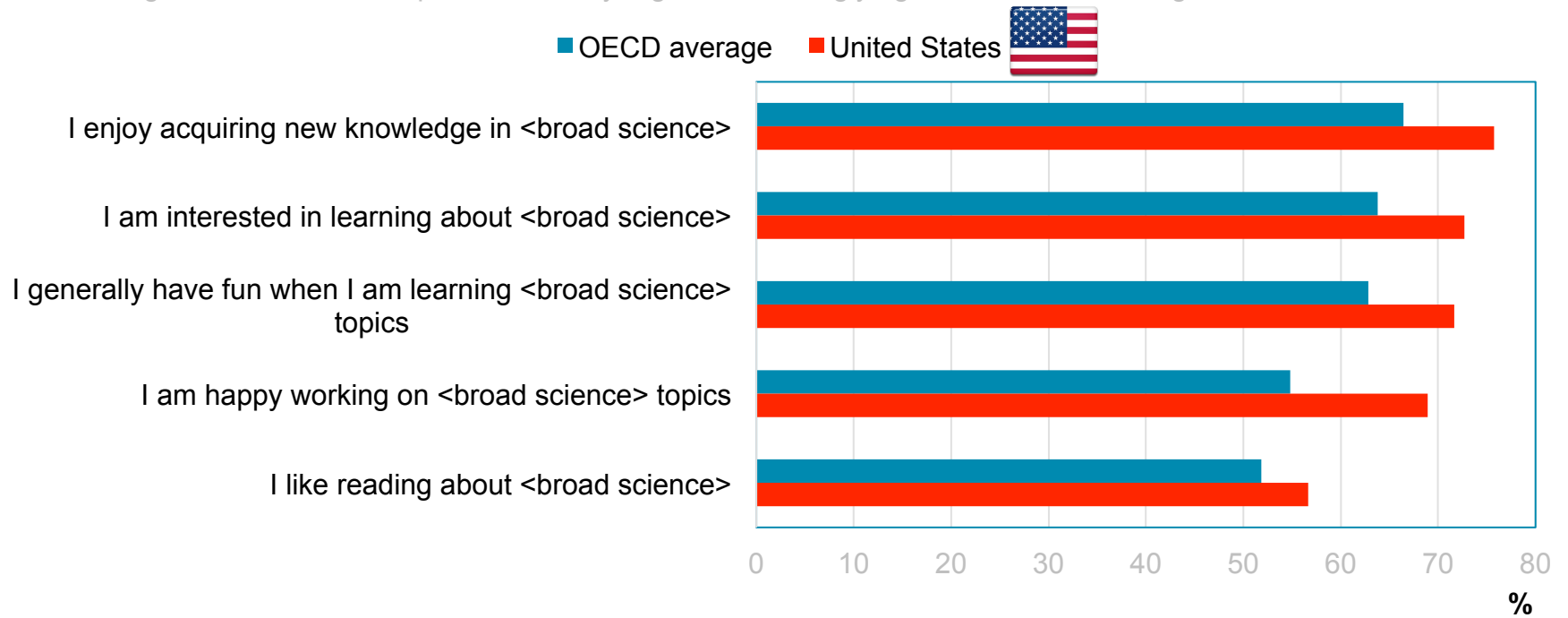


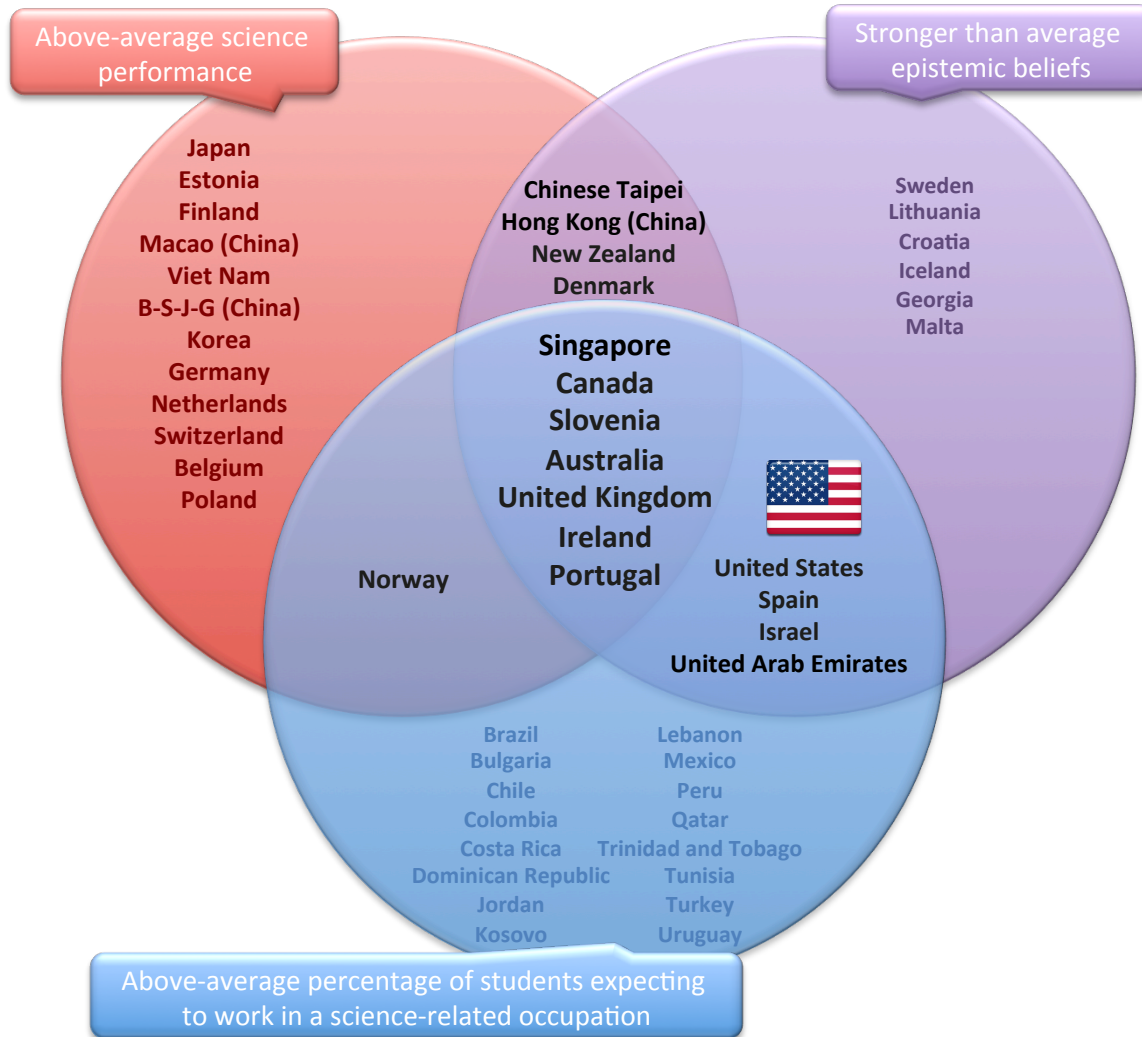
Figure I.3.9

Students' enjoyment of learning science

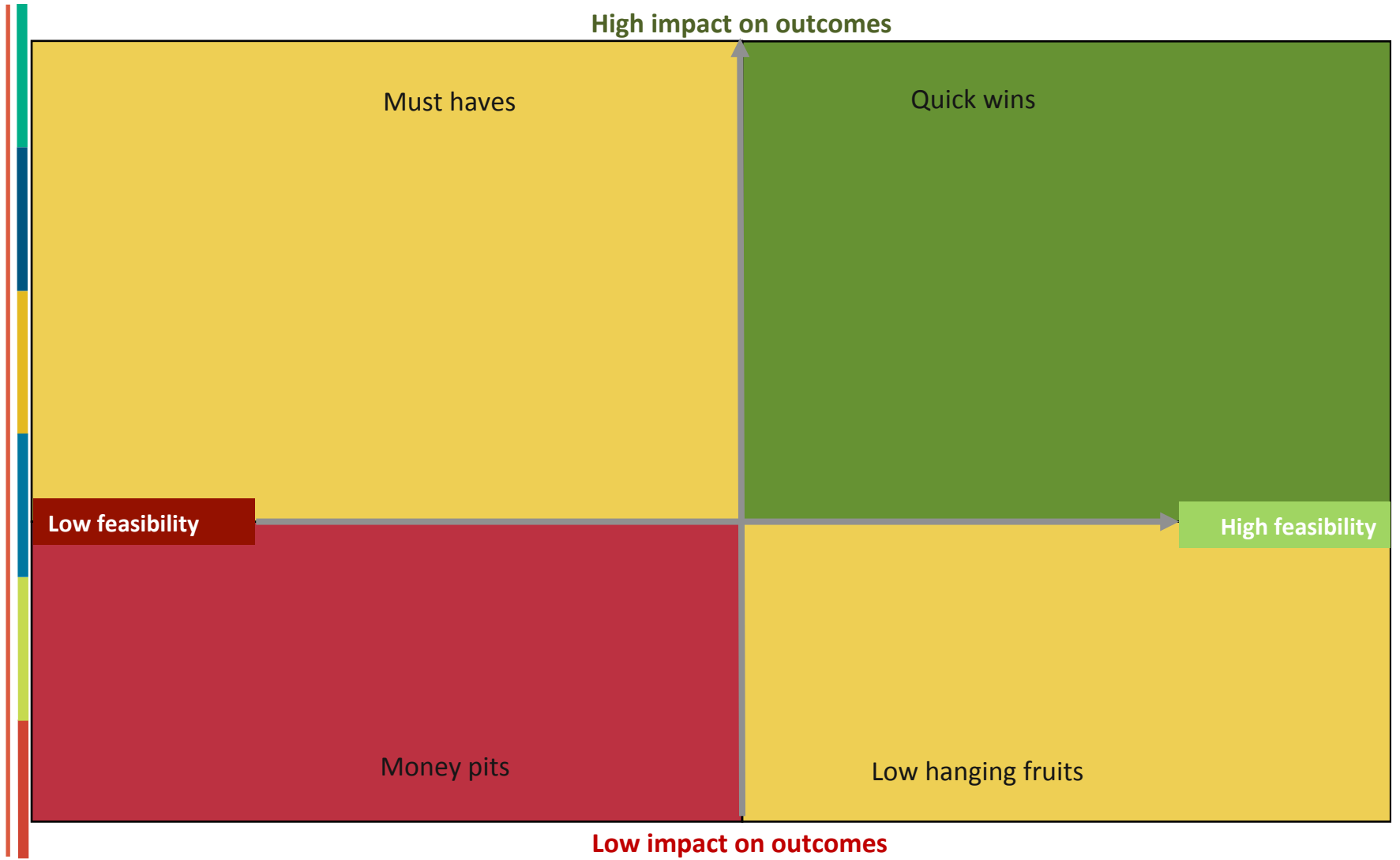
Percentage of students who reported that they "agree" or "strongly agree" with the following statements



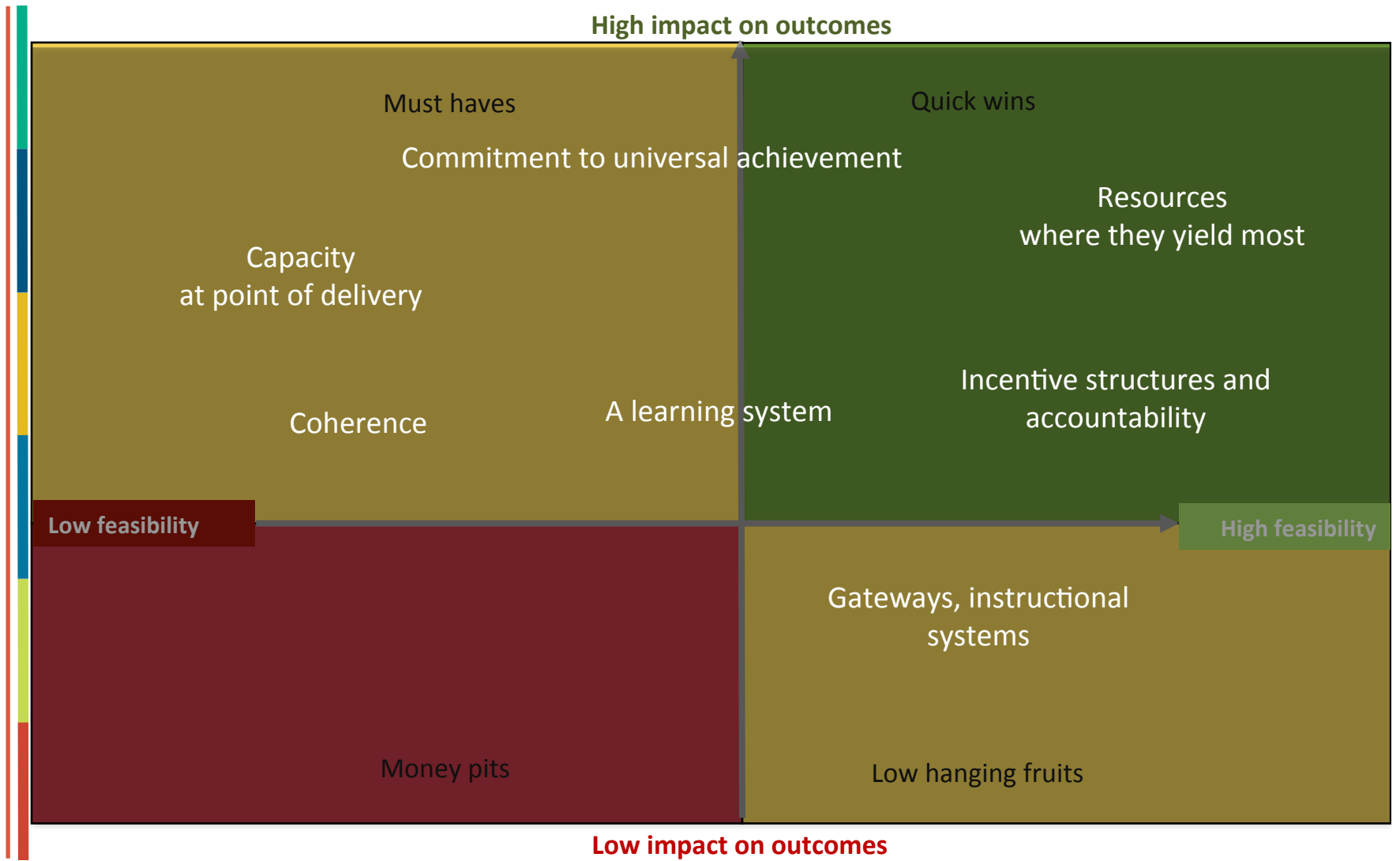
Multiple outcomes



Lessons from PISA



Lessons from PISA



Lessons from PISA

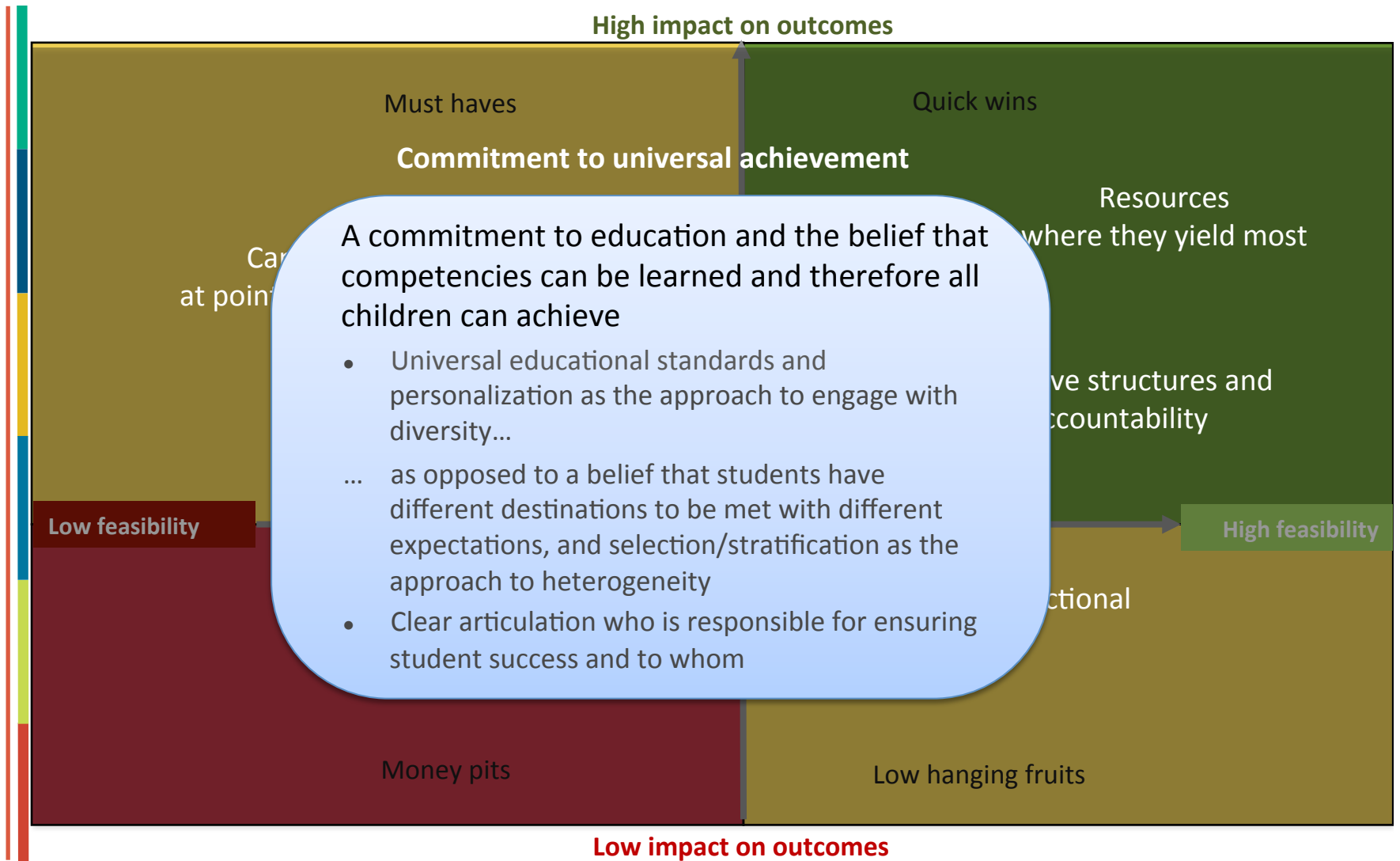
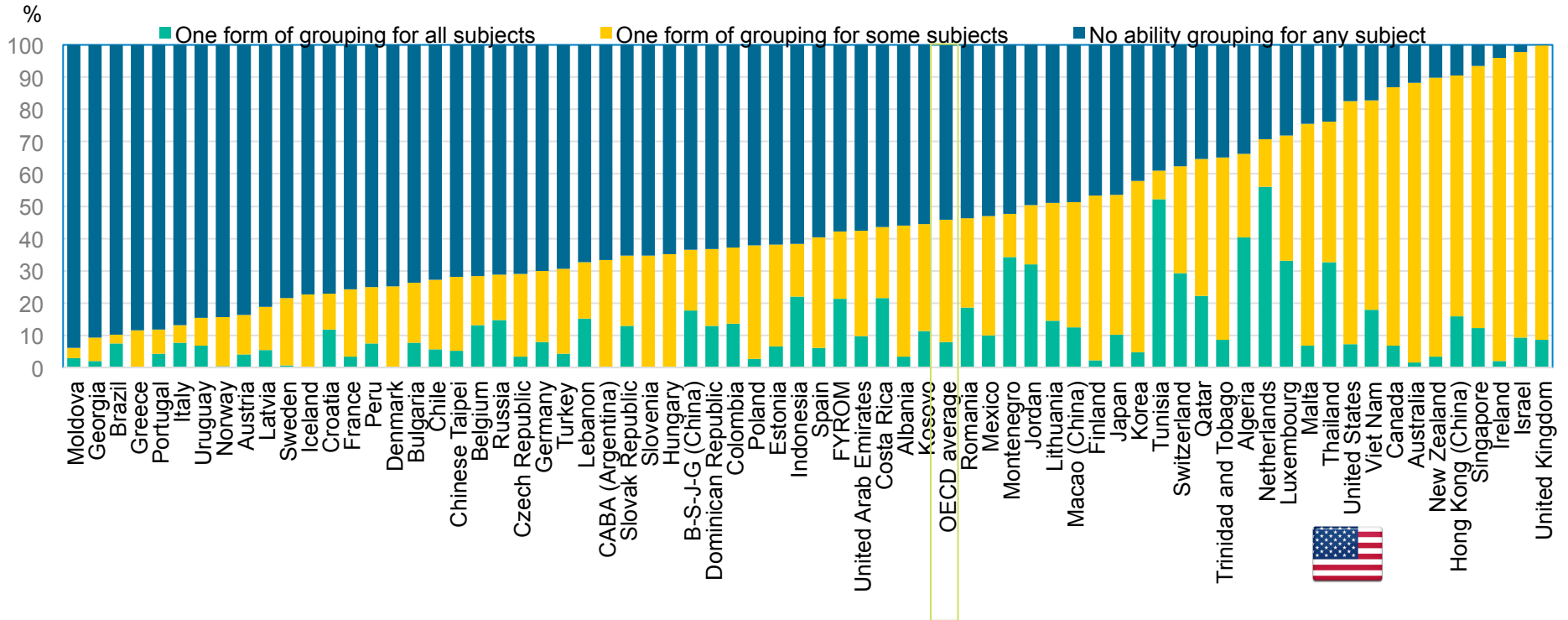


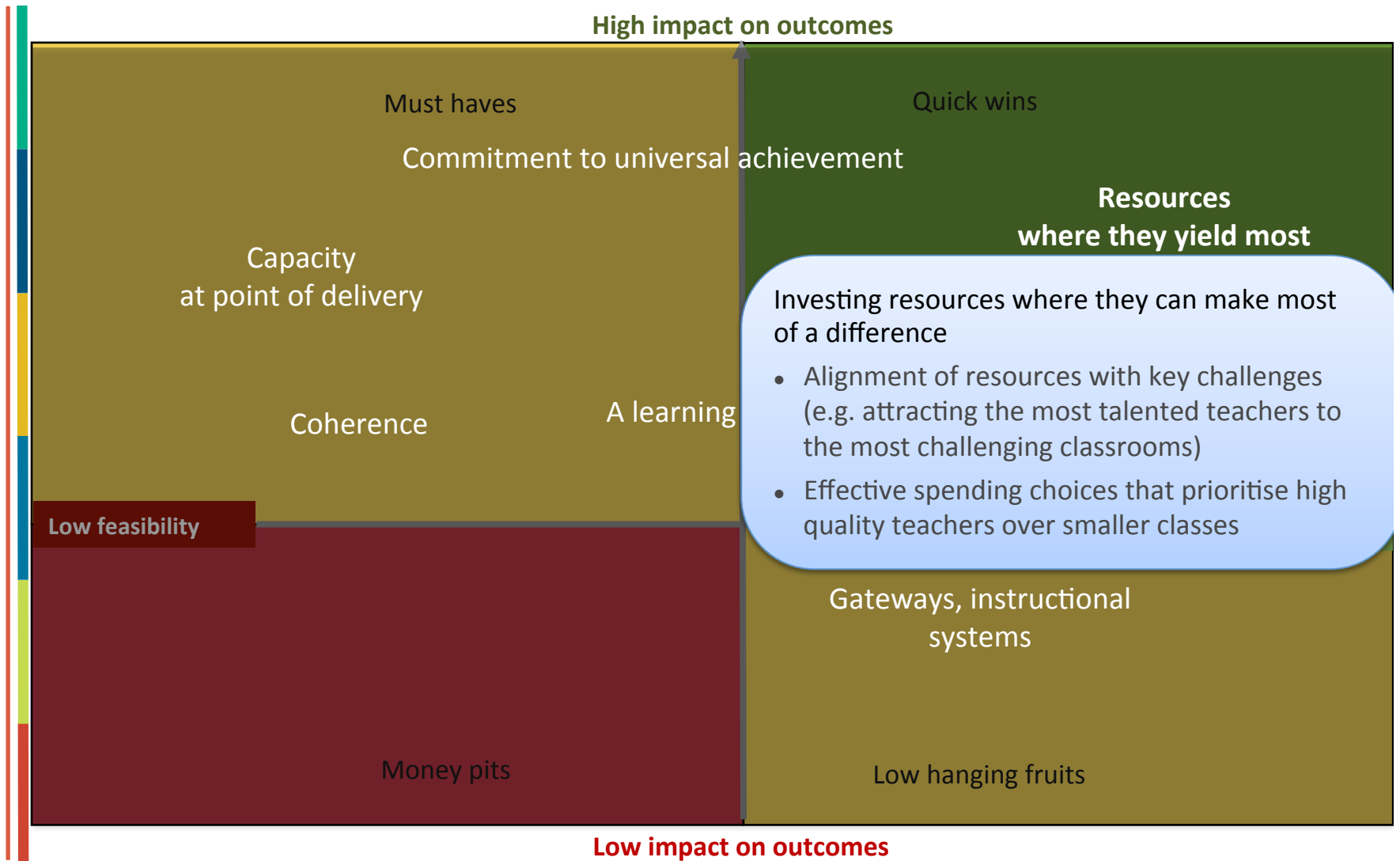
Figure II.5.8

Horizontal stratification: ability grouping

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



Lessons from PISA



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

Figure II.6.2

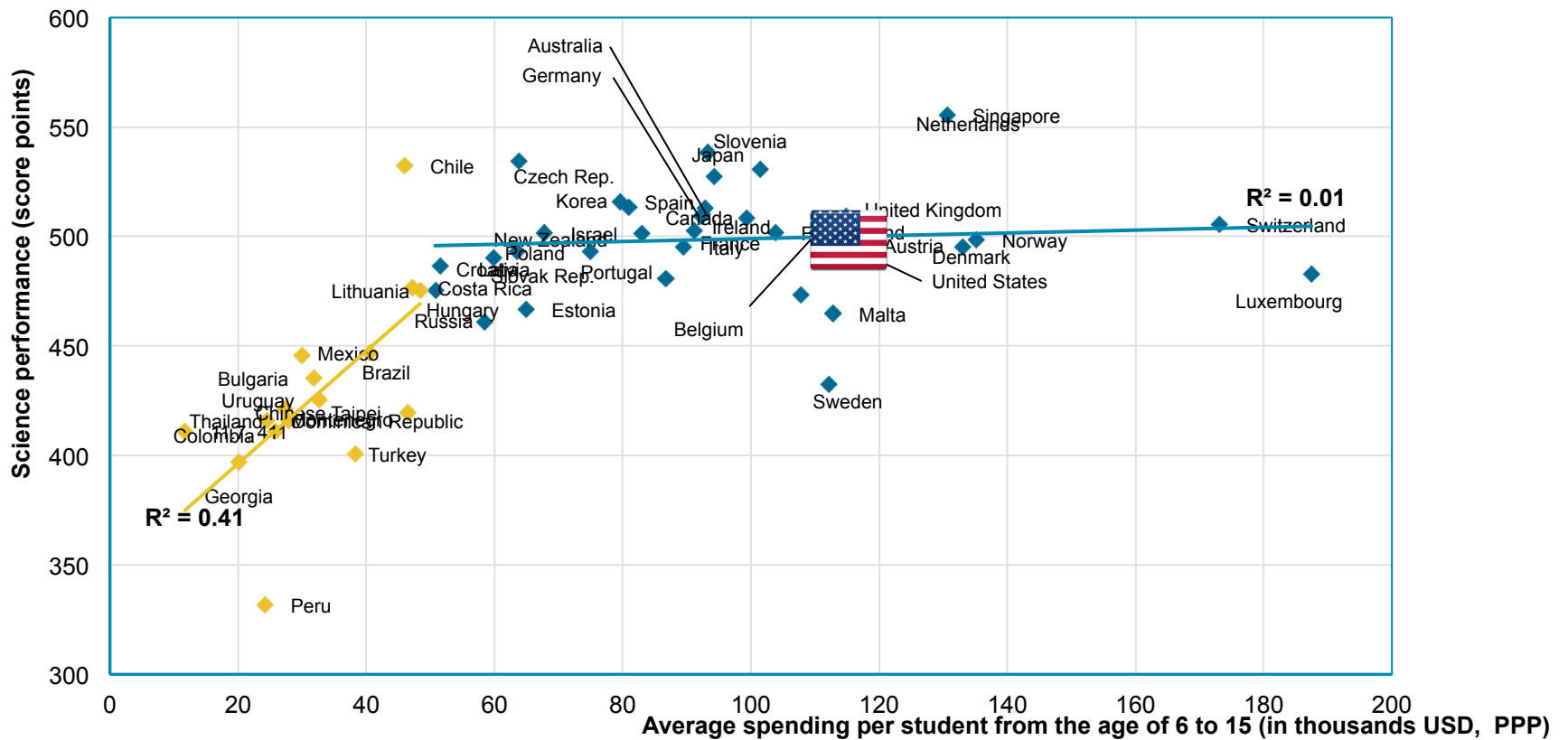
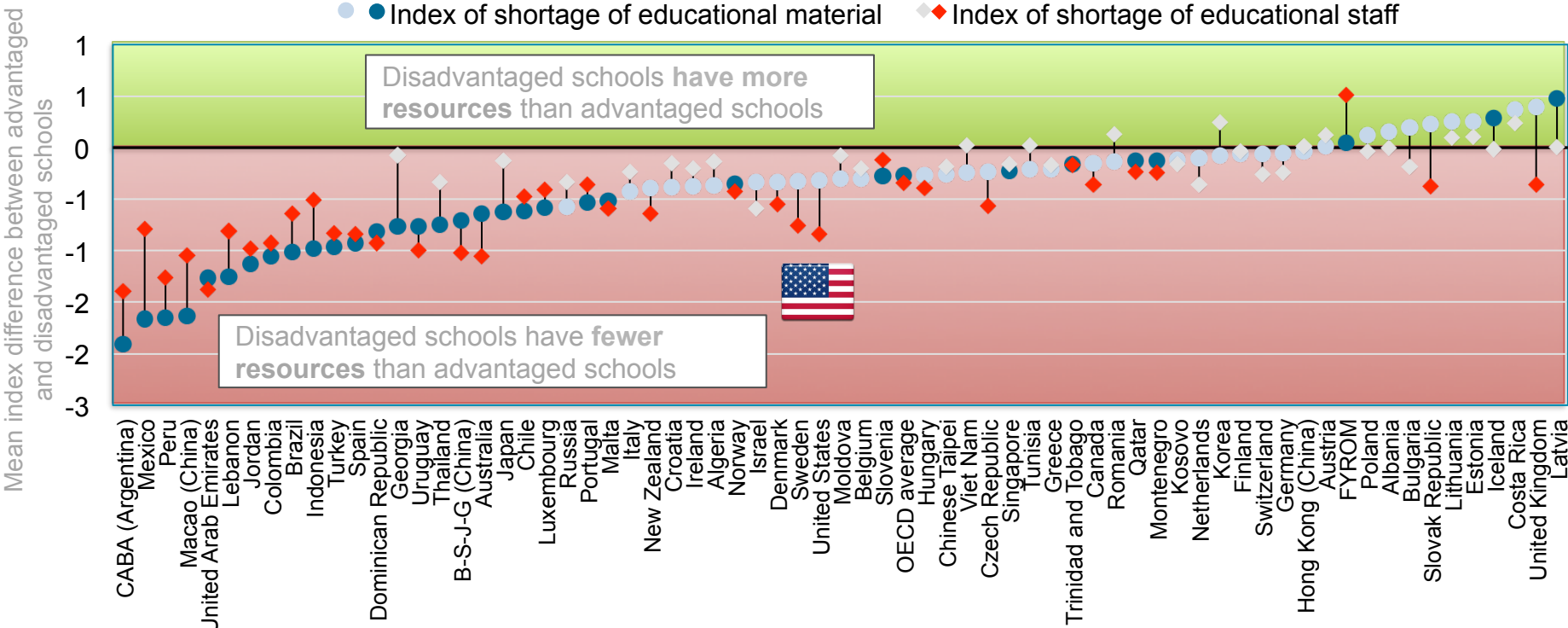


Figure I.6.14

Differences in educational resources

between advantaged and disadvantaged schools



Integrating immigrants



Figure I.7.4

Student performance in science

by immigrant background

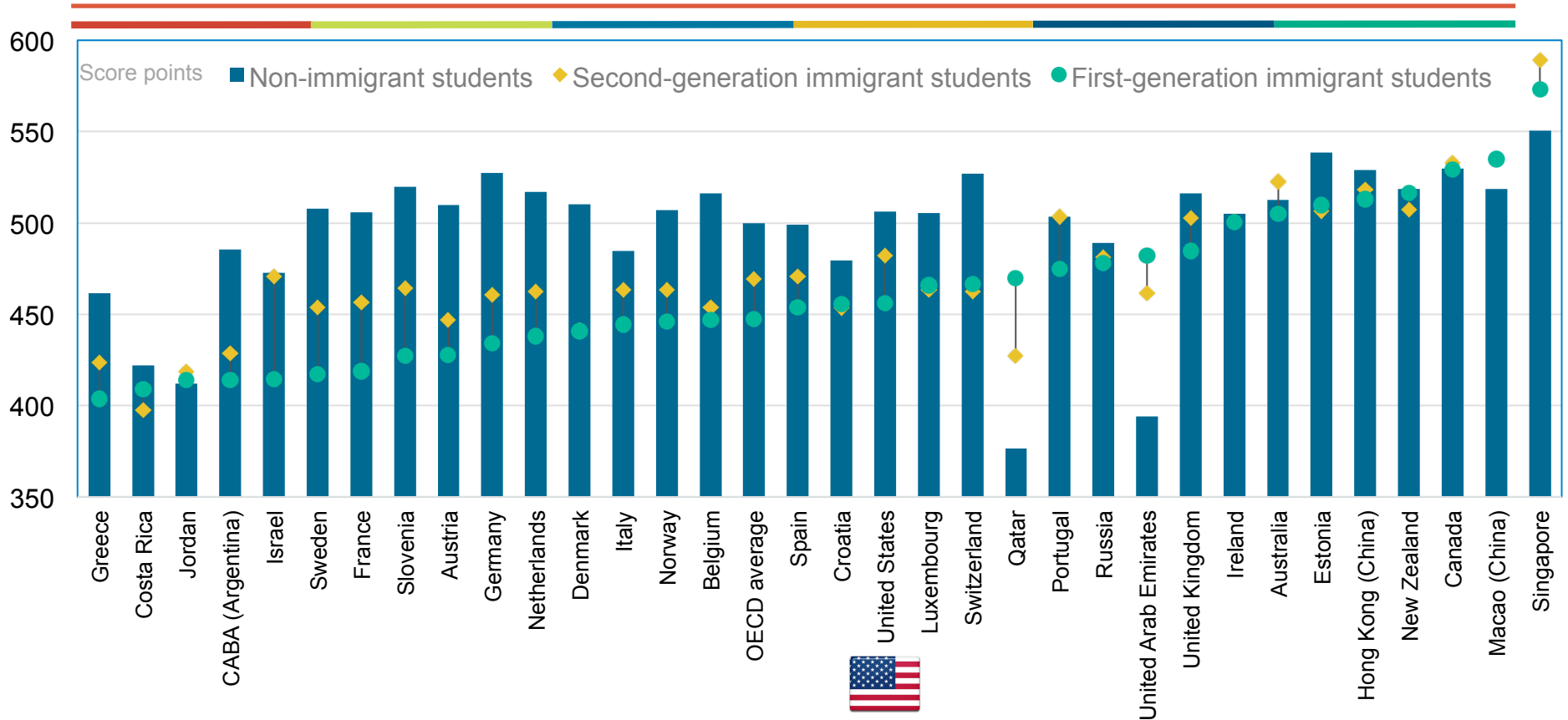


Figure I.7.3

Percentage of immigrant students and education systems' average performance in science

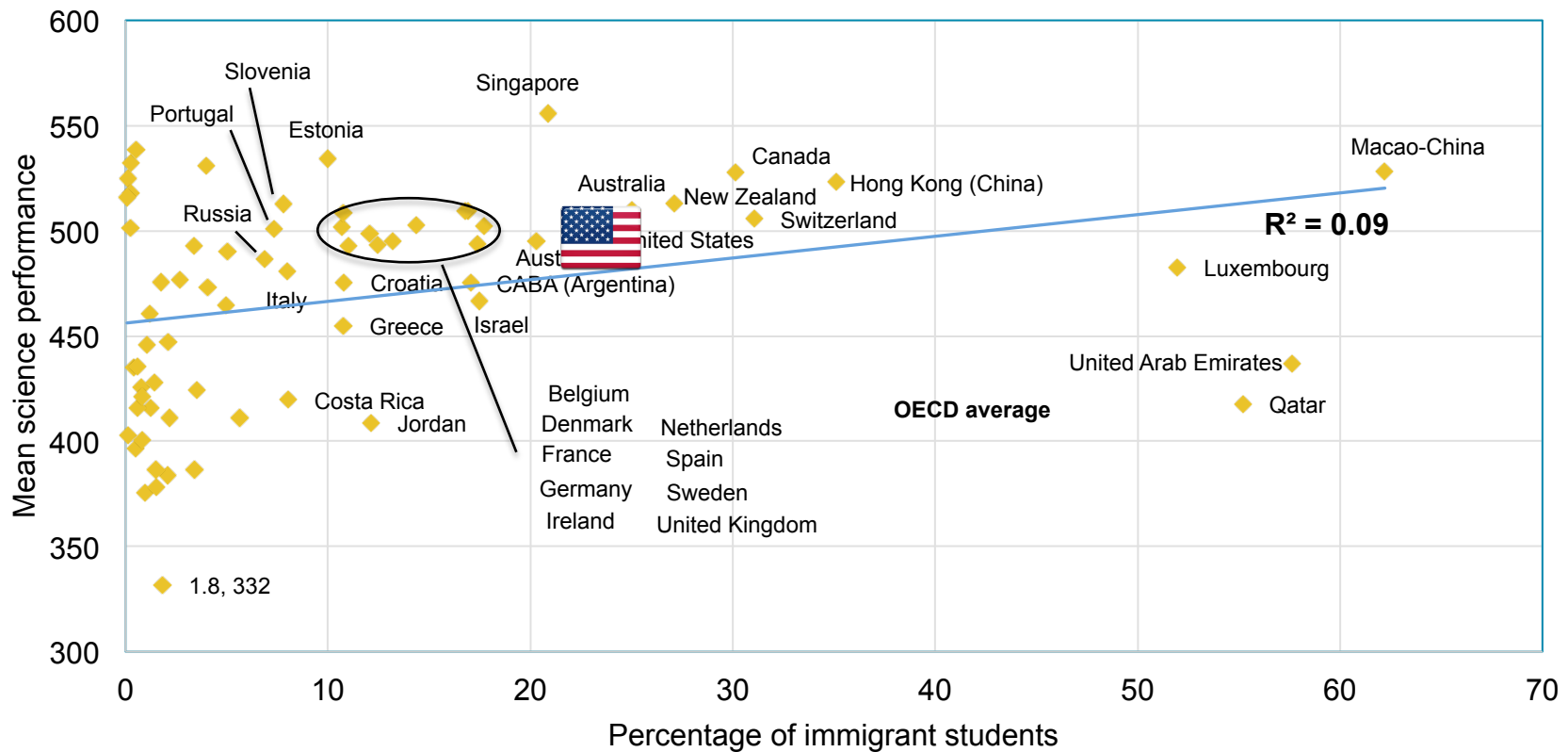
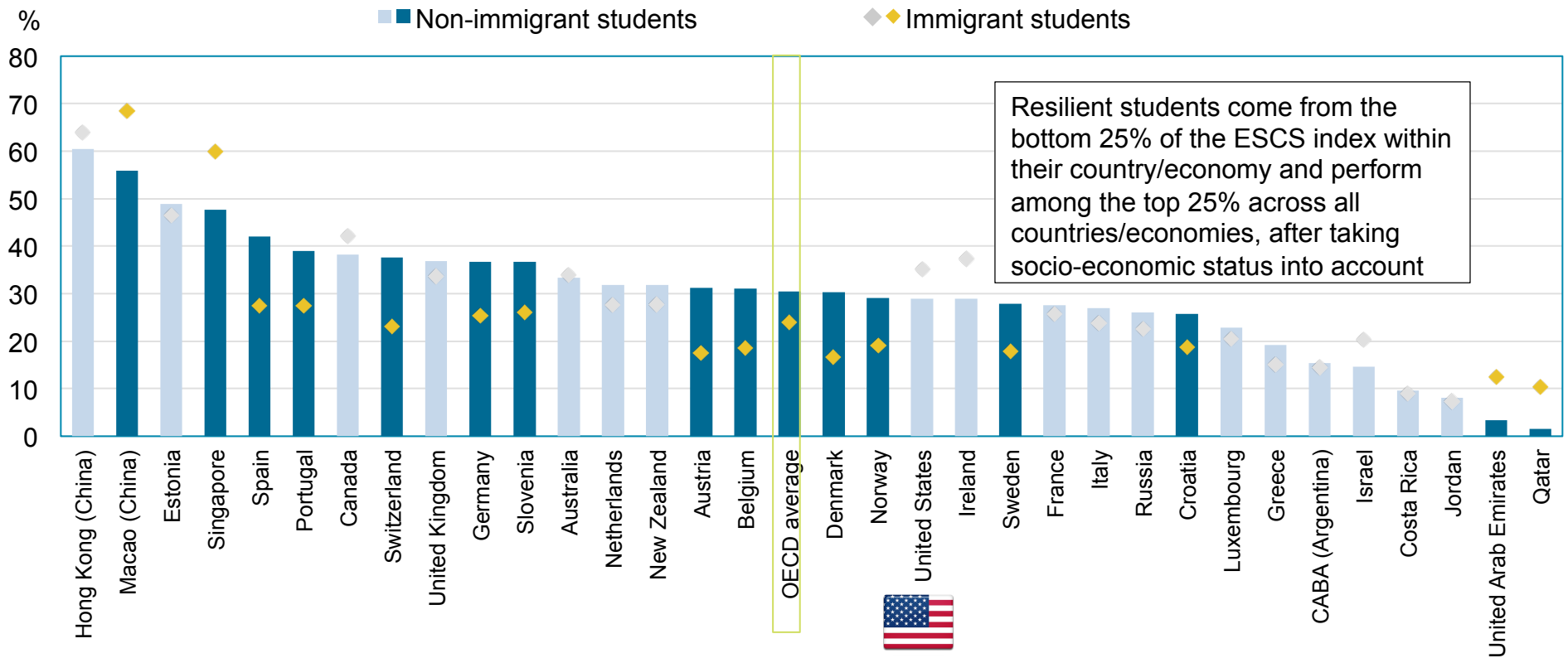


Figure I.7.8

Percentage of resilient students by immigrant background



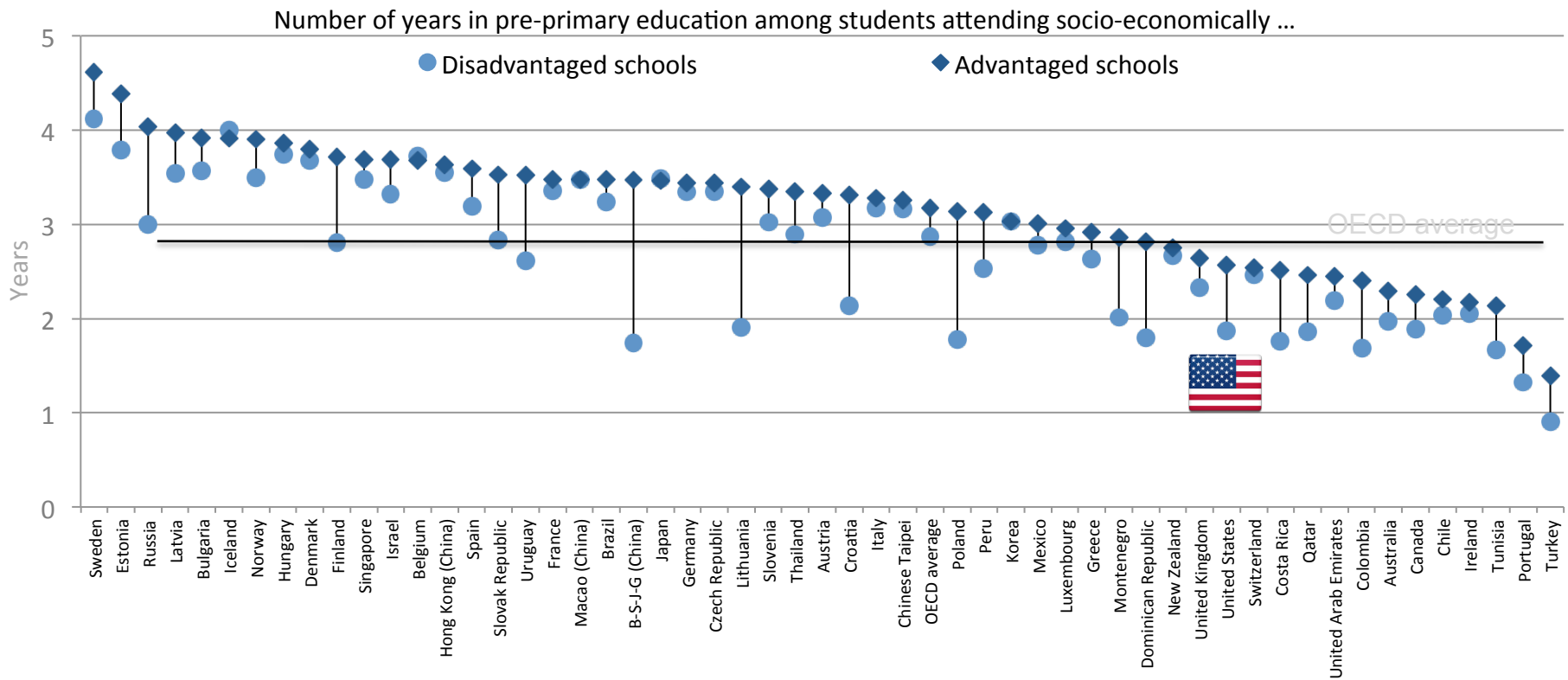
Starting strong



Table II.6.51

Attendance at pre-primary school

by schools' socio-economic profile



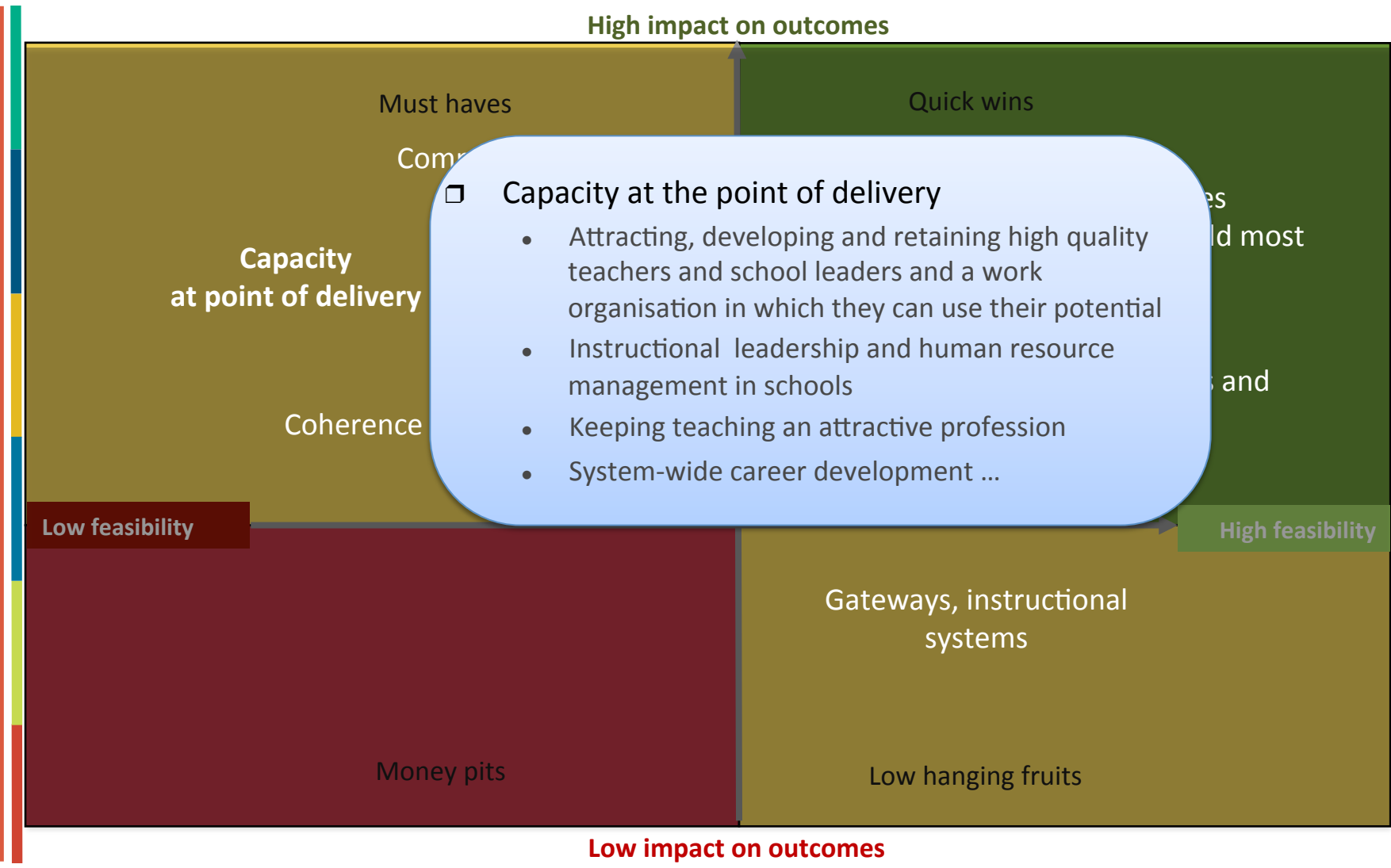
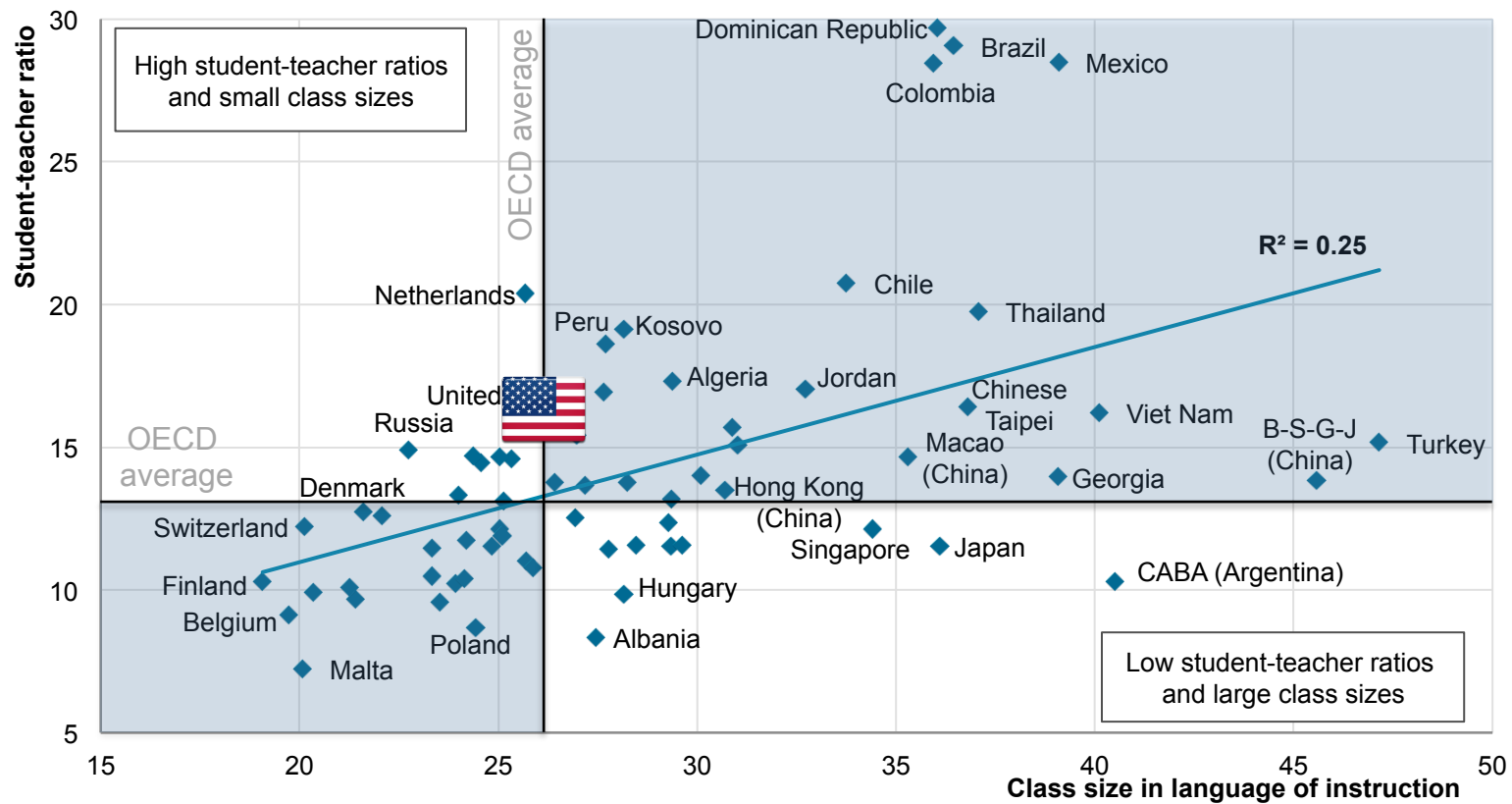
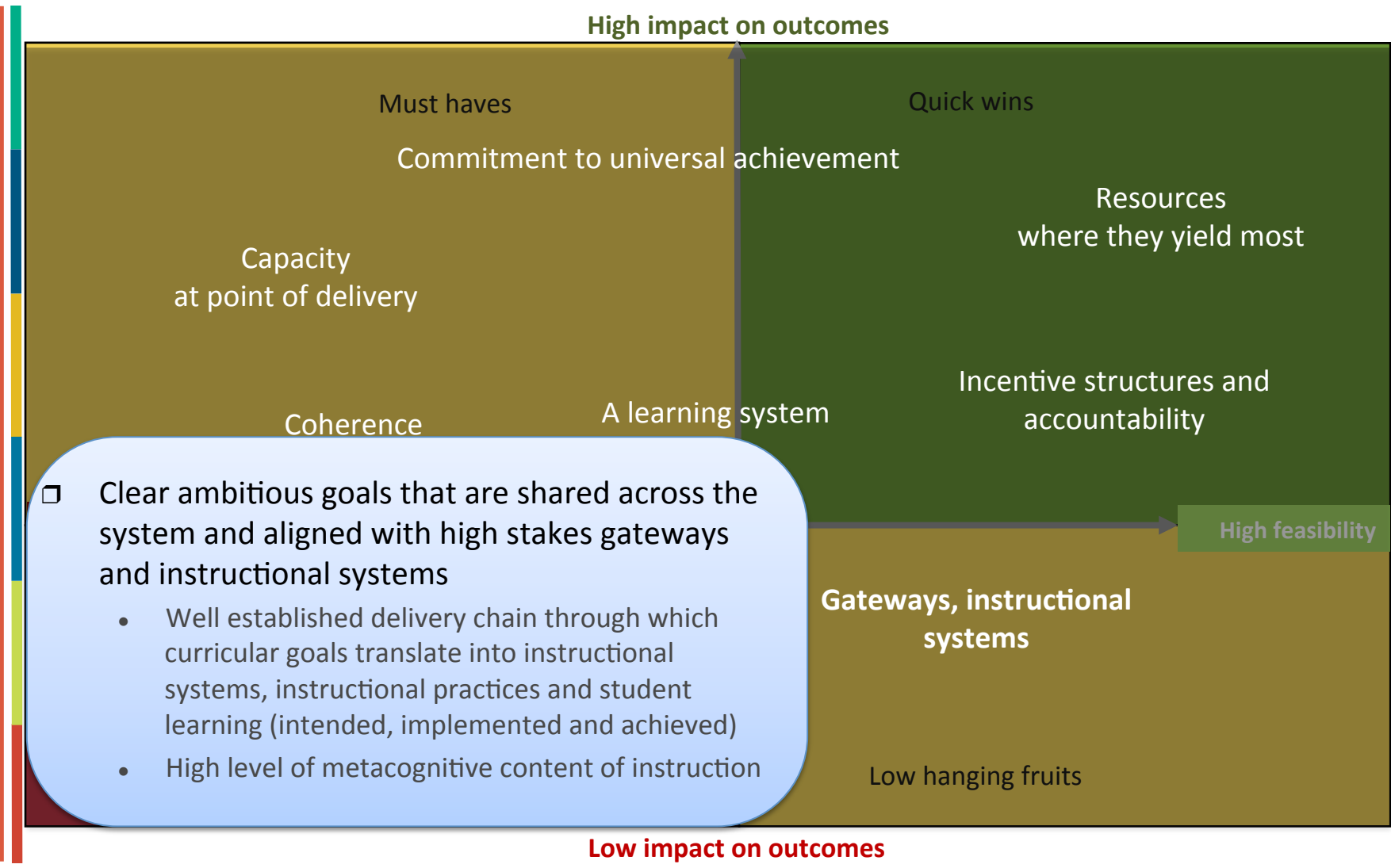


Figure II.6.14

Student-teacher ratios and class size



Lessons from PISA



The 'productivity' puzzle

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

Figure II.6.23

Learning time and science performance

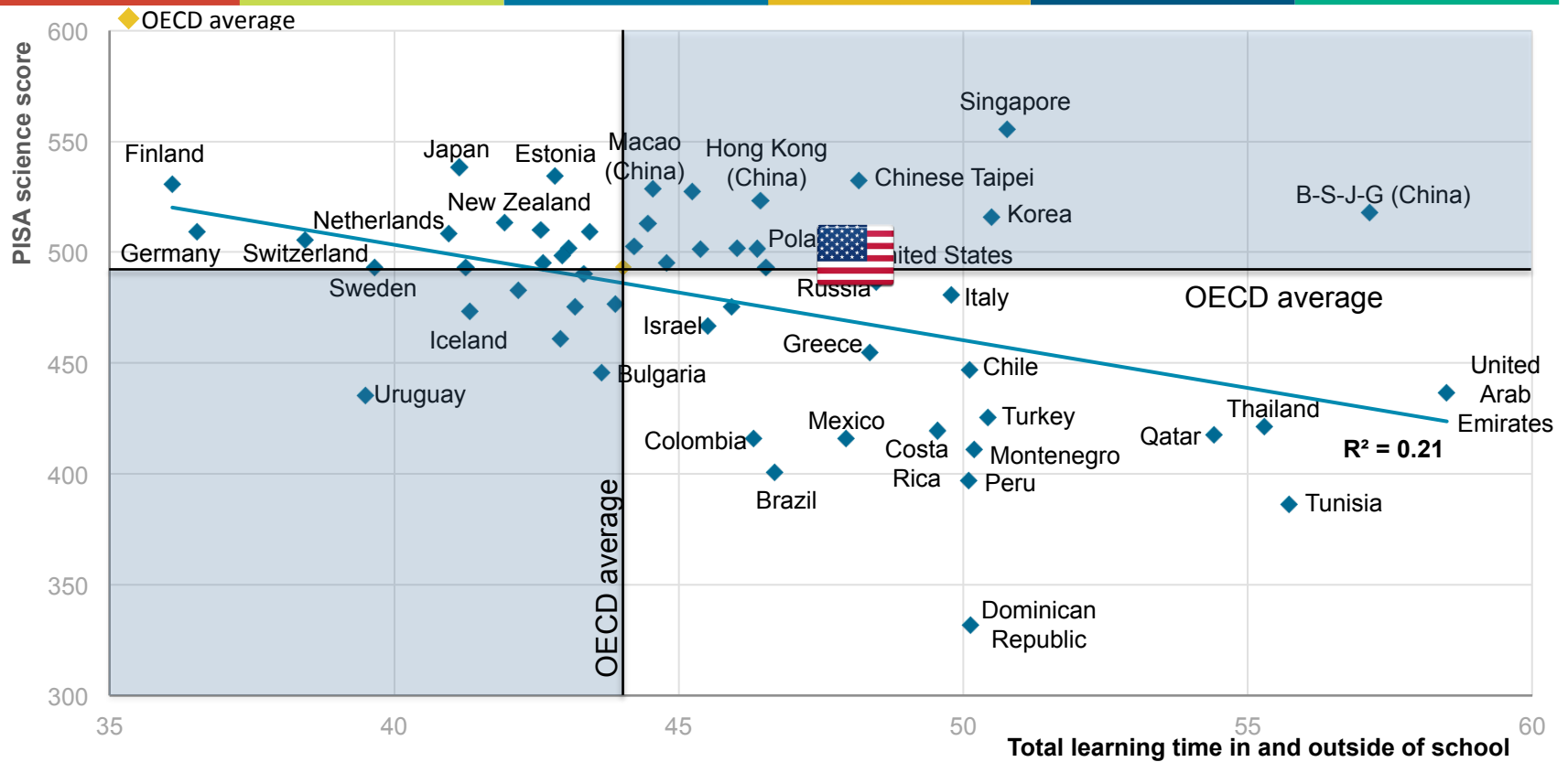
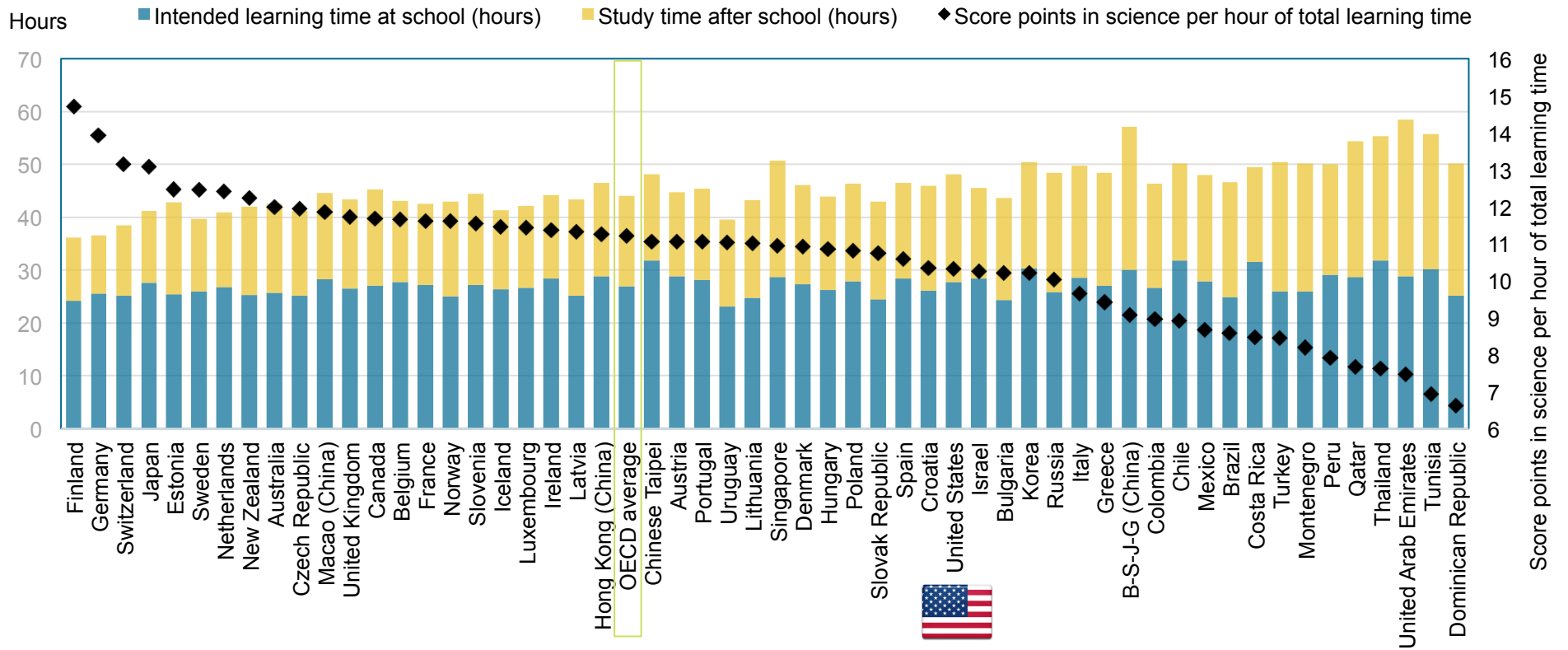


Figure II.6.23

Learning time and science performance

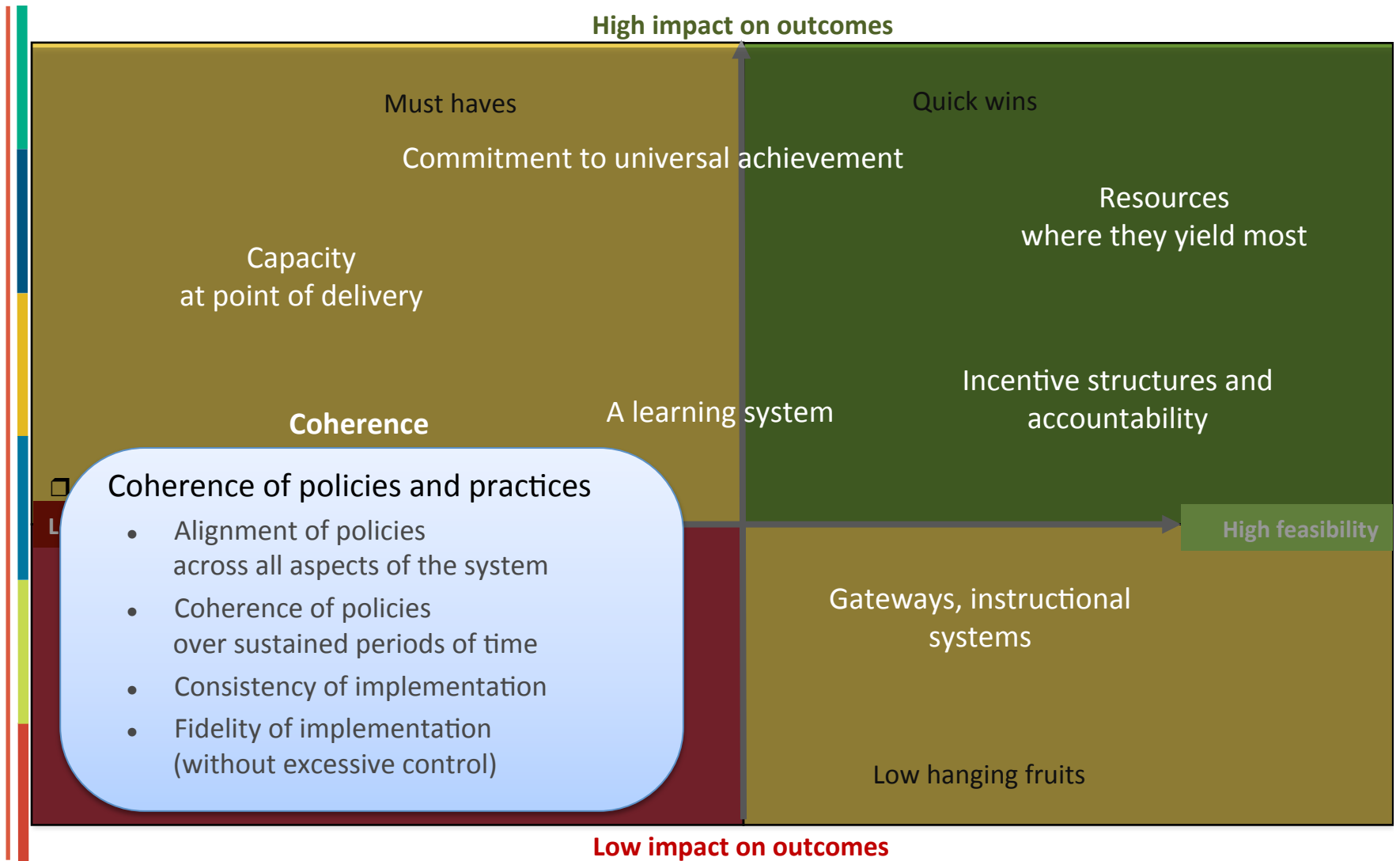


Effective teaching

A well-structured, clear and informative lesson on a topic including teachers' explanations, classroom debates and students' questions pays off, as does adaptive instruction

Inquiry-based science instruction (e.g. experimentation and hands-on activities) tends to relate negatively to performance but positively to student engagement and career expectations

Lessons from PISA



Looking forward



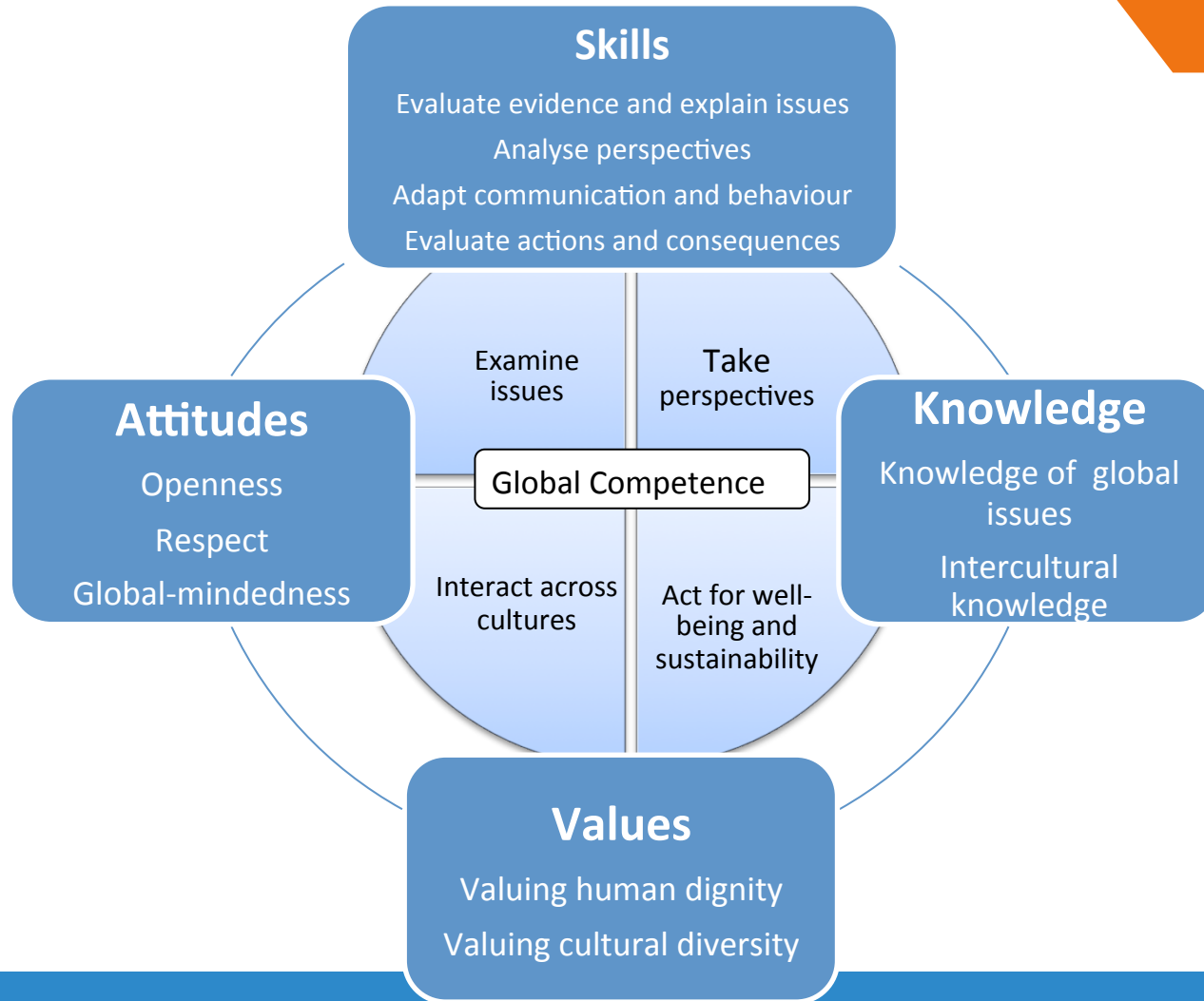
Some key questions for social cohesion and sustainable development

- How well are students prepared for life, citizenship and employment in multicultural societies and in a globalised world?
- To what degree are students able to examine contemporary issues?
- Are students able to understand and appreciate multiple cultural perspectives (including their own) and manage differences and conflicts?
- To what degree are students prepared to interact with others with respect for the inviolable rights and dignity of every individual?
- To what degree do students care about the world and take action to make a difference?



PISA definition of Global Competence

Global Competence is the capacity
to examine global and intercultural issues,
to take multiple perspectives,
to engage in open, appropriate and effective
interactions with people from different cultures
and to act for collective well-being and sustainable
development.



The instruments

Cognitive test

- A test of « **global and intercultural understanding** » that covers the cognitive components of global competence (e.g. critical reasoning with evidence, perspective taking)

Self-reported information

- Self-reported data from students on the other components of global competence (e.g. openness, adaptability), and self-reported data from principals and teachers on activities related to global and intercultural education

Average school systems

Some students learn
at high levels

Uniformity

Curriculum-centred

Learning a place

Prescription

Delivered wisdom



High performers in PISA

All students learn
at high levels

Embracing diversity

Learner-centred

Learning an activity

Informed profession

User-generated wisdom



Thank you

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