PISA

ILSAs

The OECD Programme for International Student Assessment (PISA)

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OECD
BETTER POLICIES FOR BETTER LIVES

PISA in brief

Every three years since 2000, over half a million students…

- representing 15-year-olds in now over 80 countries
- National sample sizes vary between 4000 and 30,000 students

… take an internationally agreed 2-hour test…

- Focus on mathematics, science and reading
- Problem-solving, collaborative problem-solving, creative thinking, financial literacy

… and respond to questions on…

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

Teachers, principals, parents and system leaders provide data on:

- school policies, practices, resources and institutional factors
  that help explain performance differences

Some design choices and trade-offs

ILSA’s are complements, not substitutes of other research methods

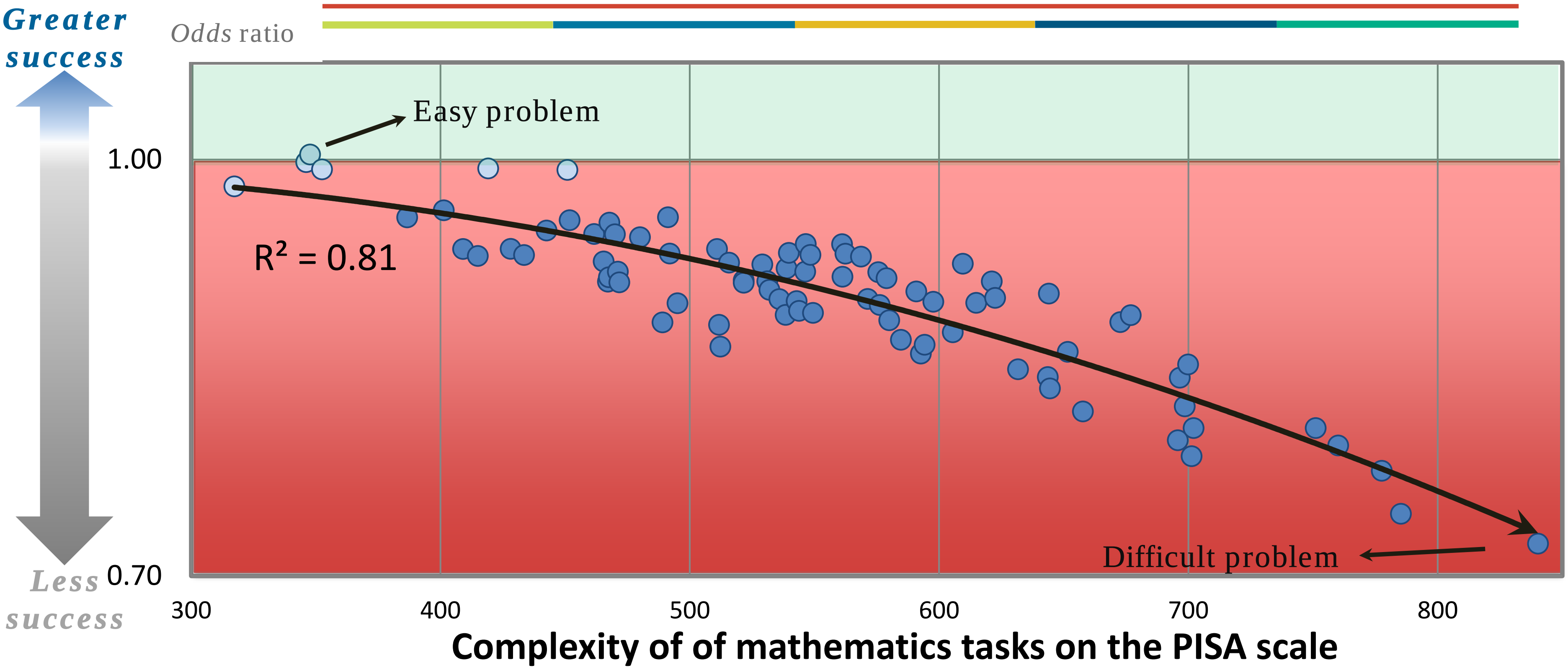
Design choices and trade-offs

- Balancing investment in measurement of **outcomes** vs. measurement of **covariates** that can help to explain outcomes
  - Improved questionnaires a priority
- **Larger samples** vs. **higher quality of measurement**
  - Greater geographic granularity of results to compare ‘apples with apples’
  - E.g. validity vs. efficiency or relevance vs. reliability
- Being open to generating **new insights and hypothesis** on the nature of relationships (fishing) vs. constraining design to answer **specific questions** (hunting)
  - ILSA’s are complements, not substitutes of other research methods
  - In particular longitudinal components place constraints on design
  - Balancing type I and type II errors

Design choices and trade-offs

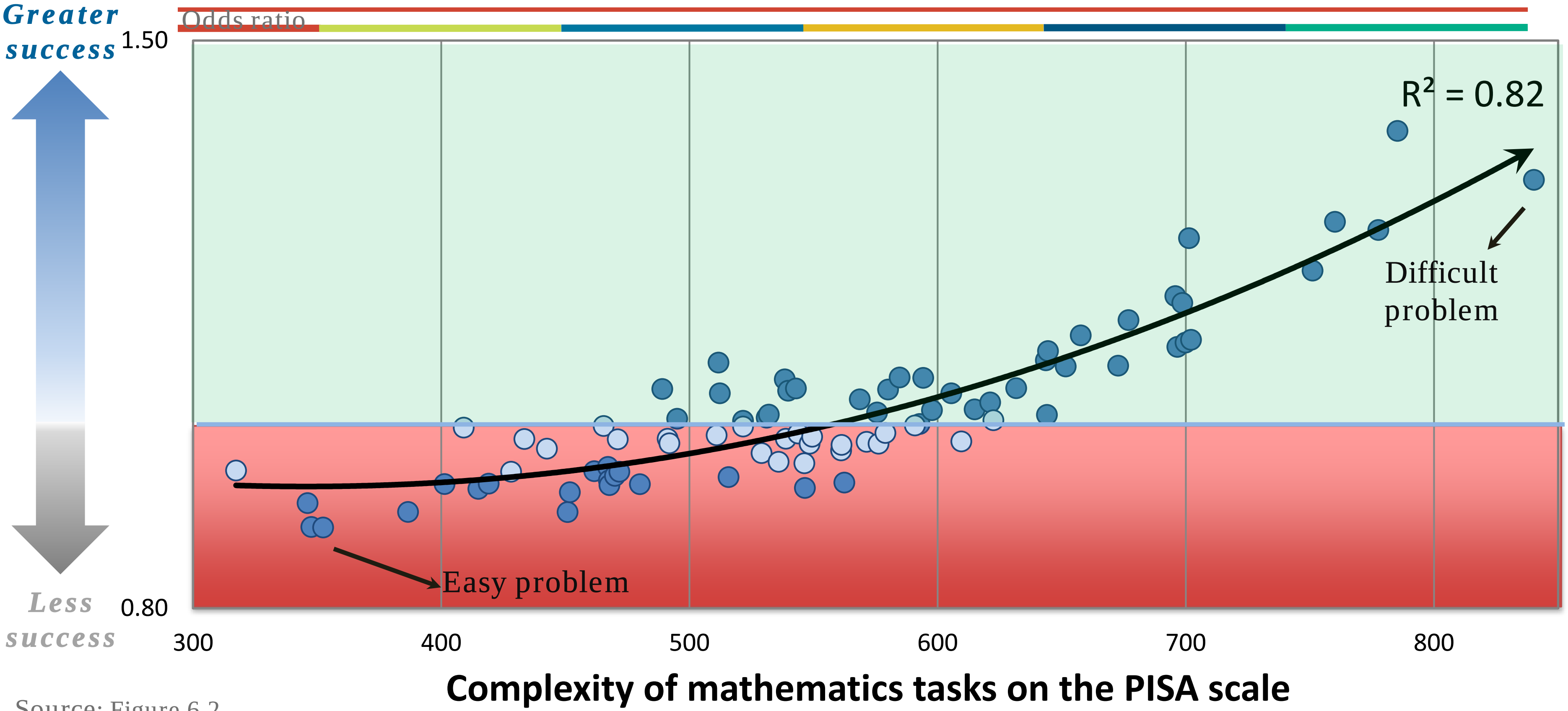
- **Measuring change** vs **changing the measures**
  - Every three years one of the frameworks is revised
    - Bridging studies for content and delivery
  - New measures are first explored through innovative assessment areas
- As **comparable** as possible but as country-specific as necessary
  - Adaptive assessment instruments
  - Greater investment in better and more modular context questionnaires
  - Integration and links with national assessments
- Frameworks **informed** but not constrained by national standards and curricula 
  - Curriculum validation studies, extensive consensus building

==Memorisation== is **less useful** as problems become **more difficult** *(OECD average)*



Source: Figure 4.3

Elaboration strategies are **more useful** as problems become **more difficult** *(OECD average)*



Source: Figure 6.2

Interpretation and reporting

Keeping things as **simple** as possible
but as complex as necessary; and as **comparable**
as possible but as country-specific as necessary

Things that can be addressed (and are)

- Comparable samples
  - Sampling errors are now well within measurement errors
  - Coverage issues addressed through supplementary studies (e.g. PISA-D)
- Meaningful units of comparisons
  - Most federal countries now collect state-level PISA data
- Better instruments to facilitate and support use of PISA data
- Investment in communication
  - Quality of media coverage has significantly evolved

Policy-uses and limitations

The perfect can be the enemy of the good (and remember that without measurement policy-makers may just throw a coin)

A world without PISA

- One question is whether ILSA’s meet the methodological requirements of some gold standard of social research…

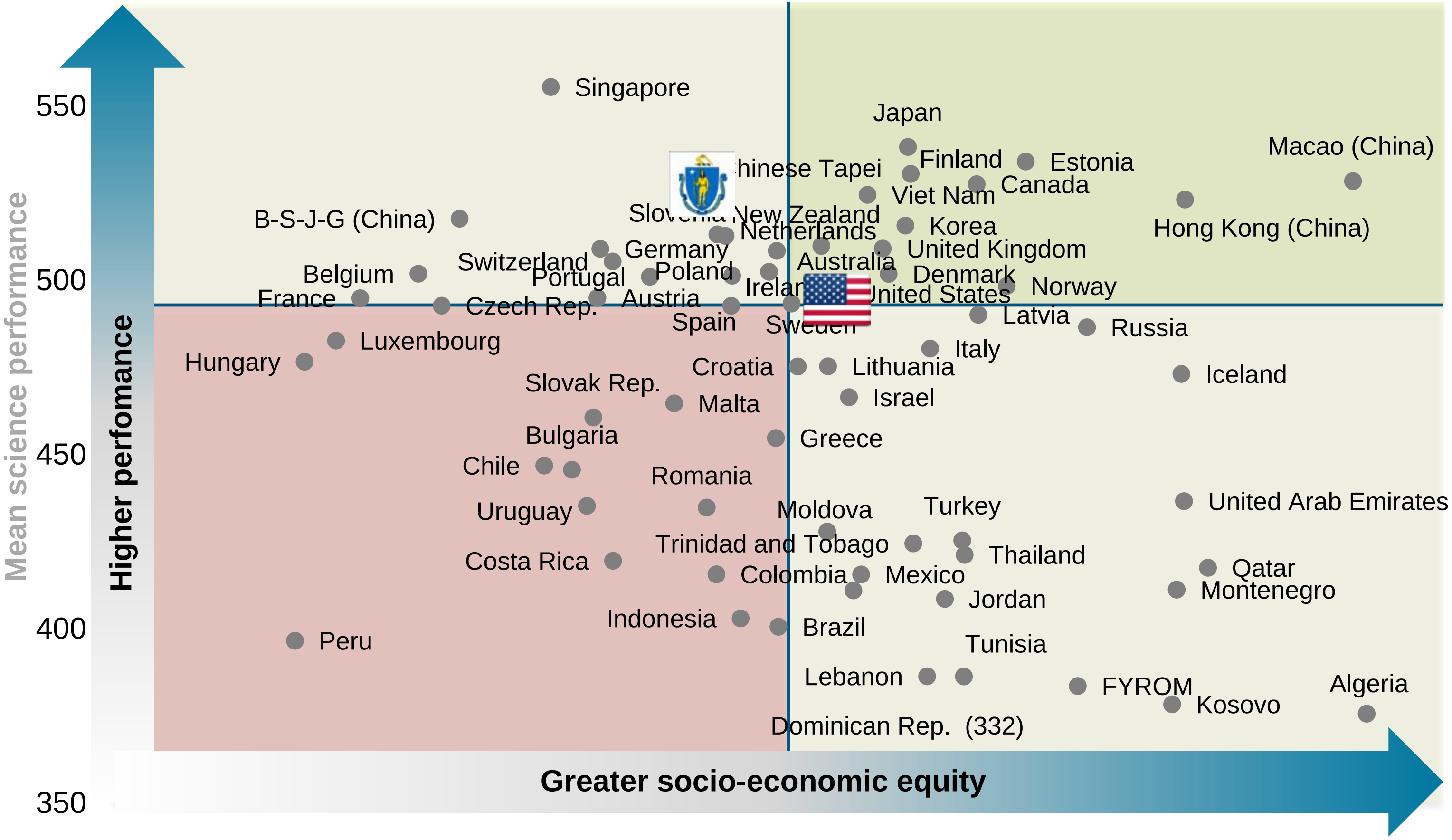
… another question is what the state of knowledge and policy development, both nationally and internationally, would have been without them.

Some scientific revolutions have started with controlled experiments, many have started with better measurement

A world with PISA

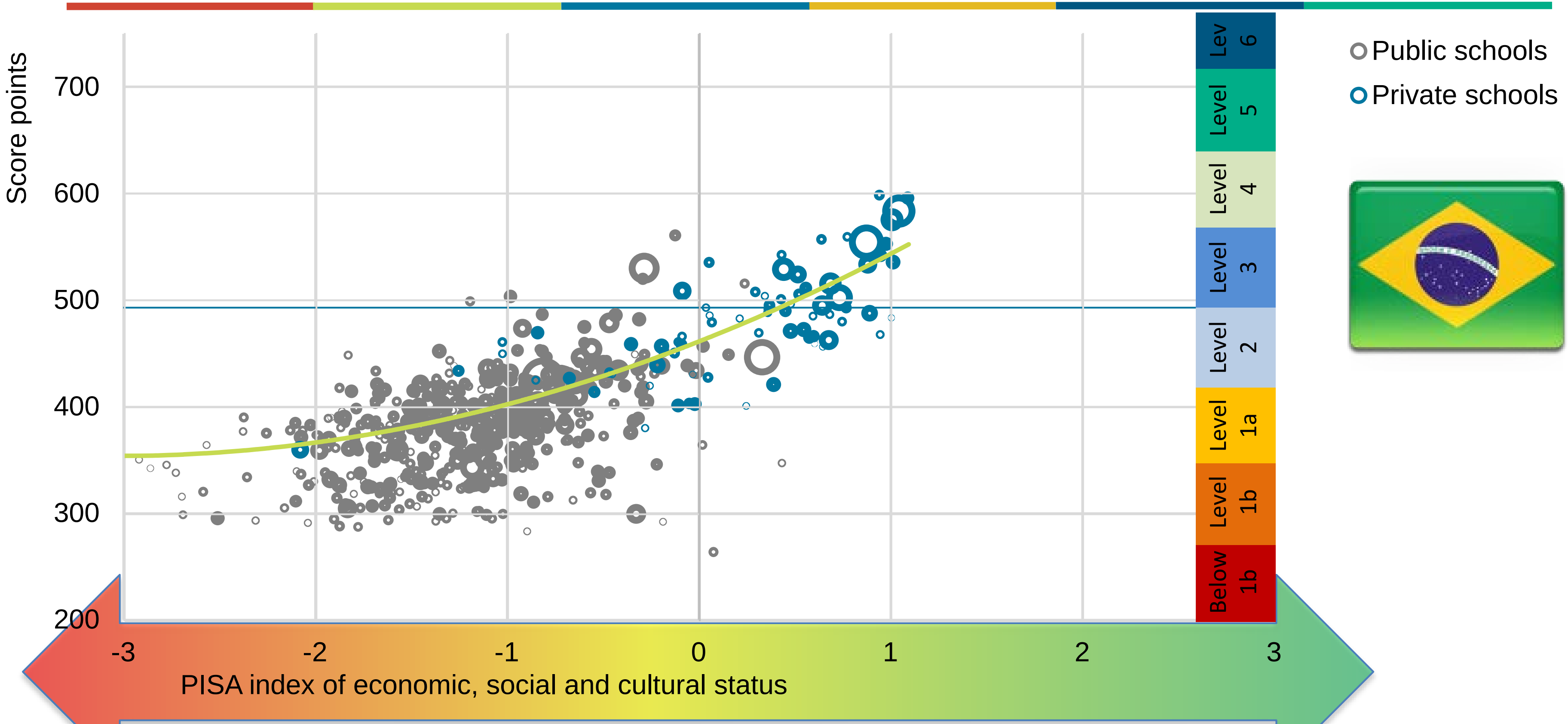
- Seeing what is possible in education
  - Helping policy-makers and educators to look outwards
- Placing national standards in a broader perspective
- Exposing ‘grade inflation’
- Contextualising curricular choices
- Lowering the political cost of action
- Raising the political cost of inaction
- Generating hypotheses

Science performance and equity in PISA (2015)

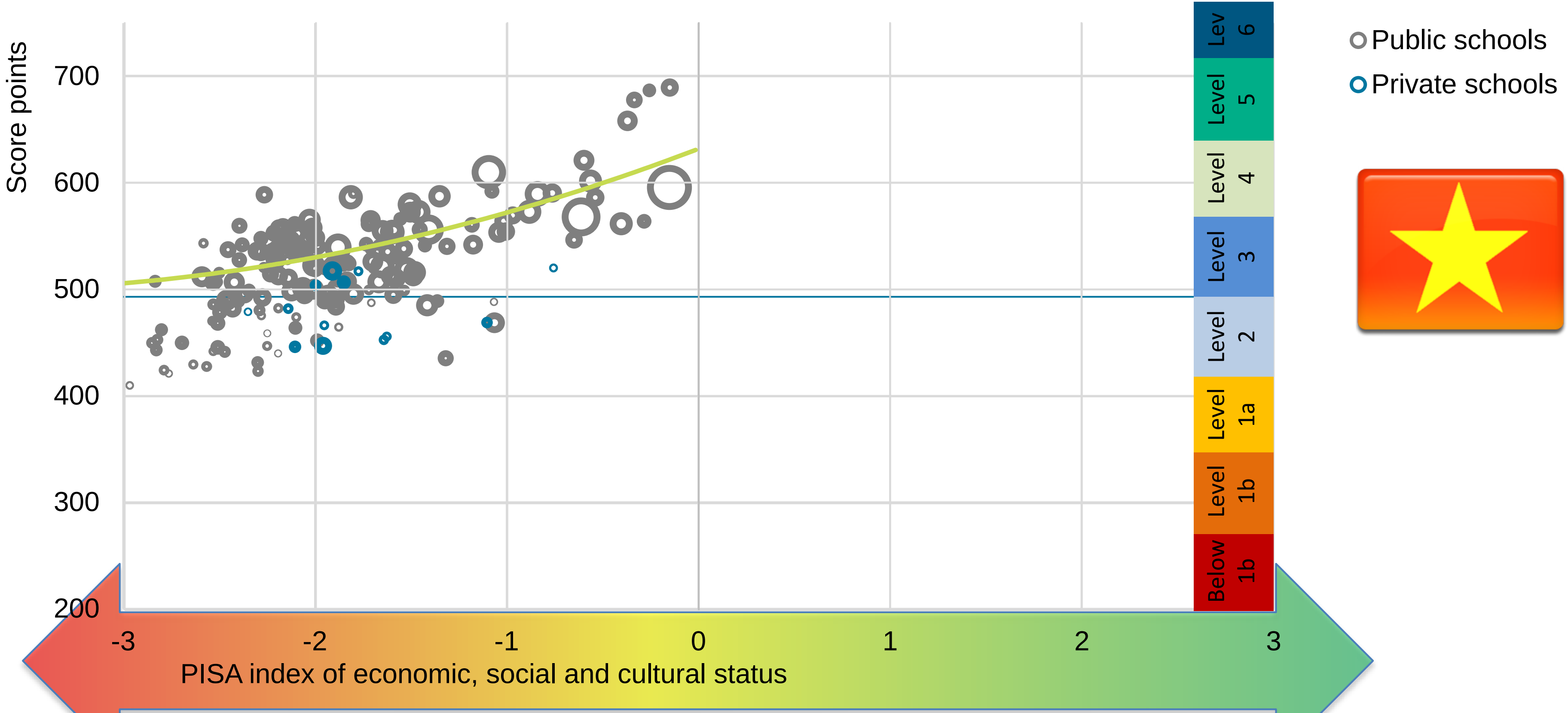


Some countries combine excellence with equity

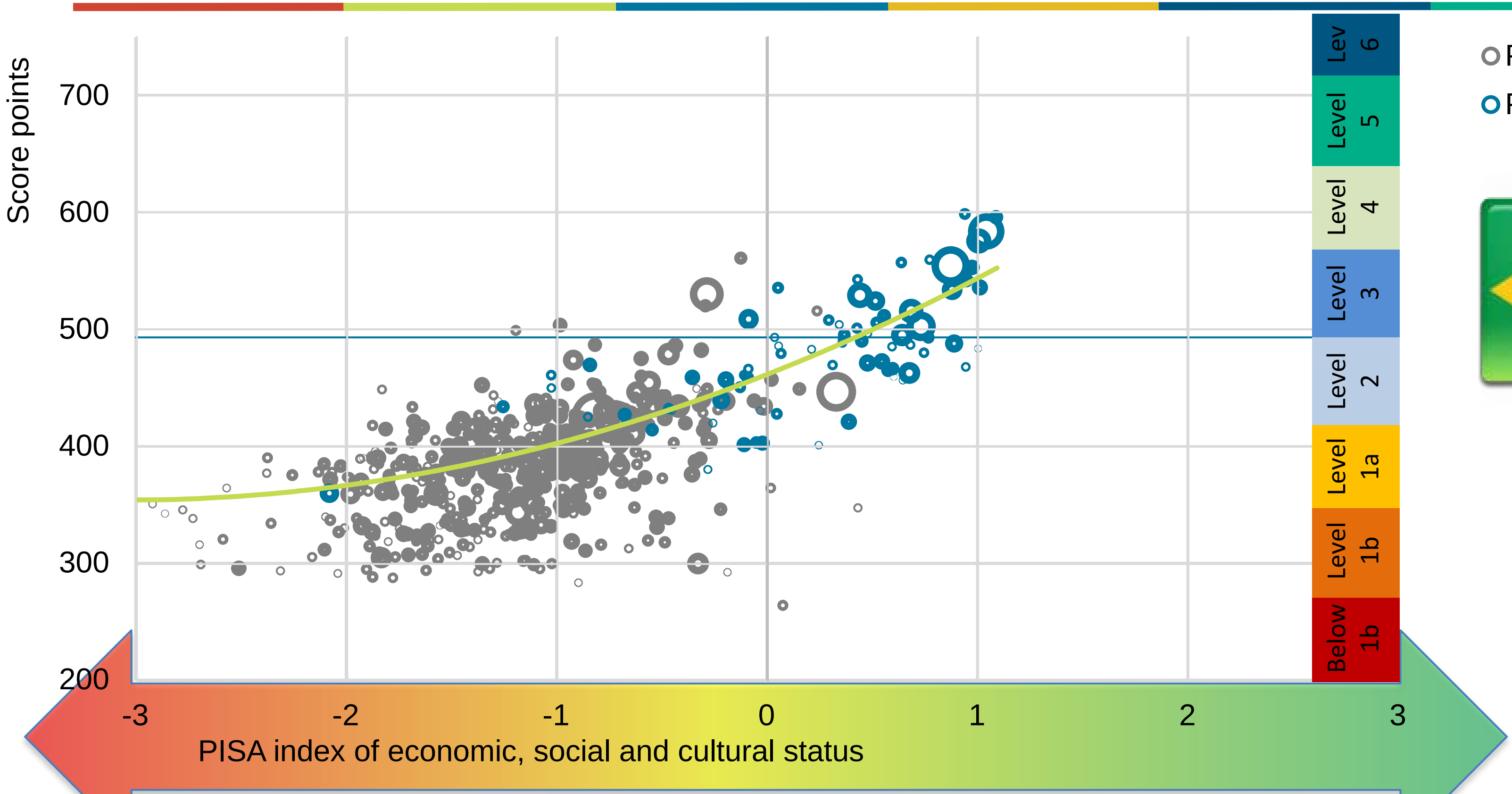
Brazil: School performance and schools’ socio-economic profile



Viet Nam: School performance and schools' socio-economic profile

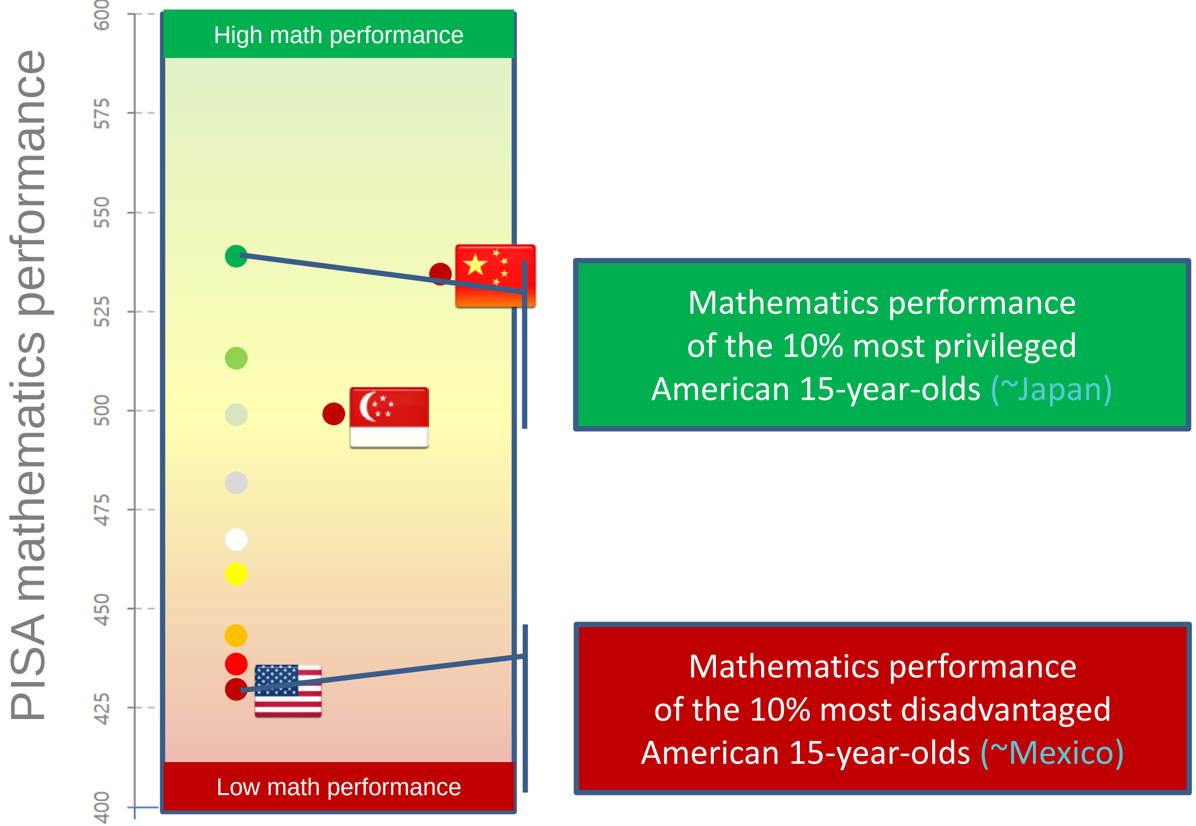


Brazil: School performance and schools' socio-economic profile



Comparing apples with apples and oranges with oranges

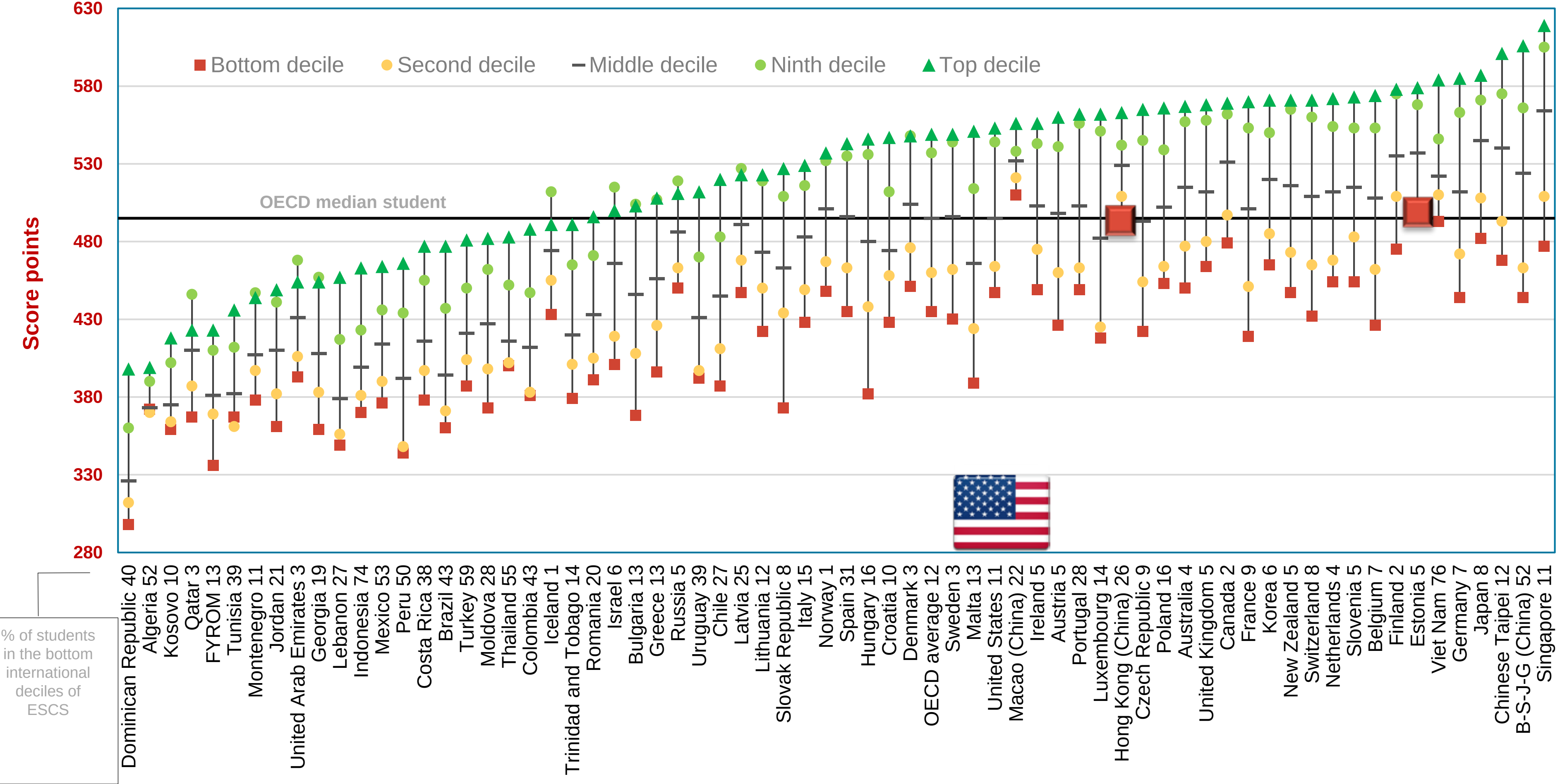
PISA math performance by decile of social background



Poverty is not destiny – Learning outcomes

Figure I.6.7

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



Generating hypotheses

Making policy alternatives visible

Category 1.
Analyse policy variation across countries

Country-level correlation and partial correlation

Three-level regression models

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

Figure II.6.2

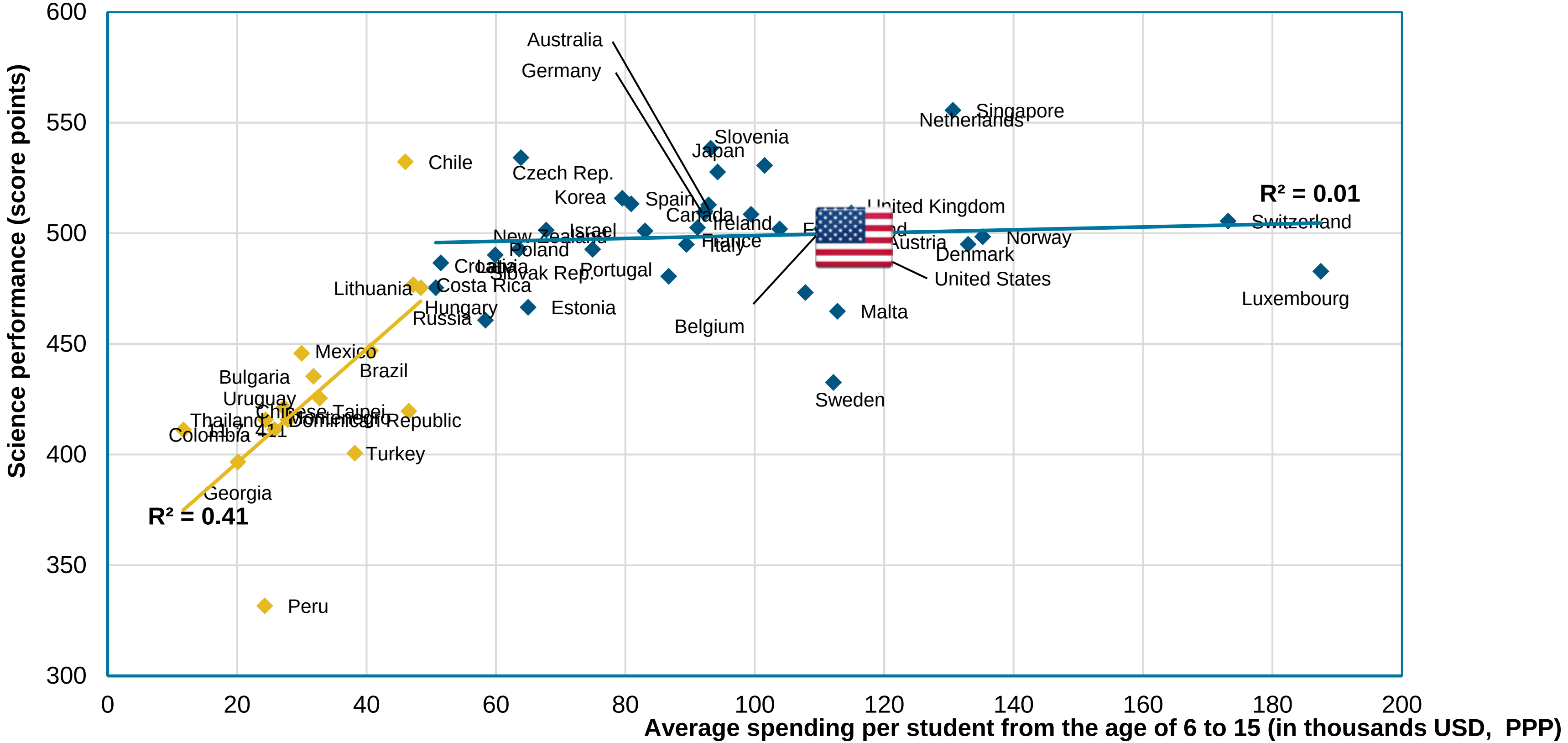
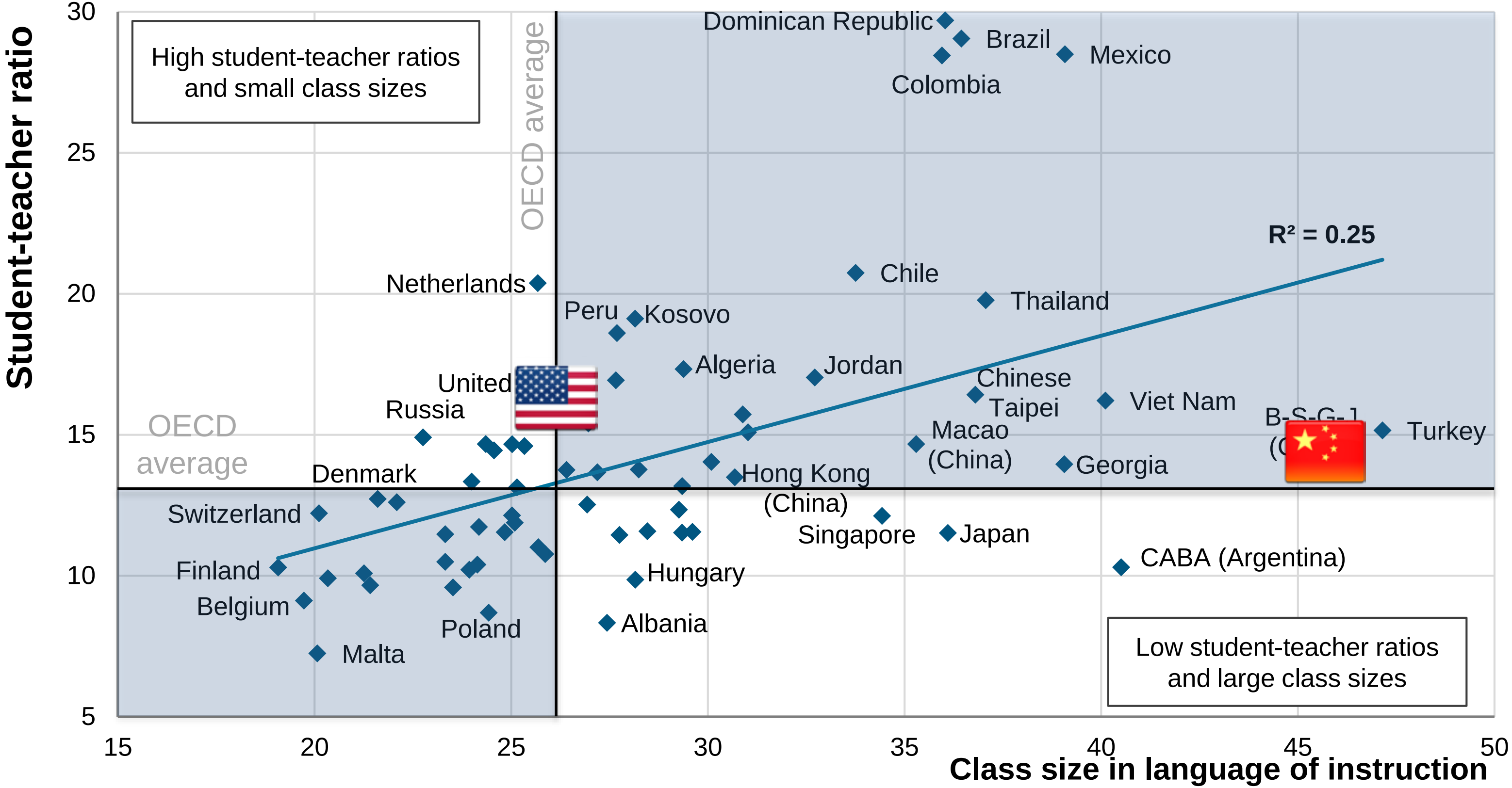


Figure II.6.14

Student-teacher ratios and class size



Learning time and science performance

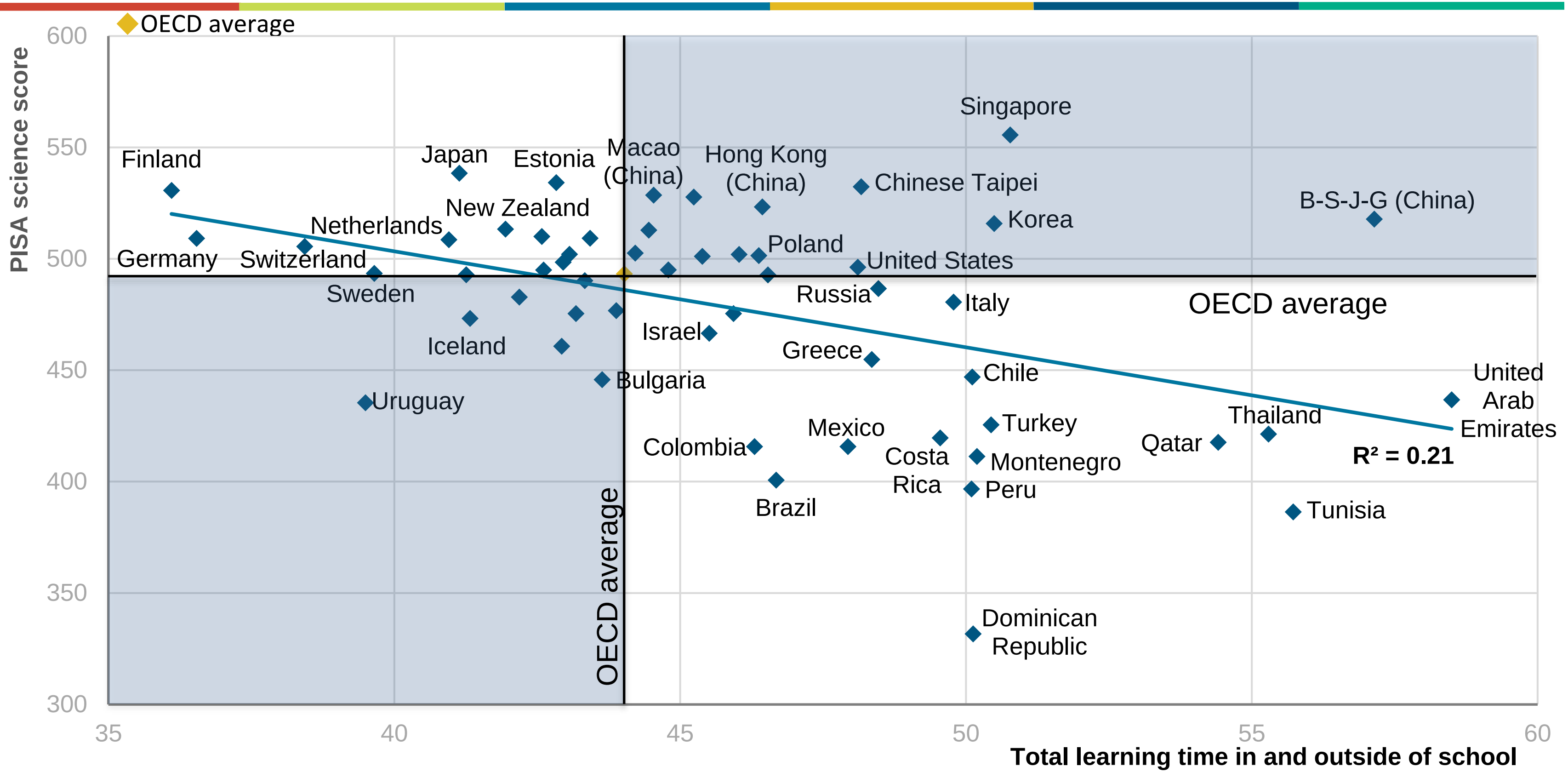
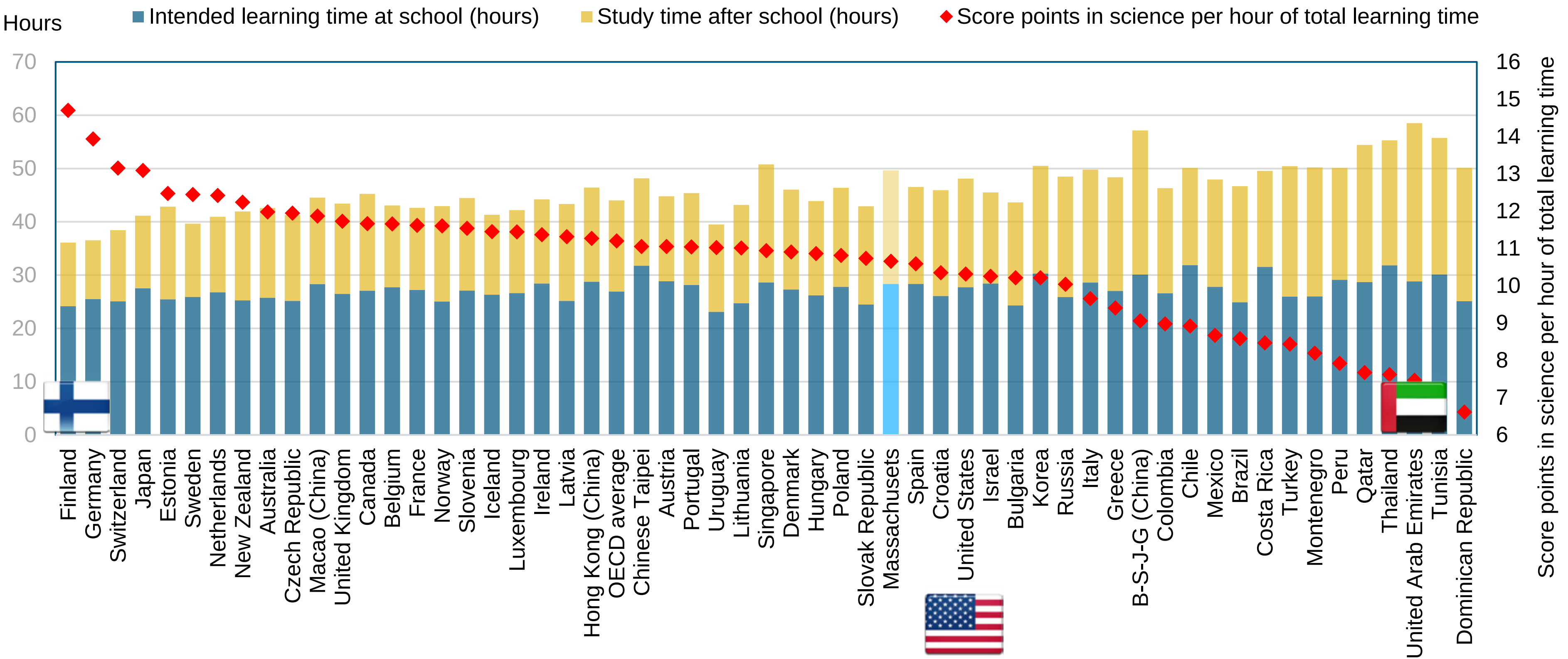


Figure II.6.23

Learning time and science performance



Category 2.
Analyse policy variation within countries

Regression models, by country

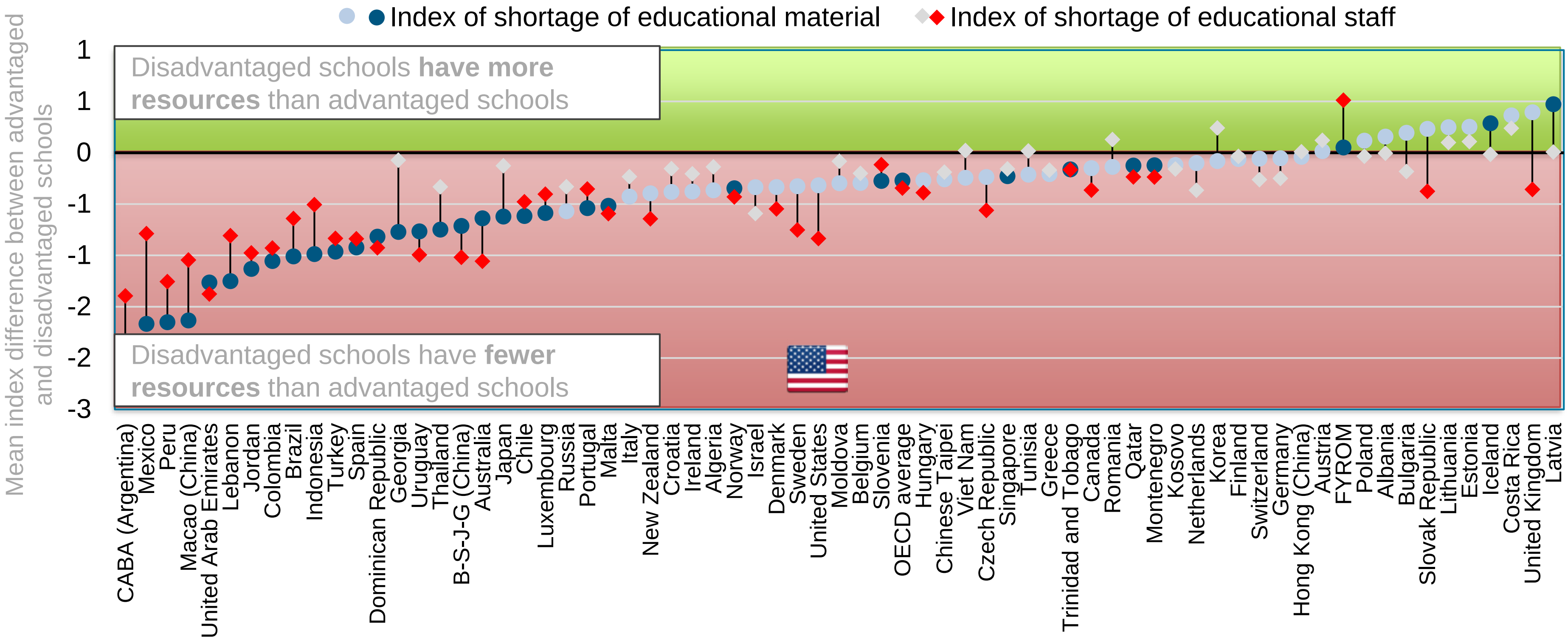
School fixed-effects models

Student fixed-effects models

Figure I.6.14

Differences in educational resources

between advantaged and disadvantaged schools



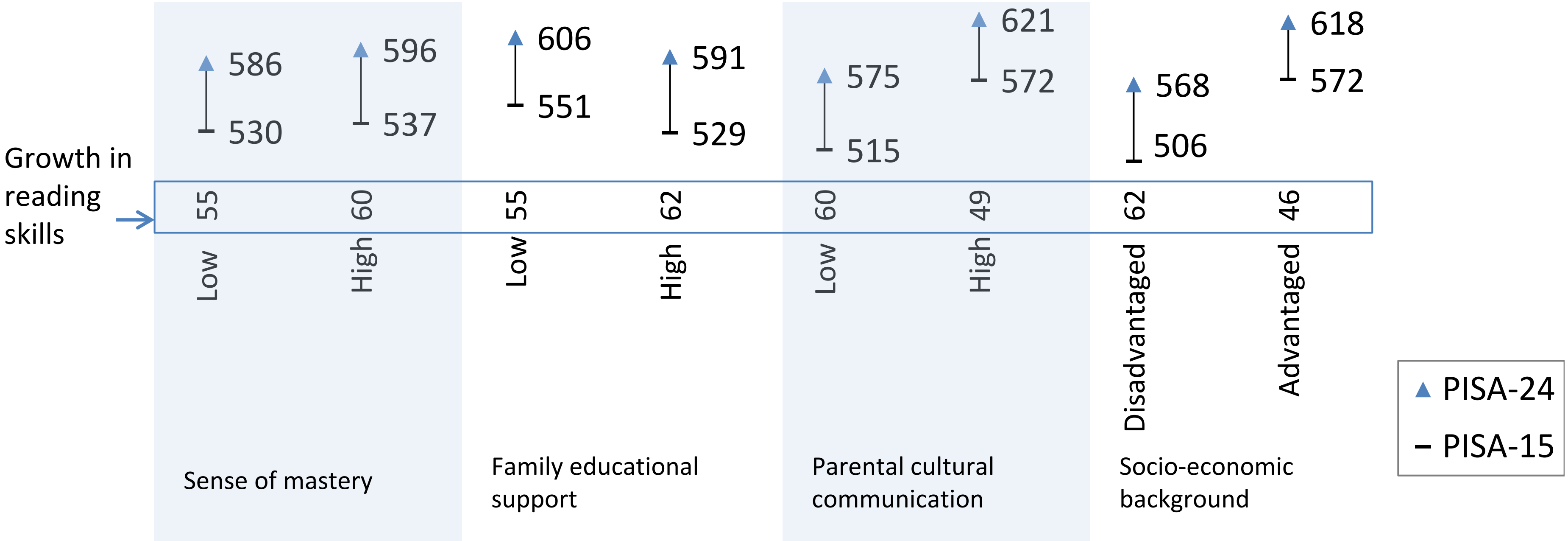
Category 5.
Analyse ILSA data that follow the same students over time.

Canadian YITS study

Canadian PISA/YITS study

Learning beyond Fifteen

Improvements in reading skills between the ages of 15 and 24, by individual and family-related factors associated with skills at age 15



In conclusion

- ILSA’s can help policy-development in many ways
  - Seeing what is possible in education
    - Helping policy-makers and educators to look outwards
  - Putting national standards in a broader perspective
  - Exposing ‘grade inflation’
  - Lowering the political cost of action
  - Raising the political cost of inaction
  - Generating hypotheses
- See ILSA’s as complements, not substitutes of other research methods
  - Don’t overload ILSA’s with unrealistic expectations and avoid time and energy traps
- Don’t underplay but also don’t overplay RCTs
  - Neuroscience, big data, predictive analytics
- Keep limitations in mind when reporting results

Thank you

Find out more about our work at www.oecd.org/pisa

- **All publications**
- **The complete micro-level database**

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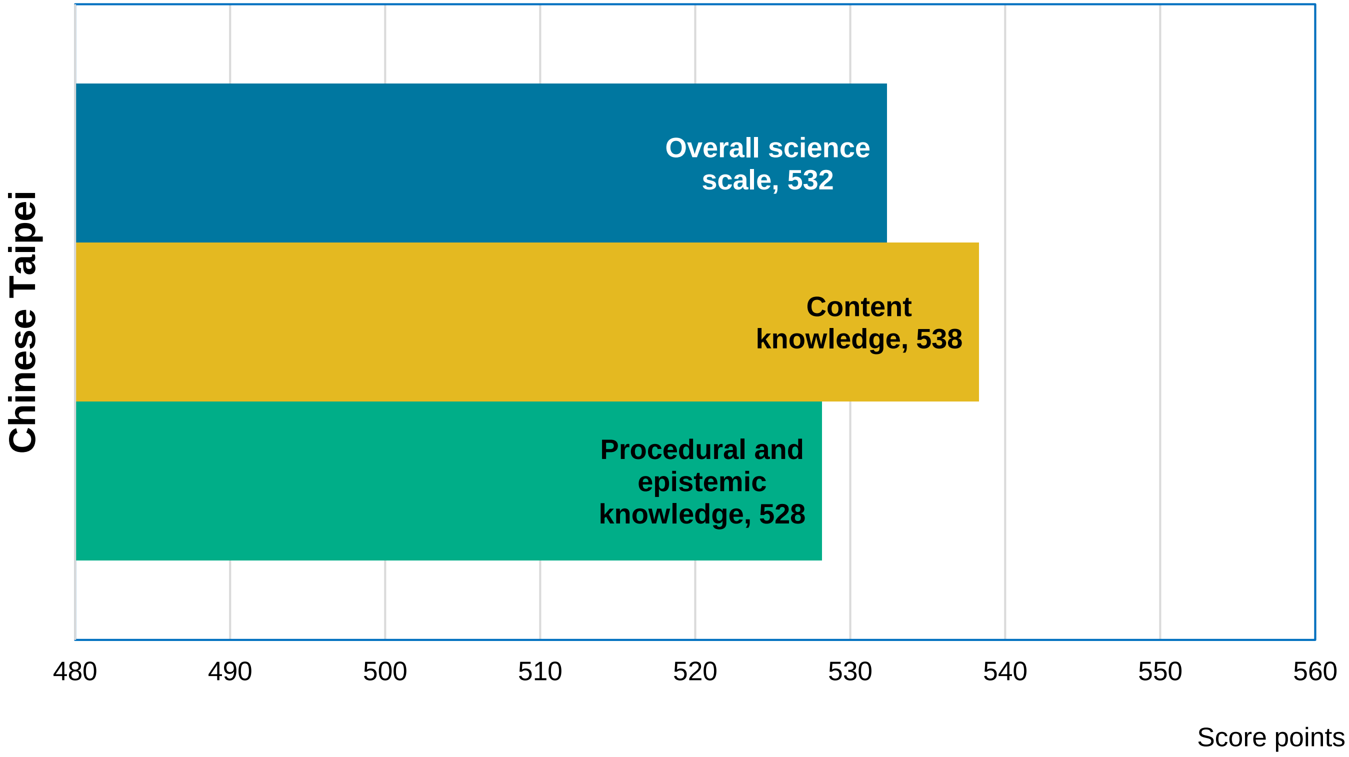
Multi-dimensional constructs

Comparing countries and economies on the different science knowledge subscales

Figure I.2.30



Comparing countries and economies on the different science knowledge subscales

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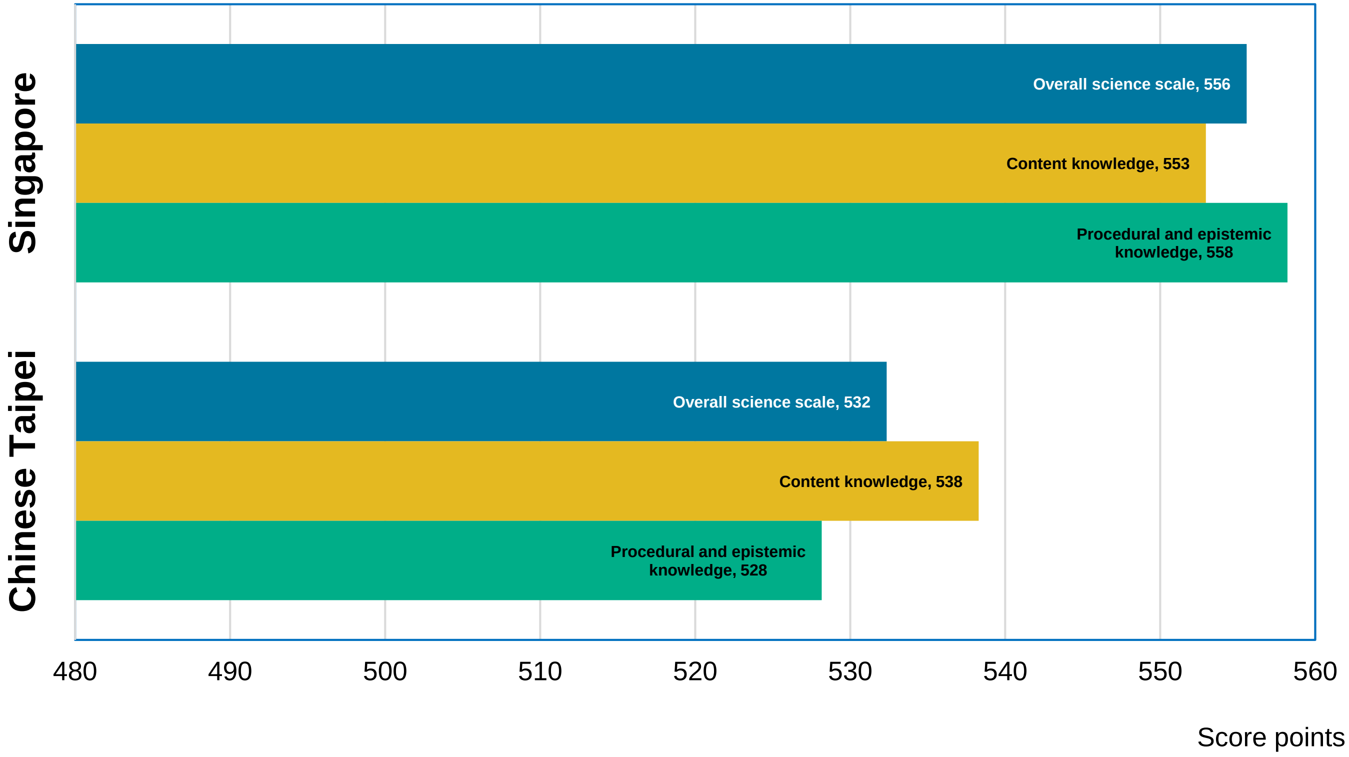

Comparing countries and economies on the different science knowledge subscales

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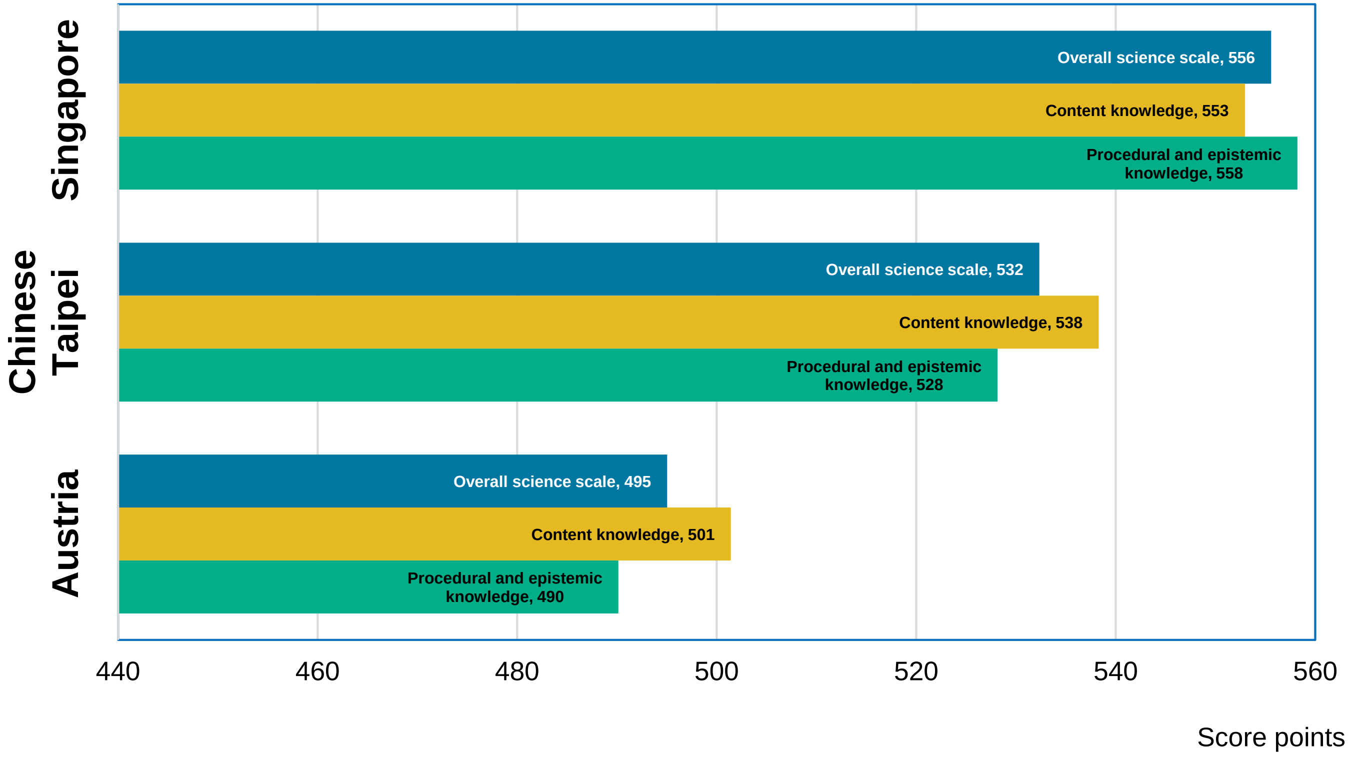

Gender

The difference is not how good they are at science
but in their attitudes to science

Boys' and girls' strengths and weaknesses in science

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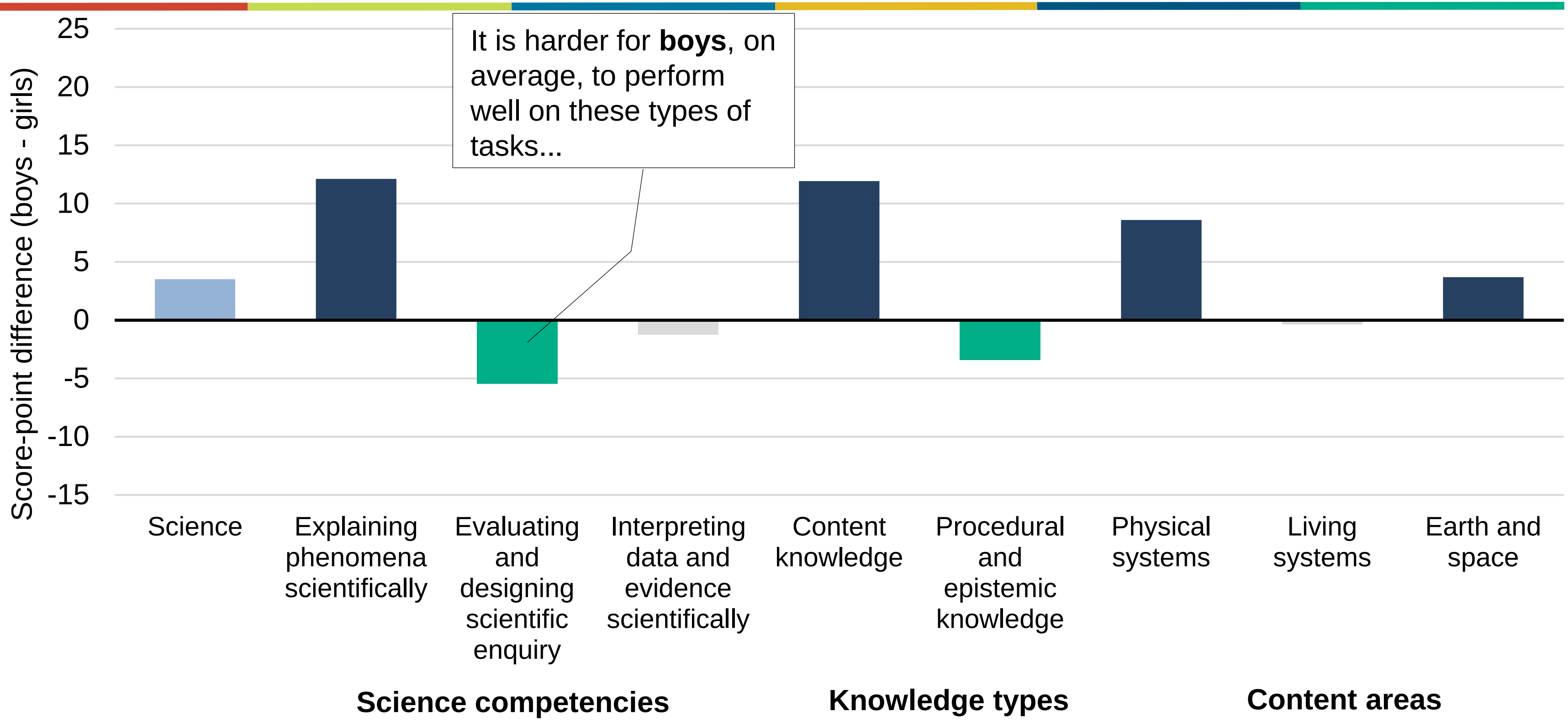

Top-performing boys' and girls' strengths and weaknesses

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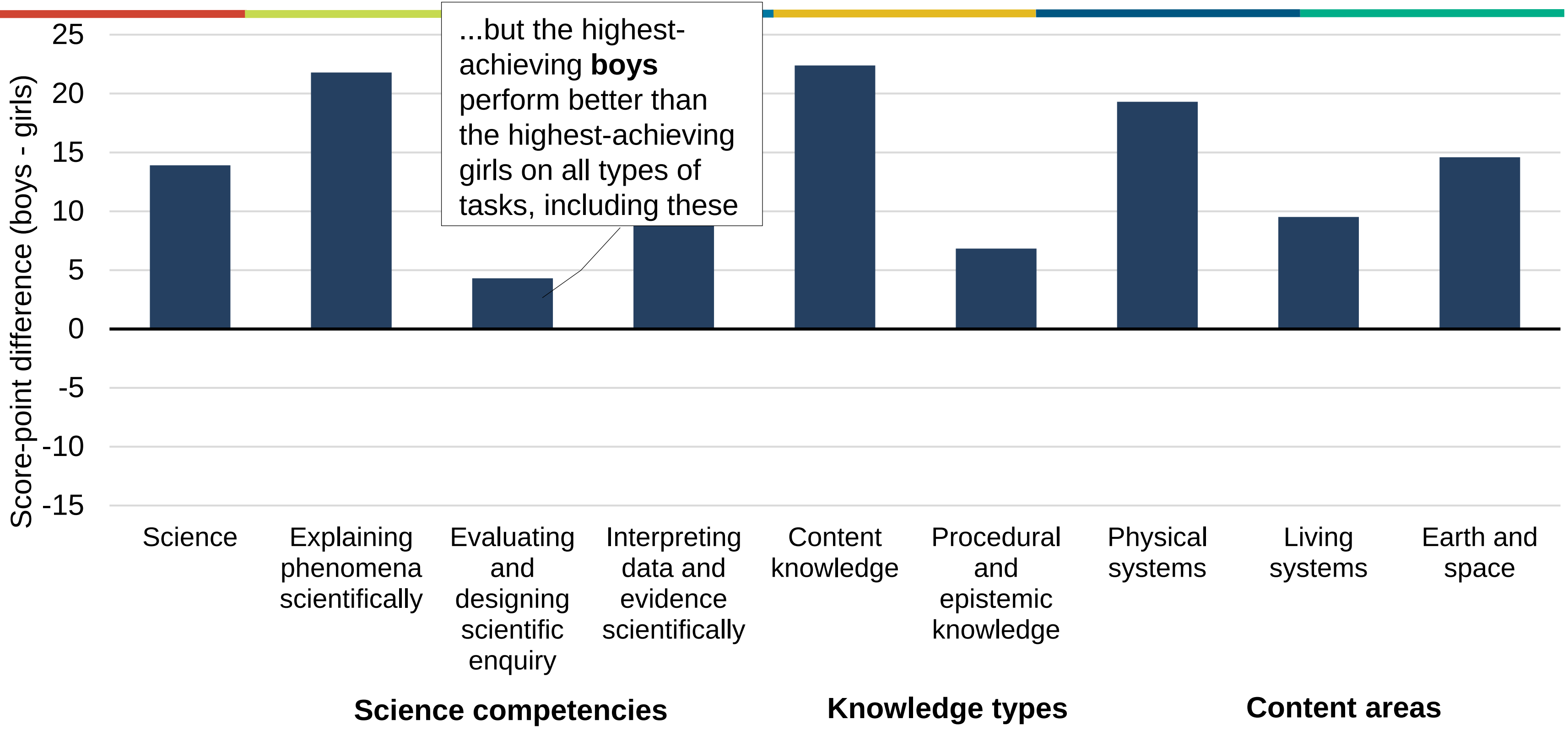

Bottom-performing boys' and girls' strengths and weaknesses

Figure I.2.29