

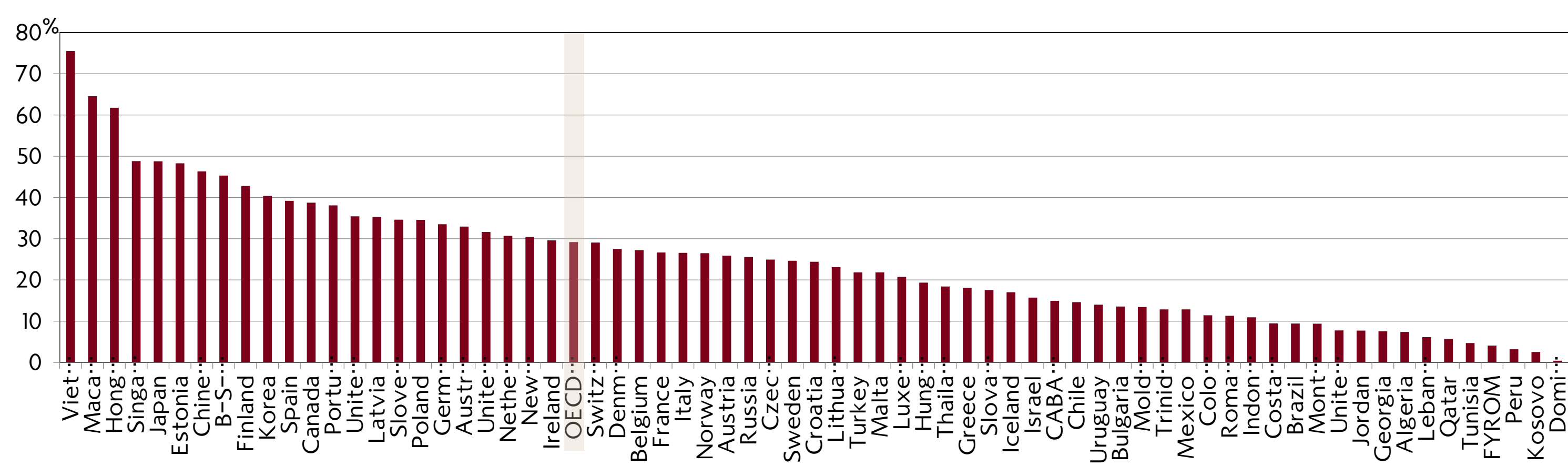
Introduction

Who are academically resilient students?

At present, students struggle to achieve basic skills for their future life, especially students who face challenging socio-economic backgrounds.

There are some students who succeed in school despite encountering adverse circumstance.

(OECD, 2011)



Source: OECD, PISA 2015 Database.

- Using PISA data, OECD has periodically reported international comparisons of the percentage of resilient students.

Research question

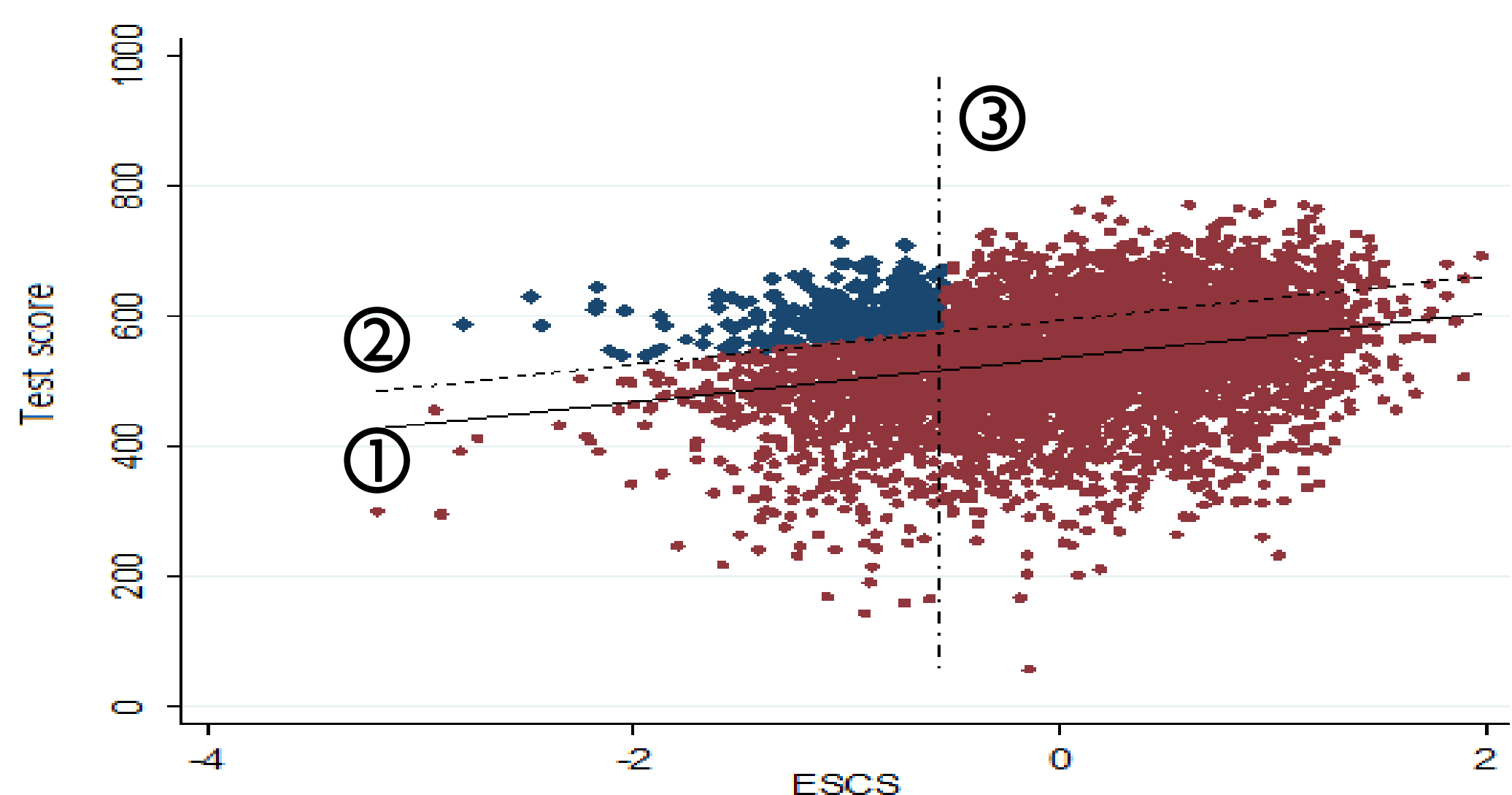
- Is it reasonable to compare the shares of academically resilient students across countries?
- If not, what is the meaning of the academically resilient student concept?

Data and Method

Data

- Data: PISA 2009; 2018
- Population: Students from OECD member countries

How did the OECD define students who are academically resilient?



- Regress test score on PISA index of ESCS and save residuals. (in OECD report: "... after accounting for socio-economic status ...")
- Set the top quartile of residual values as a threshold. (in OECD report: "... performs in the top quarter of residual scores among students ...")
- Define under the bottom quartile of PISA index of economic, social and cultural status (ESCS) as the adverse circumstance. (in OECD report: "... in the bottom quarter of the PISA index ESCS ...")

In the figure above, individuals marked with blue dots can be defined as academically resilient students.

Step	International perspective	Within-country perspective
①	Using data from all countries	
②	Across all countries	within each country
③	within each country	

- In step ②, there are differences in analytical methods between an international perspective and a within-country perspective.

Analysis

- The OECD(2011) suggests that "the cross-country comparable definition gives a hint on how successful different systems are in helping disadvantaged students performing at the top..."

Is it true?

Percentage of resilient students

	International			Within-country		
	2009	2018	Diff %	2009	2018	Diff %
Some countries with a significant decrease in 2018 compared to 2009						
Korea	50.2	33.0	-17.2	26.6	25.6	-1.0
Finland	40.2	32.2	-8.0	27.8	25.8	-2.0
Japan	37.8	27.9	-9.9	24.5	22.8	-1.7
Some countries with a significant increase in 2018 compared to 2009						
United Kingdom	20.1	29.0	+8.9	24.2	27.3	+3.1
Germany	20.6	29.1	+8.5	22.6	24.4	+1.8
United States	24.7	30.4	+5.7	26.0	26.0	0.0

- The direction of change is the same as the result of an international and a within-country perspectives, however, there is significant differences in the size of that.

Findings

- The reason is that the percentages from an international perspective contain various information as shown in the table below.

% of international perspective	Fixed effects		Between effects	
	coef.	s.e.	coef.	s.e.
% of within-country perspective	0.172	0.168	0.915***	0.196
Slope of the gradient	-0.471***	0.059	-0.179*	0.086
Height of the gradient	0.351***	0.023	0.343***	0.027
Model information				
R ²	0.899		0.839	
Hausman test	11.66***			

Notes: 1) p***<0.001, p**<0.01, p*<0.05

- Height of the gradient: Predicted performance for a student with a socio-economic background equal to zero.
- Slope of the gradient: Score point difference associated with one unit increase in the PISA index of ESCS.

Concluding remarks

- Contrary to the OECD's suggestion, results from an international comparison are not useful in finding systems that are particularly helpful to disadvantaged students.
- Rather, it is related to education systems that help improve achievement on average, or with small educational gaps due to socio-economic backgrounds.
- Therefore, rather than using it for international comparison, the 'resilient student' concept could be used to investigate differences in academic achievement impact factors among resilient students, disadvantaged low achievers, and non-disadvantaged students (Sandoval-Hernández and Białowolski, 2016).

References

- OECD(2011). *Against the odds: Disadvantaged students who succeed in school*. Paris: OECD publishing.
- Sandoval-Hernández, A. and P. Białowolski(2016). Factors and conditions promoting academic resilience: a TIMSS-based analysis of five Asian education systems. *Asia Pacific Education Review*, 17(3), 511-520.