Policy Implications

While all countries participating in PISA 2009 show a relationship between home background and educational outcomes, some countries show that high levels of performance and equity of educational opportunities can be jointly achieved. What can explain these positive outcomes? This chapter discusses policies that target low-performing students or schools, target socio-economically disadvantaged students or schools, and more universally aim to raise educational standards for all students.

PATTERNS IN THE RELATIONSHIP BETWEEN PERFORMANCE AND SOCIO-ECONOMIC BACKGROUND

Home background influences educational success, and schooling often appears to reinforce its effects. Although poor performance in school does not automatically stem from a disadvantaged socio-economic background, the socio-economic background of students and schools does appear to have a powerful influence on learning outcomes.

There are thus considerable obstacles for policies aimed at providing equal learning opportunities for all students, regardless of their socio-economic background. National evidence from countries tends to paint a discouraging picture. In general, schools appear to have had little success in "levelling the playing field" for students. Indeed, either because privileged families are better able to reinforce and enhance the effect of schools, because students from privileged families attend higher-quality schools, or because schools are simply better equipped to nurture and develop young people from privileged backgrounds, it often appears that schools reproduce existing patterns of privilege, rather than create a more equitable distribution of opportunities and outcomes.

The internationally comparable results that emerge from this volume paint a more encouraging picture, with large differences between countries in the extent to which socio-economic background influences learning outcomes, which suggests that high levels of equity are an achievable goal.

With the exception of Israel, Slovenia, Turkey and the United States, where socio-economically disadvantaged schools also tend to be deprived of basic resources, such as favourable student-staff ratios, OECD countries try to place at least an equal, if not a larger, number of teachers in socio-economically disadvantaged schools as they do in advantaged schools. This being said, disadvantaged schools still report great difficulties in attracting qualified teachers. In other words, in disadvantaged schools, a high quantity of resources does not necessarily translate into a high quality of resources. This finding suggests that many students face the double liability of coming from a disadvantaged background and attending a school with lower-quality resources. Many countries also show a strong relationship between the socio-economic background of students and their success at school. In some of these countries, these disparities are magnified by large variations in the schools' socio-economic background – that is, in the backgrounds of the students' peers.

However, many students, many schools, and some countries perform better than expected given their socio-economic backgrounds. Korea, Finland, Canada and Japan, as well as the partner economies Hong Kong-China and Shanghai-China, show high mean performance and a low or, at most, moderate relationship between socio-economic background and student performance (whether measured by the slope or the strength of the socio-economic gradient). These countries combine high average performance with equity and have a large proportion of top-performing students, which demonstrates that excellence and equity can go together.

■ Figure II.B [Part 1/2] ■

Summary of students' and schools' socio-economic background and performance

	Mean performance score in reading	Percentage of students below proficiency level[2] in reading	Average PISA index of economic, social and cultural status (ESCS) (Mean index)	Overall strength of the relationship between student performance and the ESCS[1] Percentage of explained variance in student performance	Overall slope of the socio-economic gradient[1,2] Score point difference associated with one unit on the ESCS	Within-school effects of ESCS Student-level score point difference associated with one unit of the student-level ESCS	Explained within-school variance
OECD							
Australia	515	14.2	0.34	12.7	**46**	30	6.1
Austria	470	27.6	0.06	16.6	**48**	10	2.3
Belgium	506	17.7	0.20	**19.3**	**47**	13	3.4
Canada	524	10.3	0.50	**8.6**	**32**	21	4.3
Chile	449	30.6	-0.57	**18.7**	**31**	8	1.1
Czech Republic	478	23.1	-0.09	12.4	**46**	14	1.4
Denmark	495	15.2	0.30	14.5	**36**	28	9.7
Estonia	501	13.3	0.15	**7.6**	**29**	16	2.3
Finland	536	8.1	0.37	**7.8**	**31**	28	6.8
France	496	19.8	-0.13	16.7	**51**	w	w
Germany	497	18.5	0.18	**17.9**	**44**	10	0.1
Greece	483	21.3	-0.02	12.5	34	14	2.6
Hungary	494	17.6	-0.20	**26.0**	**48**	7	0.5
Iceland	500	16.8	0.72	**6.2**	27	24	5.8
Ireland	496	17.2	0.05	12.6	39	27	5.2
Israel	474	26.5	-0.02	12.5	**43**	18	5.8
Italy	486	21.0	-0.12	**11.8**	**32**	5	0.7
Japan	520	13.6	-0.01	**8.6**	40	5	1.1
Korea	539	5.8	-0.15	**11.0**	**32**	20	3.6
Luxembourg	472	26.0	0.19	**18.0**	40	21	5.2
Mexico	425	40.1	-1.22	14.5	**25**	3	0.0
Netherlands	508	14.3	0.27	12.8	37	5	2.2
New Zealand	521	14.3	0.09	**16.6**	**52**	36	9.7
Norway	503	15.0	0.47	**8.6**	36	28	6.1
Poland	500	15.0	-0.28	14.8	39	31	9.9
Portugal	489	17.6	-0.32	16.5	**30**	17	5.9
Slovak Republic	477	22.2	-0.09	14.6	41	17	3.4
Slovenia	483	21.2	0.07	14.3	39	2	1.7
Spain	481	19.6	-0.31	13.6	**29**	21	7.2
Sweden	497	17.4	0.33	13.4	**43**	34	11.1
Switzerland	501	16.8	0.08	14.1	40	20	4.6
Turkey	464	24.5	-1.16	**19.0**	**29**	8	2.2
United Kingdom	494	18.4	0.20	13.7	**44**	27	6.0
United States	500	17.6	0.17	16.8	42	23	3.8
OECD average	493	18.8	0.00	14.0	38	18	4.3
Partners							
Albania	385	56.7	-0.95	10.7	**31**	13	2.8
Argentina	398	51.6	-0.62	**19.6**	40	9	0.9
Azerbaijan	362	72.8	-0.64	**7.4**	**21**	8	1.3
Brazil	412	49.6	-1.16	13.0	28	3	-0.2
Bulgaria	429	41.0	-0.11	**20.2**	**51**	11	3.1
Colombia	413	47.1	-1.15	16.6	**28**	9	1.1
Croatia	476	22.4	-0.18	**11.0**	**32**	10	1.3
Dubai (UAE)	459	31.0	0.42	14.2	**51**	19	4.0
Hong Kong-China	533	8.3	-0.80	**4.5**	**17**	3	0.4
Indonesia	402	53.4	-1.55	**7.8**	**17**	1	0.1
Jordan	405	48.0	-0.57	**7.9**	24	18	6.7
Kazakhstan	390	58.7	-0.51	12.0	38	19	3.6
Kyrgyzstan	314	83.2	-0.65	14.6	40	16	3.5
Latvia	484	17.6	-0.13	**10.3**	**29**	19	3.6
Liechtenstein	499	15.7	0.09	8.4	**26**	3	2.1
Lithuania	468	24.4	-0.05	13.6	**33**	16	4.0
Macao-China	487	14.9	-0.70	**1.8**	**12**	6	0.3
Montenegro	408	49.5	-0.24	**10.0**	**31**	11	2.0
Panama	371	65.3	-0.81	18.1	31	3	1.0
Peru	370	64.8	-1.31	**27.4**	41	8	1.2
Qatar	372	63.5	0.51	**4.0**	**25**	7	1.6
Romania	424	40.4	-0.34	13.6	36	10	2.5
Russian Federation	459	27.4	-0.21	**11.3**	37	21	3.3
Serbia	442	32.8	0.07	**9.8**	**27**	6	0.8
Shanghai-China	556	4.1	-0.49	12.3	**27**	4	0.1
Singapore	526	12.5	-0.43	15.3	**47**	26	6.4
Chinese Taipei	495	15.6	-0.33	11.8	36	21	5.6
Thailand	421	42.9	-1.31	13.3	**22**	2	0.2
Trinidad and Tobago	416	44.8	-0.58	**9.7**	38	2	2.2
Tunisia	404	50.2	-1.20	**8.1**	**19**	2	-0.2
Uruguay	426	41.9	-0.70	**20.7**	37	15	3.3

1. Values that are statistically significantly different from the OECD average are indicated in bold.
2. Single-level bivariate regression of reading performance on the ESCS, the slope is the regression coefficient for the ESCS.
3. The index of academic inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of performance, *i.e.* the variance in student performance between schools, divided by the sum of the variance in student performance between schools and the variance in student performance within schools.
4. The index of social inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of socio-economic background, *i.e.* the variance in the PISA index of social, economic and cultural status of students between schools, divided by the sum of the variance in students' socio-economic background between schools and the variance in students' socio-economic background within schools.
Source: OECD, *PISA 2009 Database.* Tables II.2.1, II.3.1, II.3.2, II.5.1 and II.5.2.
StatLink http://dx.doi.org/10.1787/888932343646

■ Figure II.B [Part 2/2] ■

Summary of students' and schools' socio-economic background and performance

	Student variability in the distribution of ESCS	Between-school effects of ESCS		School variability in the distribution of ESCS	Academic inclusion index[3]	Social inclusion index[4]
	Interquartile range of the distribution of the student-level ESCS	School-level score point difference associated with one unit on the school mean ESCS	Explained between-school variance	Interquartile range of the distribution of school mean distribution of ESCS		
OECD						
Australia	1.09	66	67.6	0.55	73.9	76.4
Austria	1.08	80	50.9	0.61	44.4	69.2
Belgium	1.38	111	65.5	0.82	47.5	69.8
Canada	1.17	32	44.2	0.50	78.3	82.4
Chile	1.64	50	69.0	1.06	45.0	48.6
Czech Republic	0.96	123	66.5	0.45	51.0	75.1
Denmark	1.25	42	69.1	0.55	84.1	83.6
Estonia	1.22	41	45.6	0.50	78.2	81.5
Finland	1.14	19	23.2	0.43	91.3	89.2
France	1.15	w	w	w	w	w
Germany	1.20	122	67.2	0.71	39.8	76.0
Greece	1.48	44	39.8	0.66	53.9	68.0
Hungary	1.34	76	65.0	0.85	33.3	54.2
Iceland	1.31	11	23.6	0.55	85.9	82.8
Ireland	1.21	53	58.5	0.50	71.3	76.7
Israel	1.19	102	42.9	0.68	51.4	76.7
Italy	1.41	67	43.5	0.85	37.9	73.9
Japan	1.08	137	51.9	0.58	51.4	78.2
Korea	1.16	62	53.2	0.58	65.8	74.1
Luxembourg	1.53	65	82.0	0.82	56.4	73.3
Mexico	2.00	30	36.7	1.15	51.9	56.2
Netherlands	1.24	93	45.2	0.50	35.4	76.2
New Zealand	1.09	61	72.1	0.56	75.8	78.9
Norway	1.02	31	26.6	0.31	89.7	91.2
Poland	1.12	29	65.4	0.54	81.2	73.3
Portugal	1.69	40	58.9	0.80	66.9	73.2
Slovak Republic	1.05	72	56.2	0.58	60.4	76.6
Slovenia	1.36	77	41.8	0.70	42.8	75.0
Spain	1.64	25	48.4	0.78	78.2	77.1
Sweden	1.14	52	67.9	0.42	81.5	85.7
Switzerland	1.24	66	48.6	0.58	67.4	85.4
Turkey	1.78	60	68.5	0.94	33.2	63.5
United Kingdom	1.11	69	77.1	0.53	70.7	81.6
United States	1.31	63	75.7	0.73	64.0	70.7
OECD average	1.29	63	55.1	0.65	61.4	74.8
Partners						
Albania	1.45	39	54.0	0.75	69.4	67.7
Argentina	1.74	69	59.1	1.14	39.5	59.8
Azerbaijan	1.48	25	13.2	0.88	58.2	72.0
Brazil	1.80	53	54.2	0.88	51.6	64.7
Bulgaria	1.38	81	65.2	0.72	50.1	57.9
Colombia	1.91	41	76.7	1.14	60.4	60.2
Croatia	1.18	69	49.4	0.57	52.5	77.2
Dubai (UAE)	0.89	80	34.5	0.77	48.7	62.4
Hong Kong-China	1.39	33	19.4	0.65	58.1	69.9
Indonesia	1.62	25	20.8	1.06	56.8	61.3
Jordan	1.54	18	21.2	0.59	62.2	76.4
Kazakhstan	1.20	50	37.4	0.55	63.8	71.7
Kyrgyzstan	1.39	62	51.2	0.65	64.4	72.0
Latvia	1.38	30	50.6	0.61	78.9	75.4
Liechtenstein	1.38	121	68.3	0.84	54.0	88.2
Lithuania	1.58	43	48.2	0.67	73.6	73.7
Macao-China	1.15	19	35.3	0.53	59.2	65.2
Montenegro	1.34	67	70.4	0.72	63.9	77.2
Panama	2.07	57	48.7	1.23	41.5	57.7
Peru	1.77	59	72.9	1.17	44.0	50.7
Qatar	1.11	80	17.0	0.65	46.9	70.6
Romania	1.12	40	37.4	0.64	48.6	65.3
Russian Federation	1.25	38	41.5	0.57	74.8	71.5
Serbia	1.35	53	50.5	0.58	51.3	76.6
Shanghai-China	1.61	58	69.0	0.90	61.6	66.3
Singapore	1.12	86	60.3	0.46	64.7	81.7
Chinese Taipei	1.12	52	50.8	0.55	67.7	80.1
Thailand	1.85	18	23.3	1.23	71.3	48.9
Trinidad and Tobago	1.21	145	58.7	0.66	38.2	77.3
Tunisia	2.01	26	18.7	0.96	58.6	67.2
Uruguay	1.84	48	74.7	0.93	54.8	59.8

1. Values that are statistically significantly different from the OECD average are indicated in bold.
2. Single-level bivariate regression of reading performance on the ESCS, the slope is the regression coefficient for the ESCS.
3. The index of academic inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of performance, *i.e.* the variance in student performance between schools, divided by the sum of the variance in student performance between schools and the variance in student performance within schools.
4. The index of social inclusion is calculated as 100*(1-rho), where rho stands for the intra-class correlation of socio-economic background, *i.e.* the variance in the PISA index of social, economic and cultural status of students between schools, divided by the sum of the variance in students' socio-economic background between schools and the variance in students' socio-economic background within schools.
Source: OECD, *PISA 2009 Database*. Tables II.2.1, II.3.1, II.3.2, II.5.1 and II.5.2.
StatLink ⃞⊠⊒ http://dx.doi.org/10.1787/888932343646

What are useful strategies for moderating the impact of social background so that all students can realise their potential? The relationships between background and performance described in this volume are manifested in very different patterns across different countries. Thus, strategies for improvement need to be tailored accordingly. Figure II.B shows the key characteristics of the relationship between students' and schools' socio-economic background and performance across education systems.

For each country, Figures II.C to II.O show the average performance and the socio-economic composition of the student population for each school in the PISA sample. As elsewhere in this volume, the socio-economic composition of a school is measured by the mean *PISA index of economic, social and cultural status* of the students attending this school. Each dot in Figures II.C-II.O represents one school, with the size of the dot proportionate to the number of 15-year-olds enrolled in that school. The patterns show how strongly students are segregated along socio-economic lines, whether because of residential segregation, economic factors or selection within the school system. The figures also display the gradient line between socio-economic background and student performance (black line in Figures II.C-II.O). Finally, the figures present the between-school gradient line (grey line in Figures II.C-II.O) and the average within-school gradient line (blue line in Figures II.C-II.O). Schools above the between-school gradient line (grey line) perform better than predicted by their socio-economic intake. Schools below the between-school gradient line perform worse than expected.

The figures summarise the three levels at which the relationship between student background and performance manifests itself. One is how strong the relationship between socio-economic background and learning outcomes is in a given country, as measured by how much of the variation in student performance can be attributed to variation in socio-economic background. The second shows how much of the variation in average performance among schools can be attributed to variation in the average socio-economic background of the schools' intake. The third reflects the relationship within a given school: how much of the variation in student performance within a given school can be attributed to variation in socio-economic background within that particular school. The amount of socio-economic variability and the overall performance differences within a country are also relevant. Analysing these patterns can assist in designing policies to improve equity in educational opportunities (Willms, 2006). Some options, which can be considered in combination, include:

- *Targeting low performance, regardless of students' background, either by targeting low-performing schools or low-performing students within schools, depending on the extent to which low performance is concentrated by school*. Where academic inclusion (Figure II.B) is low, interventions may be targeted at low-performing schools; where academic inclusion is high interventions can be directed at low-performing students in each school. Such policies often tend to provide a specialised curriculum or additional instructional resources for particular students based on their levels of academic performance. For example, some school systems provide early prevention programmes that target children who are deemed to be at risk of failure at school when they enter early childhood programmes or schools, while other systems provide late prevention or recovery programmes for children who fail to progress at a normal rate during the first few years of primary school. Some performance-targeted programmes aim to provide a modified curriculum for high-achieving students, such as programmes for gifted students. More generally, policies that involve tracking or streaming of students into different types of programmes could be considered performance-targeted as they strive to match curriculum and instruction to students' academic ability or performance. Grade repetition is also sometimes considered a performance-targeted policy, because the decision to make a student repeat a grade is usually based on school performance. However, in many cases, grade repetition does not entail a modified curriculum or additional instructional resources. Therefore, it does not fit the definition of a performance-targeted policy used here. The focus of performance-targeted policies tends to be at the lower end of the performance scale, regardless of the students' socio-economic background, and their objective is to bring low-performing students up to par with their peers.

- *Targeting disadvantaged children through a specialised curriculum, additional instructional resources or economic assistance for these students*. A relatively strong social gradient, which accounts for a substantial proportion of performance variation, can indicate the relevance of such policies. Again, policies can be designed either at the school or individual level, depending on the strength of the inter-school social gradient and the extent to which schools are segregated by socio-economic background. An example is the Head Start pre-

school programme in the United States for children from socio-economically disadvantaged backgrounds. Some approaches select students on the basis of a risk factor other than socio-economic background, such as whether the students are recent immigrants, members of an ethnic minority, or living in a low-income community. The important distinction is that these programmes select students based on the families's socio-economic backgrounds rather than on the students' cognitive ability.

- ***While policies targeted at disadvantaged children can aim at their performance in school, they can also be used to provide additional economic resources to these students***. The emphasis here is on improving the economic circumstances of students from poor families, rather than offering specialised curricula or additional educational resources. Providing free transportation and free lunch programmes for students from poor families is an example. More generally, and in many countries, providing transfer payments to poor families is one of the primary policy levers at the national level. The distinction between these kinds of compensatory policies and socio-economically targeted policies is not always clear-cut. For example, some jurisdictions have compensatory funding formulas that allocate educational funds to schools based on their socio-economic intake. In some sense this is a compensatory policy, but it could also be considered a socio-economically targeted policy since the intention is to provide additional educational resources to students from disadvantaged backgrounds.

- ***More universal policies rely mainly on raising standards for all students***. These types of policies are likely to be most relevant in countries with weaker gradients and less variation in student performance. They can involve altering the content and pace of the curriculum, improving instructional techniques, introducing full-day schooling, changing the age of entry into school, or increasing the time spent in language classes. Some jurisdictions responded to PISA 2000 results by introducing major school and curricular reforms that included some of these changes. There have been also efforts to increase parents' involvement in schooling in several ways, including greater involvement at home and greater participation in school governance. Many universal policies are directed at changing teacher practices or they aim to increase the accountability of schools and school systems by assessing student performance.

- ***Inclusive policies strive to include marginalised students into mainstream schools and classrooms***. Inclusive practices often concentrate on including students with disabilities in regular classrooms, rather than segregating them in special classes or schools. This volume considers inclusive policies as those that aim to include any type of student who may be segregated, whether because of his/her disabilities or ethnic or socio-economic background. Some inclusive policies try to reduce between-school socio-economic segregation by redrawing school catchment boundaries, amalgamating schools, or by creating magnet schools in low-income areas.

The following examples illustrate a range of different patterns observed in the PISA 2009 reading data that point to the relevance of such policy options.

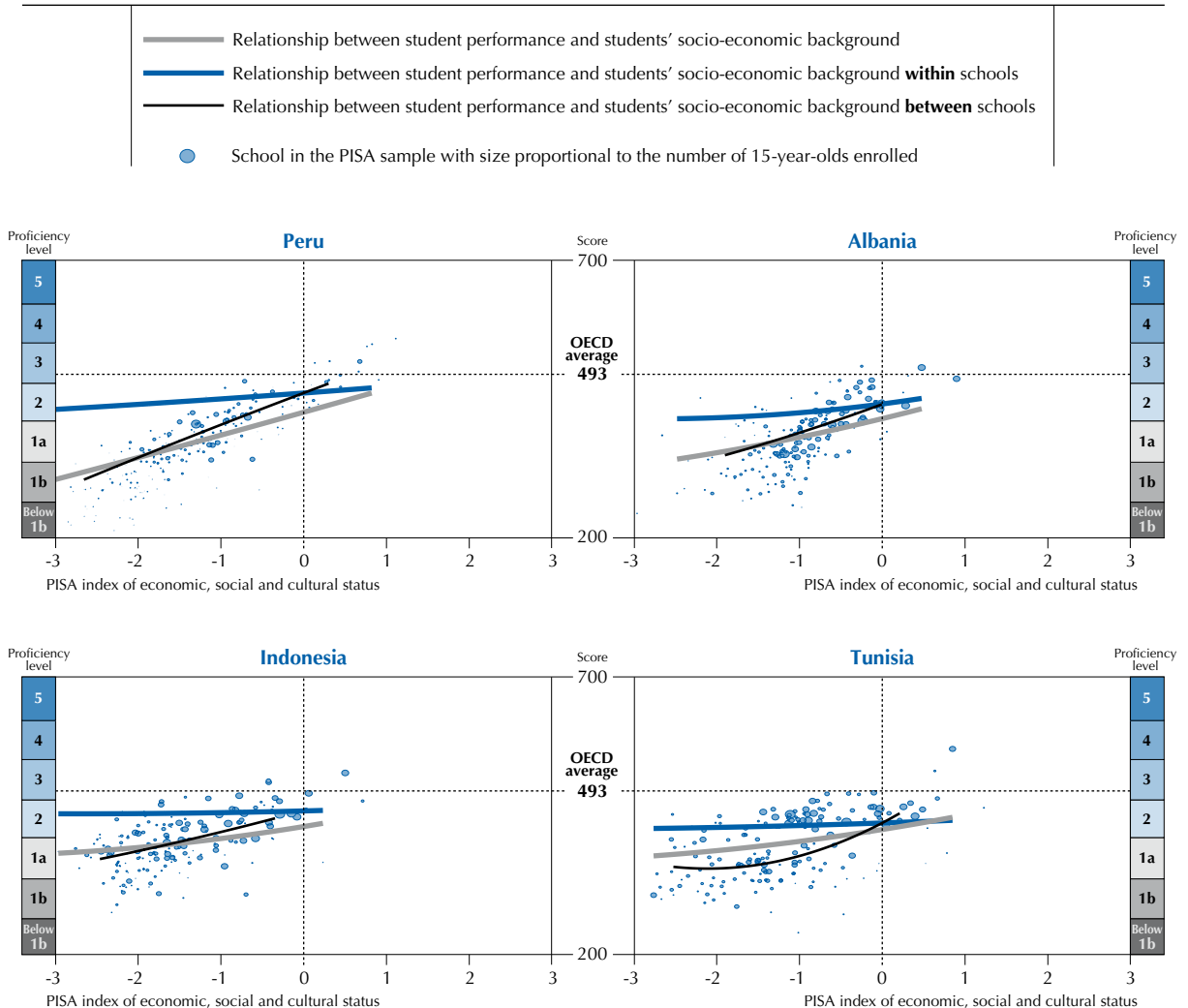## A DISPROPORTIONATE NUMBER OF LOW-PERFORMING STUDENTS

As shown in Chapter 2, in some countries, most students are relatively weak in reading. In others, there are relatively large numbers with low proficiency in reading, even though substantial numbers also demonstrate high proficiency. In the partner countries Kyrgyzstan, Azerbaijan, Panama, Peru, Qatar, Kazakhstan, Albania, Indonesia, Argentina, Tunisia, Brazil, Montenegro, Jordan, Colombia, Trinidad and Tobago, Thailand, Uruguay, Romania, Bulgaria, and the OECD country Mexico, the absolute number of poorly-performing students is high, with 40% or more of 15-year-olds performing below Level 2 (Figure II.B). These countries are characterised by students' very low average performance and extremely disadvantaged backgrounds, both when compared to the average background and length of the socio-economic gradient, and particularly when compared to countries that show relatively high levels of excellence and equity in PISA. The slope of the gradient and the proportion of the variance explained often tend to be small. In some of these countries, this can be explained by the limited proportion of 15-year-olds who are enrolled in school and who represent a more homogeneous student group than the entire group of 15-year-olds; in other countries, it can be explained by the fact that the PISA measures of socio-economic background often do not discriminate sufficiently among very poor performing students.

Among these countries, the performance variation between schools is high, but within-school variation is around the average. Social and academic inclusion is low, particularly when compared with countries that show high levels

of performance and equity. Some countries in this group, like Brazil or Mexico, have successfully experimented with compensatory interventions. However, the fairly small proportion of student performance variation that is explained by socio-economic background suggests that poor performance deserves as much attention as poverty. Figure II.C contrasts the profiles of some of these countries.

■ Figure II.C ■

Relationship between school performance and schools' socio-economic background in Peru, Albania, Indonesia and Tunisia

──────── Relationship between student performance and students' socio-economic background

──────── Relationship between student performance and students' socio-economic background **within** schools

──────── Relationship between student performance and students' socio-economic background **between** schools

● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database.*
StatLink ⌬⌐ http://dx.doi.org/10.1787/888932343646

In another group of countries, the proportion of poor performers is moderate in absolute terms, but the gap between poor performers and other students is large. For example, as shown in Figure II.D, Luxembourg, Israel, Austria and the partner country Dubai (UAE) show between 5% and 8% of students performing at Level 5 or 6 in reading, roughly the OECD average, but more than one-quarter performing below Level 2. These are countries with average socio-economic backgrounds, both in terms of the mean and how socio-economic advantage is distributed, but with mean performance below the OECD average. They are characterised by steep socio-economic gradients and average levels of socio-economic inclusion, particularly between schools.

Such patterns suggest that targeted interventions based on socio-economic background can prove successful, often in combination with performance-targeted interventions, such as additional support for students who struggle with reading, particularly in those systems that show low academic inclusion.

■ Figure II.D ■

Relationship between school performance and schools' socio-economic background in Luxembourg, Israel, Austria and Dubai (UAE)

—— Relationship between student performance and students' socio-economic background

—— Relationship between student performance and students' socio-economic background **within** schools

—— Relationship between student performance and students' socio-economic background **between** schools

● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink ᴬᵐˢᴸ http://dx.doi.org/10.1787/888932343646

Other countries that show a comparatively large gap between better and poorer performing students include the United States and Belgium (Figure II.E), where at least 10% of students score at Level 5 or 6 but between 17% and 20% of students score below Level 2. This group of countries has mean performance and socio-economic backgrounds slightly above the OECD average. However, the socio-economic gradients are steep and socio-economic background explains a large part of the observed performance variation between schools. These countries also show lower levels of social inclusion. With steep gradients and low levels of inclusion, interventions that target both performance and socio-economic background can assist low-performing students from disadvantaged backgrounds.

■ Figure II.E ■
Relationship between school performance and schools' socio-economic background in United States and Belgium

▬▬▬	Relationship between student performance and students' socio-economic background
▬▬▬	Relationship between student performance and students' socio-economic background **within** schools
▬▬▬	Relationship between student performance and students' socio-economic background **between** schools
●	School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database.*
StatLink 📊 http://dx.doi.org/10.1787/888932343646

DIFFERENT SLOPES AND STRENGTHS OF SOCIO-ECONOMIC GRADIENTS

School administrators often wonder whether efforts to improve student performance should be targeted mainly at those students who perform poorly or those from socio-economically disadvantaged backgrounds. The overall slope of the socio-economic gradient, together with the proportion of performance variation as explained by socio-economic background, are useful indicators for answering this question. As noted above, there is an important distinction between the slope of the social gradient, which refers to the average size of the performance gap associated with a given difference in socio-economic status, and its strength, which is associated with how closely students conform to the predictions of the gradient line.

In countries with relatively shallow gradients, *i.e.* where predicted student performance tends to be similar across socio-economic groups, policies that specifically target students from disadvantaged backgrounds would not, by themselves, address the needs of many of the country's low-performing students.

Gentle slopes and weak-versus-strong gradients

Among the high-performing countries and economies, Shanghai-China, Korea, Finland, Hong Kong-China and Canada all show gentle slopes of the socio-economic gradients, suggesting that even large differences in the socio-economic backgrounds of students are, on average, not associated with large performance differences among students. Among countries and economies in which students perform slightly below or around the OECD average, the same is true for Estonia, Iceland, Portugal, Italy, Spain and the partner countries and economies Liechtenstein, Macao-China and Latvia.

In these countries, a relatively smaller proportion of low-performing students come from disadvantaged backgrounds, and the relationship between school performance and schools' socio-economic intake is weaker. Thus, by themselves, policies that specifically target students from disadvantaged backgrounds would not address the needs of many of the country's lower-performing students. Moreover, if the goal is to ensure that most students achieve some minimum level of performance, socio-economically-targeted policies in these countries would be providing services to a sizeable proportion of students who already perform well.

■ Figure II.F ■

Relationship between school performance and schools' socio-economic background in Shanghai-China, Korea, Finland and Canada
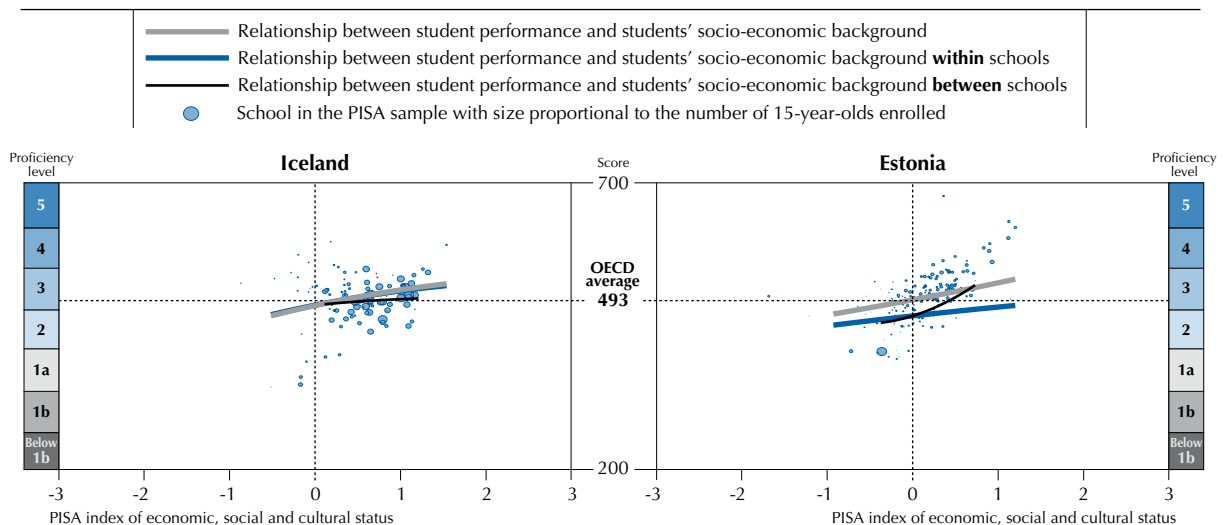
— Relationship between student performance and students' socio-economic background
— Relationship between student performance and students' socio-economic background **within** schools
— Relationship between student performance and students' socio-economic background **between** schools
● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932343646

■ Figure II.G ■

Relationship between school performance and schools' socio-economic background in Iceland and Estonia

— Relationship between student performance and students' socio-economic background
— Relationship between student performance and students' socio-economic background **within** schools
— Relationship between student performance and students' socio-economic background **between** schools
● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932343646

Steep slopes and weak-versus-strong gradients

Among the high-performing countries, New Zealand and Australia as well as the partner country Singapore show a steep relationship between socio-economic background and student performance, suggesting that two students from slightly different backgrounds tend to show large performance differences. Among countries in which students perform around the OECD average, the same holds true for Sweden, Germany, France, the United Kingdom and Hungary. In these countries, socio-economically targeted policies would direct more resources towards students who are likely to require these services. An illustration of this can be observed in the comparison of Finland or Canada, on the one hand, and New Zealand or the partner country Singapore, on the other – all countries with similar levels of overall performance. By focusing on actions indicated in the left area of the chart, for example, socio-economically-targeted policies would exclude many schools and students in Canada that show comparatively low performance but have advantaged backgrounds, as shown in the bottom right area of the graph. In contrast, performance-targeted policies would reach most of the lower-performing students and schools. In the partner country Singapore, where the relationship between socio-economic background and student performance is much steeper, socio-economically-targeted interventions are likely to have a much stronger impact, as a much larger proportion of students and schools are located in the lower-left quadrant of the figure.

Countries where the gradient is steep will find that socio-economically-targeted policies are more likely to reach the students who most need help. Socio-economically targeted interventions are of particular relevance in countries that show steep socio-economic gradients and an above-average strength of the relationship between socio-economic background and learning outcomes. Interestingly, there is no such country among the high-performing countries, but Belgium, Germany and Hungary are examples of such countries with performance around the OECD average.

■ Figure II.H ■

Relationship between school performance and schools' socio-economic background in Australia, New Zealand, Germany and Belgium

—— Relationship between student performance and students' socio-economic background
—— Relationship between student performance and students' socio-economic background **within** schools
—— Relationship between student performance and students' socio-economic background **between** schools
● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database.*
StatLink ⟐ http://dx.doi.org/10.1787/888932343646

In contrast, the case for socio-economically-targeted policies can be overstated for countries with steep socio-economic gradients where the variation explained by socio-economic background is only moderate. In these countries, there tends to be a sizeable group of poorly-performing students from more privileged socio-economic backgrounds. Among the high-performing countries, Australia, New Zealand and partner country Singapore have steep gradients but the strength of the relationship is only around the OECD average.

As the vertical cut-off point in Figure II.H shifts to the left – *i.e.* as the picture focuses on more disadvantaged backgrounds – the proportion of schools and students with low levels of performance that is not covered by these policies increases. In these cases, socio-economically-targeted policies are likely to miss a large proportion of students who perform relatively poorly.

Alternatively, compare France and Germany, which show the same level of reading performance. France has a steeper socio-economic gradient than Germany, but there are more exceptions to this pattern than in Germany, where the link between socio-economic background and student performance is stronger (Figure II.B).

Among the low-performing countries, the partner economy Dubai (UAE) (a country with a steeper-than-average gradient, estimated at 51 score points), Mexico and the partner country Thailand (with much lower estimated gradients, at around 22-25 score points) provide an interesting contrast (Figure II.I). The gradient in Dubai (UAE), Mexico or Thailand has an average strength of 13% to 14%. Thus, whereas students in Mexico or Thailand pay a lower penalty than those in Dubai (UAE), on average, for coming from a disadvantaged background, because of the less-steep gradients, Mexico and Thailand may find it more feasible to narrow this gap by targeting disadvantaged students.

■ Figure II.I ■
Relationship between school performance and schools' socio-economic background in Dubai (UAE), Mexico and Thailand

Source: OECD, *PISA 2009 Database*.
StatLink ⟨⟩ http://dx.doi.org/10.1787/888932343646
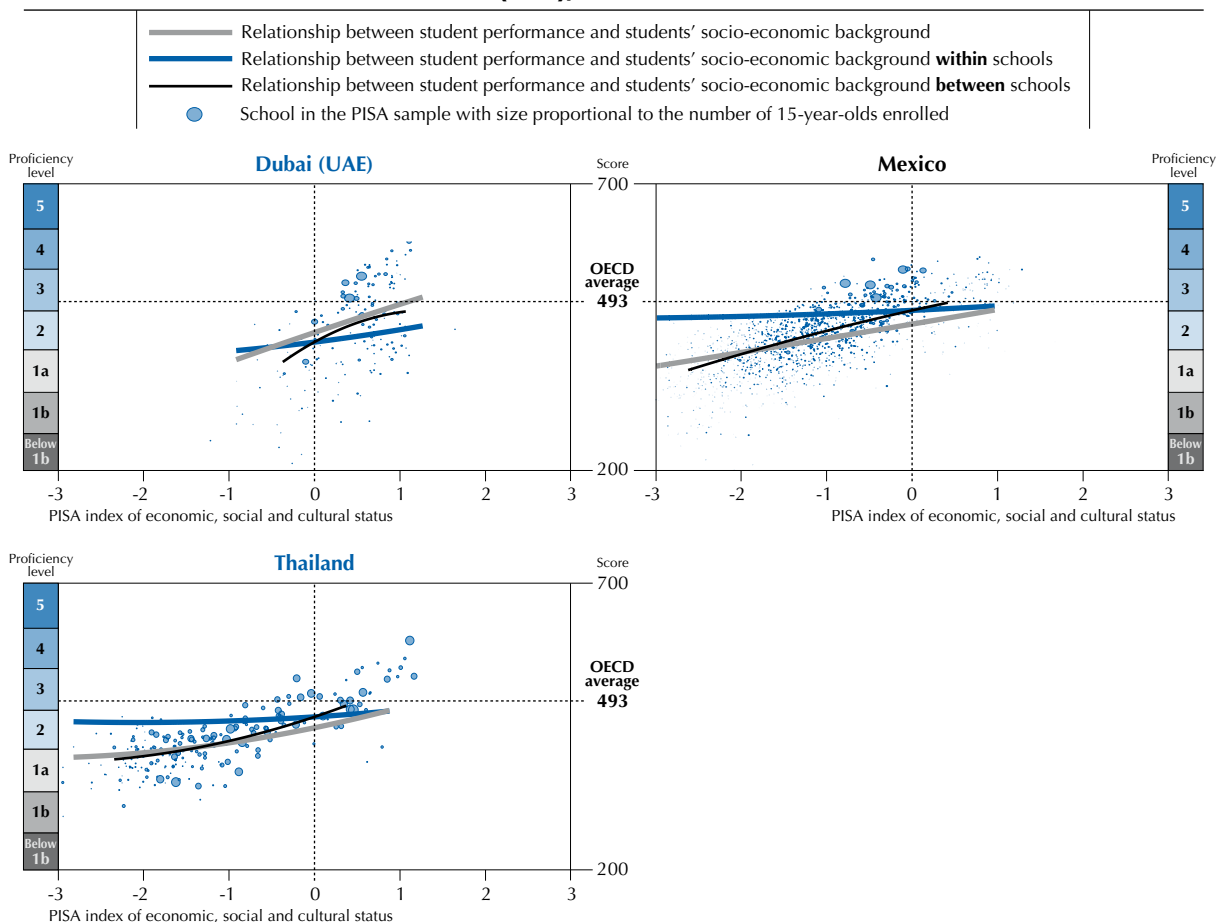
DIFFERENT SOCIO-ECONOMIC PROFILES

It is equally important to understand the degree of socio-economic differences within a country when interpreting the socio-economic gradient. For example, Finland and the partner country Panama have similar socio-economic gradients, but the range of scores on the *PISA index of economic, social and cultural status* (length of the gradient) between the 5th and 95th percentile of students is 4.2 in Panama and 2.5 in Finland (Table II.3.2). In other words, the student population in Panama is far more socio-economically diverse than the student population in Finland. This difference explains why, in Finland, socio-economic background accounts for less-than-average variation in performance, whereas in Panama the performance gap between the bottom and top quarters of the socio-economic distribution is much larger than in Finland (Figure II.J). Among OECD countries, socio-economic diversity, measured in this way, is largest in Mexico, Turkey, Portugal, Chile, Luxembourg and Spain, but many of the partner countries have much greater diversity, including Panama, Peru, Tunisia, Colombia, Uruguay, Brazil, Argentina, and Thailand. In all of these countries, addressing socio-economic diversity is a major challenge and can substantially improve educational performance and equity.

■ Figure II.J ■
Relationship between school performance and schools' socio-economic background in Finland and Panama

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932343646
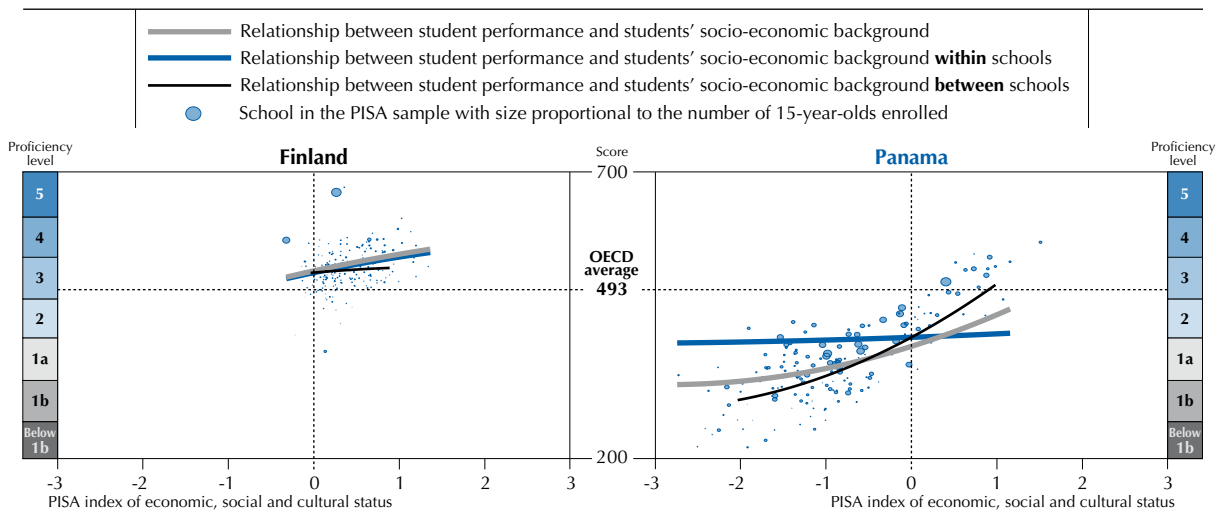
■ Figure II.K ■
Relationship between school performance and schools' socio-economic background in Spain and Mexico

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932343646
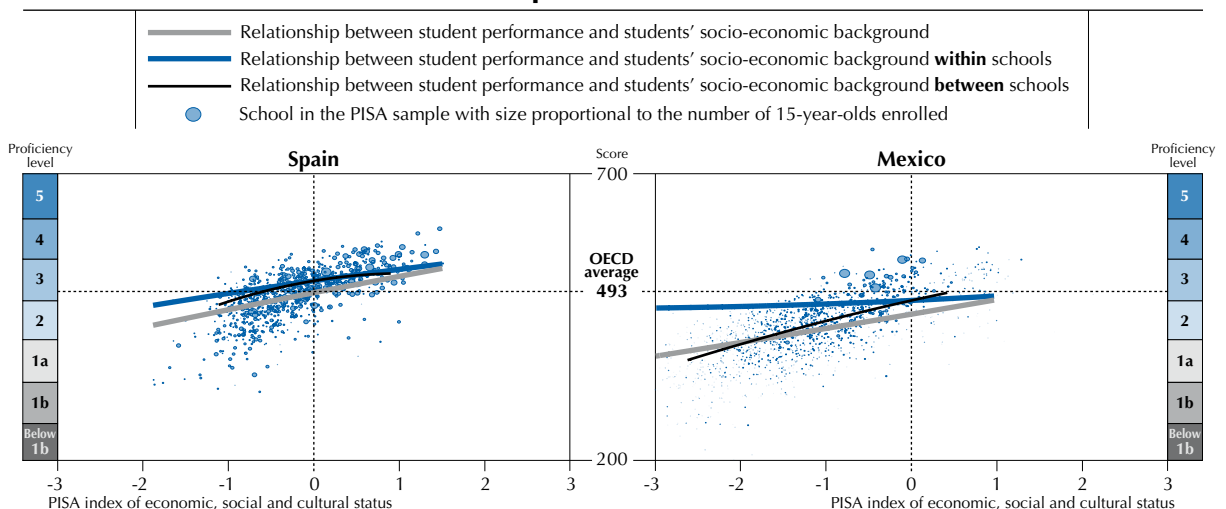
Spain and Mexico offer a similar comparison, although Mexico also has a highly skewed distribution of family background, with a high concentration of socio-economically disadvantaged students. This suggests the need for compensatory policies to help the most disadvantaged students, despite the fact that the slope of the gradient is modest. In Norway or Japan, in contrast, a relatively egalitarian society means that socio-economic differences between students have a relatively small effect on performance, and policies targeting social reform are unlikely to be the most effective way of raising scores.

DIFFERING GRADIENTS ACROSS SCHOOLS

The relationship between a school's socio-economic intake and student performance can vary in several ways. One is the extent to which a student who goes to a school with a more socio-economically advantaged intake can be predicted to perform better in reading. A second is how closely the performance of individual students actually follows this prediction, or the strength of the relationship. Both aspects are most pronounced in the OECD countries Japan, the Czech Republic, Germany, Slovenia, Israel, Belgium, the Netherlands and the partner countries Trinidad and Tobago, Liechtenstein and Singapore (Table II.5.2).

These factors are all important in countries where students' opportunities are strongly affected by differences in schools' intake. In these countries, policies that target socio-economically disadvantaged schools are more likely to succeed in improving performance and equity.

■ Figure II.L ■
Relationship between school performance and schools' socio-economic background in the Czech Republic, Germany, Norway and Poland

— Relationship between student performance and students' socio-economic background
— Relationship between student performance and students' socio-economic background **within** schools
— Relationship between student performance and students' socio-economic background **between** schools
⬤ School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database.*
StatLink ⬛🖩📊 http://dx.doi.org/10.1787/888932343646

This point can be illustrated by comparing countries (Figure II.L): Australia and Luxembourg, with between-school gradients around the OECD average; Germany, the Czech Republic and Japan, with comparatively steep between-school gradients; and Spain, Finland, Poland and Norway, with comparatively shallow between-school gradients. In Germany, more than three-quarters of the difference in student performance across schools is accounted for by socio-economic factors, that is, schools tend to fall into two categories: higher-performing schools with a more privileged socio-economic background, and schools with lower performance levels and a more disadvantaged intake. Most important, the variability in the social intake of schools is great, in that there is a large gap in social background between schools with more and less privileged socio-economic backgrounds. In Japan, in contrast, performance disparities by schools' socio-economic background are comparatively large as well, but the overall differences in the socio-economic profiles of schools are much smaller. That explains why, overall, Japan has one of the more equitable education systems while Germany has one of the more inequitable systems. In countries in which a high level of variation is accounted for by between-school socio-economic factors, policies aimed at reducing social segregation can be a priority, as such social disparities among schools tend to reinforce the inequalities of the system.

A similar contrast can be observed among countries with a comparatively gentle socio-economic gradient. For example, in Greece and Portugal, the slope of the socio-economic gradients is relatively gentle, around 40 score points. The dispersion of schools' socio-economic backgrounds is similar and relatively large, close to an inter-quartile range of 0.75. A school's socio-economic background is a much better predictor of performance in Portugal, where the explained variance is close to 60%, than in Greece, where the explained variance is close to 40%. That is, while many schools in Greece perform differently than what would have been predicted based on their background, in Portugal, socio-economic background is closely associated with a school's performance. Policies that target socio-economically disadvantaged schools are thus more likely to succeed in Portugal. In Greece, these policies will miss more low-performing schools that are not necessarily socio-economically disadvantaged.

■ Figure II.M ■
Relationship between school performance and schools' socio-economic background in Greece and Portugal

Source: OECD, *PISA 2009 Database*.
StatLink 🔗 http://dx.doi.org/10.1787/888932343646
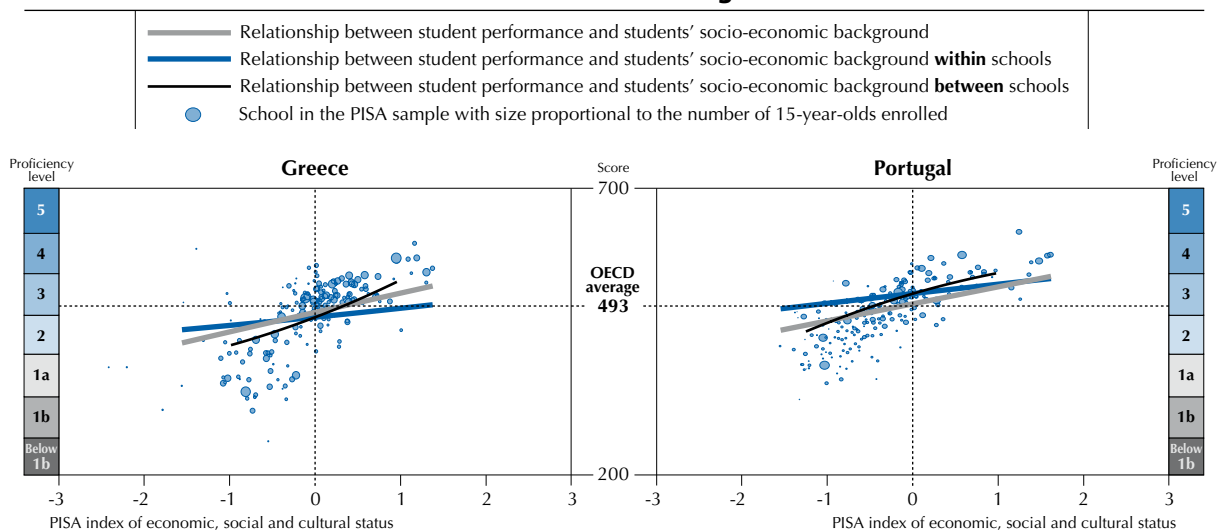
DIFFERING GRADIENTS WITHIN SCHOOLS

To some extent, school systems that separate students into different schools by ability can expect to have narrower differences in student performance within each school, both overall and relative to socio-economic background. This is also the pattern shown by PISA. However, the social disparities between schools account for more of the differences among these countries than social disparities within schools. Thus, even Norway and New Zealand,

which represent, respectively, one of the least and one of the most unequal countries in terms of between-school gradients, show similar results when analysed according to within-school gradients (Figure II.N). In no country do within-school social differences account for more than 12% of student-level performance variation. Thus, while there may be some instances where socio-economic differences within schools should be addressed, in no country will within-school measures to moderate socio-economic differences succeed on their own in creating more equal student performance.

■ Figure II.N ■
Relationship between school performance and schools' socio-economic background in Norway and New Zealand

——— Relationship between student performance and students' socio-economic background
——— Relationship between student performance and students' socio-economic background **within** schools
——— Relationship between student performance and students' socio-economic background **between** schools
● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932343646

Figure II.O shows the relationship between school performance and schools' socio-economic background for all OECD countries and partner countries and economies that are not used as examples in previous chapters. Countries and economies that appear in previous figures include the OECD countries Australia (II.H), Belgium (II.E and II.H), Canada (II.F), the Czech Republic (II.L), Estonia (II.G), Finland (II.F and II.J), Germany (II.H and II.L), Greece (II.M), Iceland (II.F), Israel (II.D), Korea (II.F), Luxembourg (II.D), Mexico (II.I and II.K), Norway (II.L and II.N), New Zealand (II.H and II.N), Poland (II.L), Spain (II.K), the United States (II.E) and the partner countries and economies Albania (II.C), Dubai (UAE) (II.D and II.I), Indonesia (II.C), Panama (II.J), Peru (II.C), Shanghai-China (II.F), Thailand (II.I) and Tunisia (II.C).

Volume IV, *What Makes a School Successful?* examines the observed relationships and identifies resources, policies and practices associated with the socio-economic inequalities seen among students, schools and school systems.

The analyses pertaining to school effectiveness presented in this report are based on data describing school offerings at the late-primary or secondary levels. However, an assessment such as PISA shows not only what young people have learned during their previous year at school, or even during their secondary school years, but also provides an indication of students' cumulative learning. A country's results in PISA, or in any assessment for that matter, depend on the quality of care and stimulation provided to children during infancy and their pre-school years, as well as on the opportunities children have to learn, both in school and at home, during their elementary and secondary school years.

Improving quality and equity thus requires a long-term view and a broad perspective. For some countries, this may mean taking measures to safeguard the healthy development of young children or to improve early childhood education. For others, it may mean socio-economic reforms that enable families to provide better care for their children. And in many countries, it may mean greater efforts to increase socio-economic inclusion and improve school offerings.
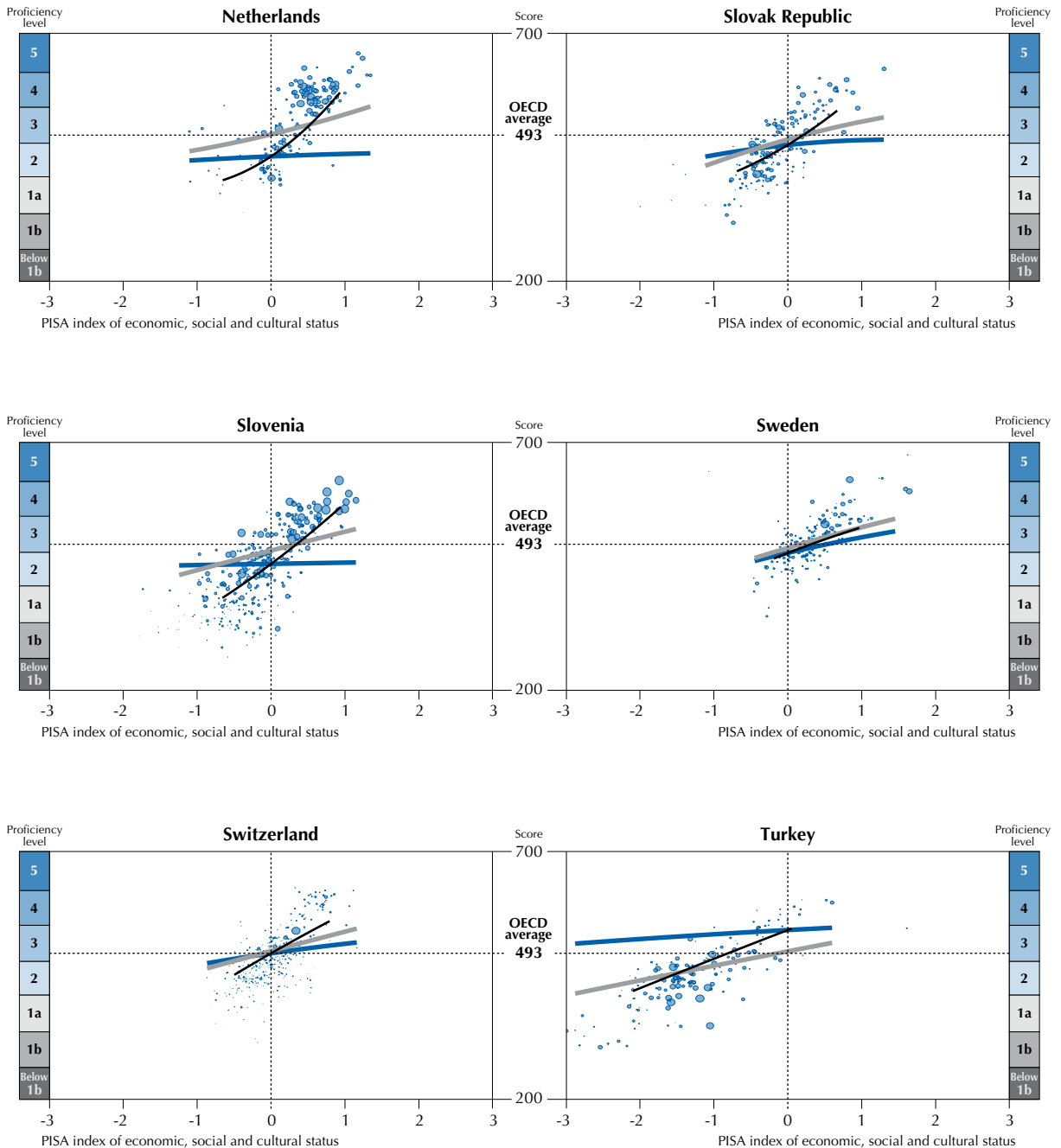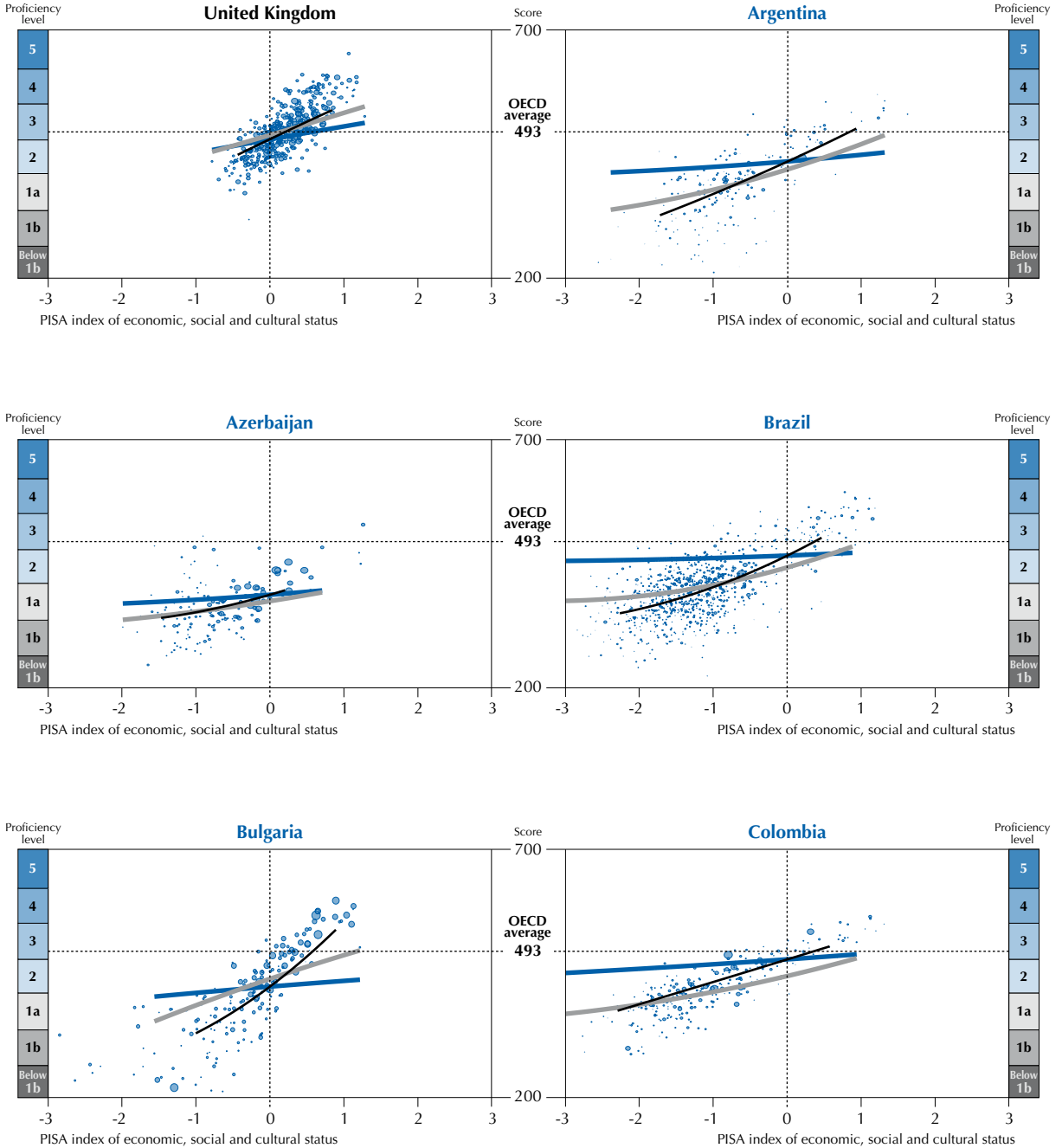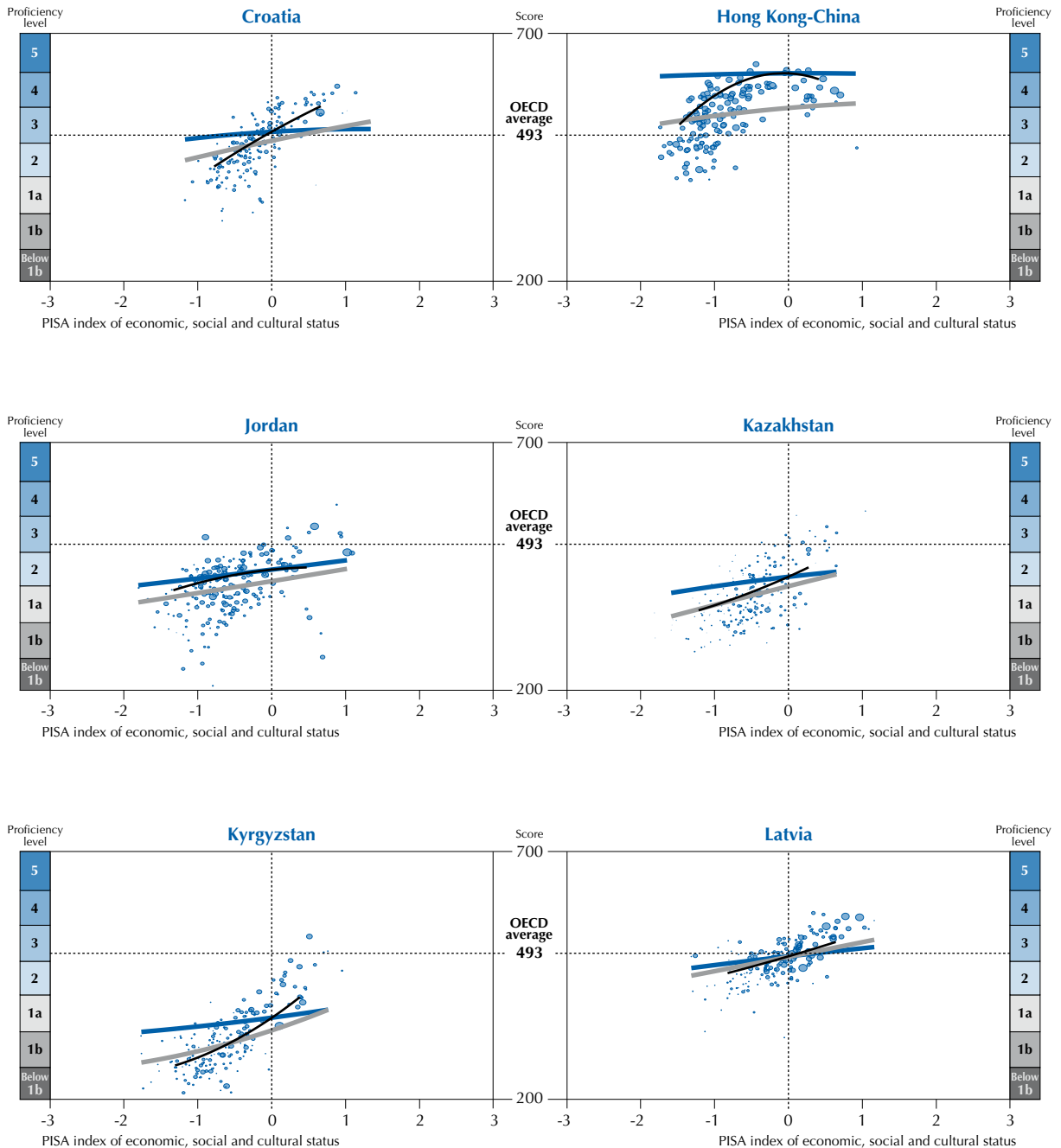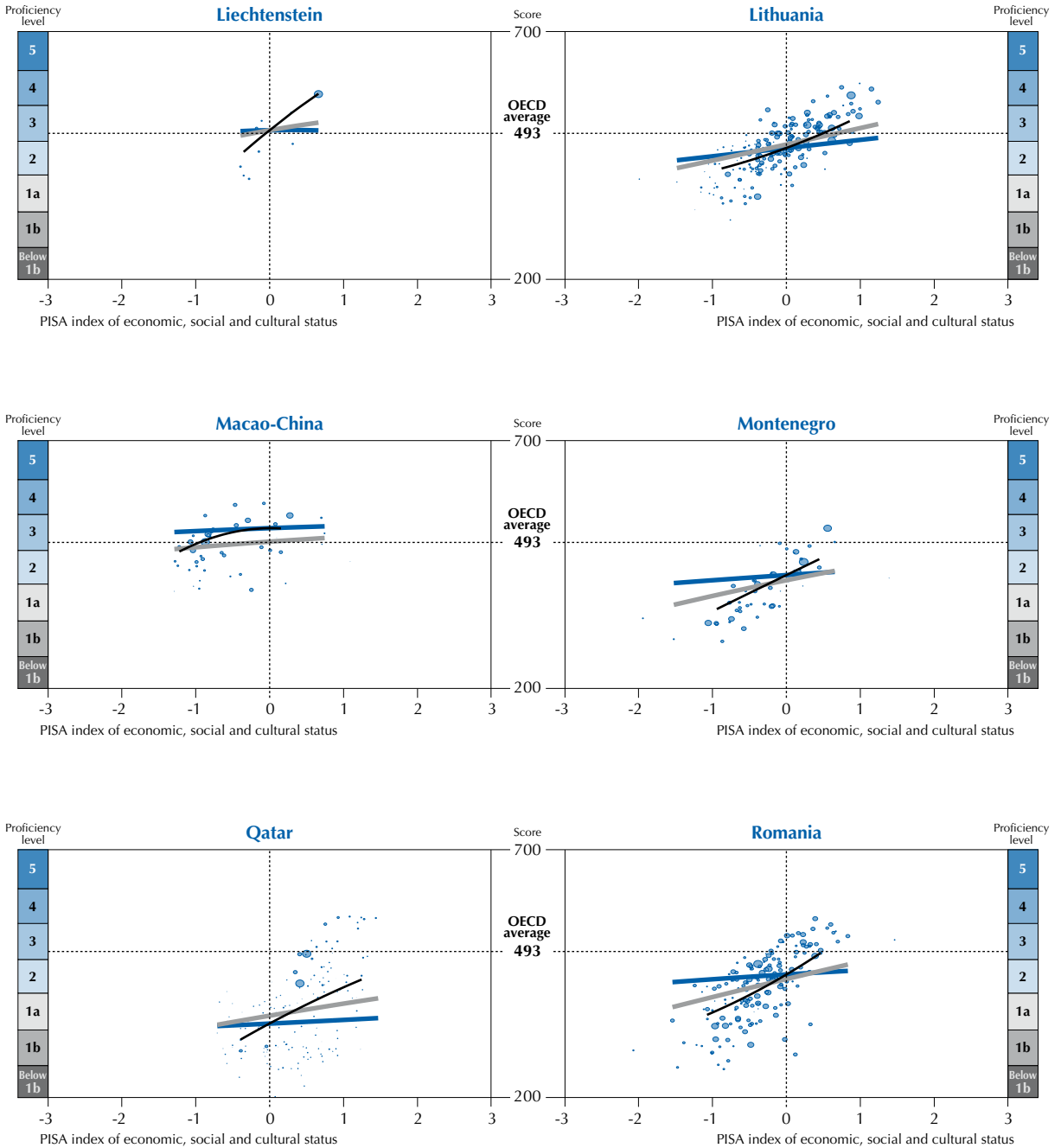
■ Figure II.O [Part 1/6] ■

Relationship between school performance and schools' socio-economic background

── Relationship between student performance and students' socio-economic background

── Relationship between student performance and students' socio-economic background **within** schools

── Relationship between student performance and students' socio-economic background **between** schools

● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932343646
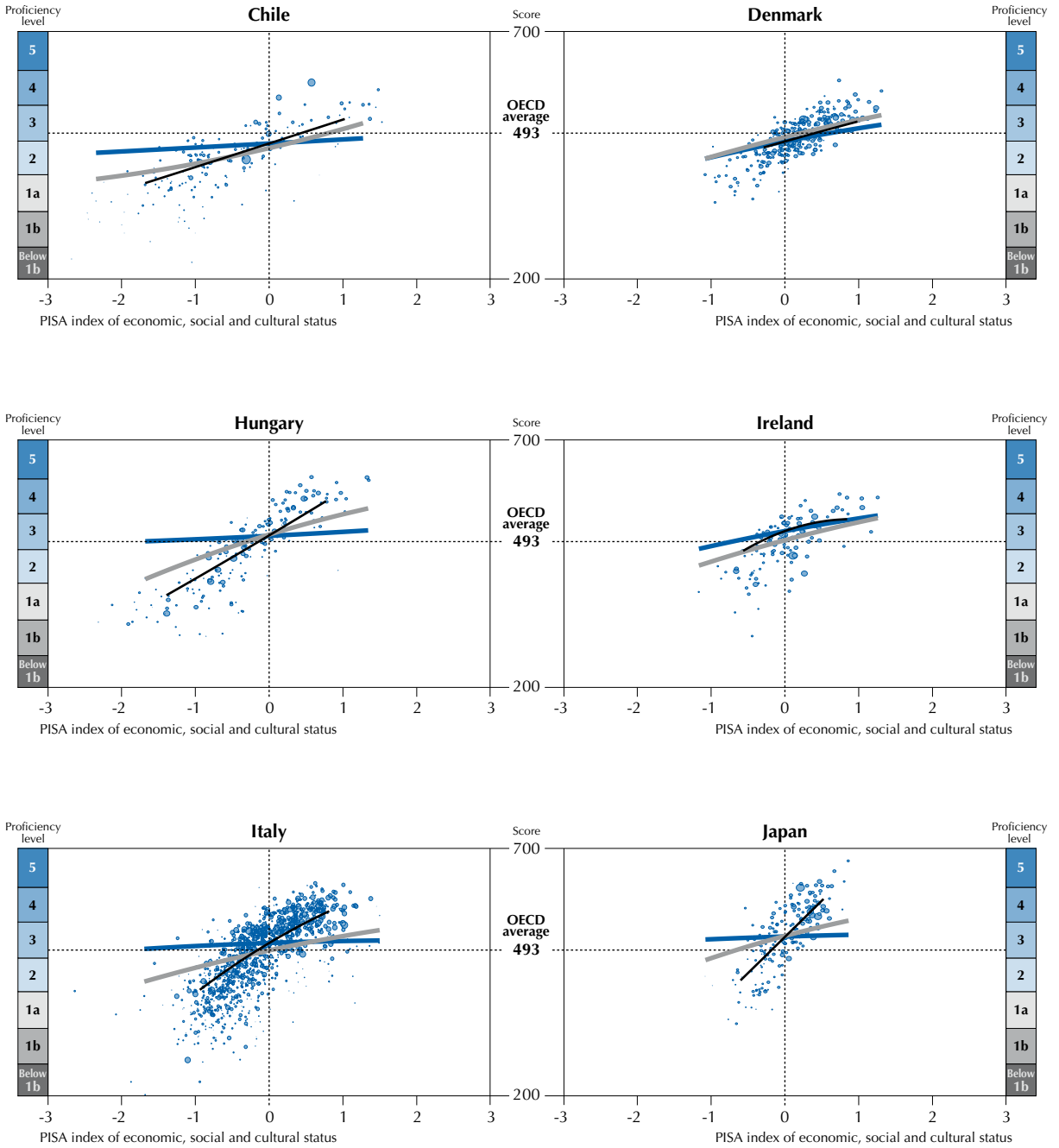
■ Figure II.O [Part 2/6] ■

Relationship between school performance and schools' socio-economic background

Relationship between student performance and students' socio-economic background

Relationship between student performance and students' socio-economic background **within** schools

Relationship between student performance and students' socio-economic background **between** schools

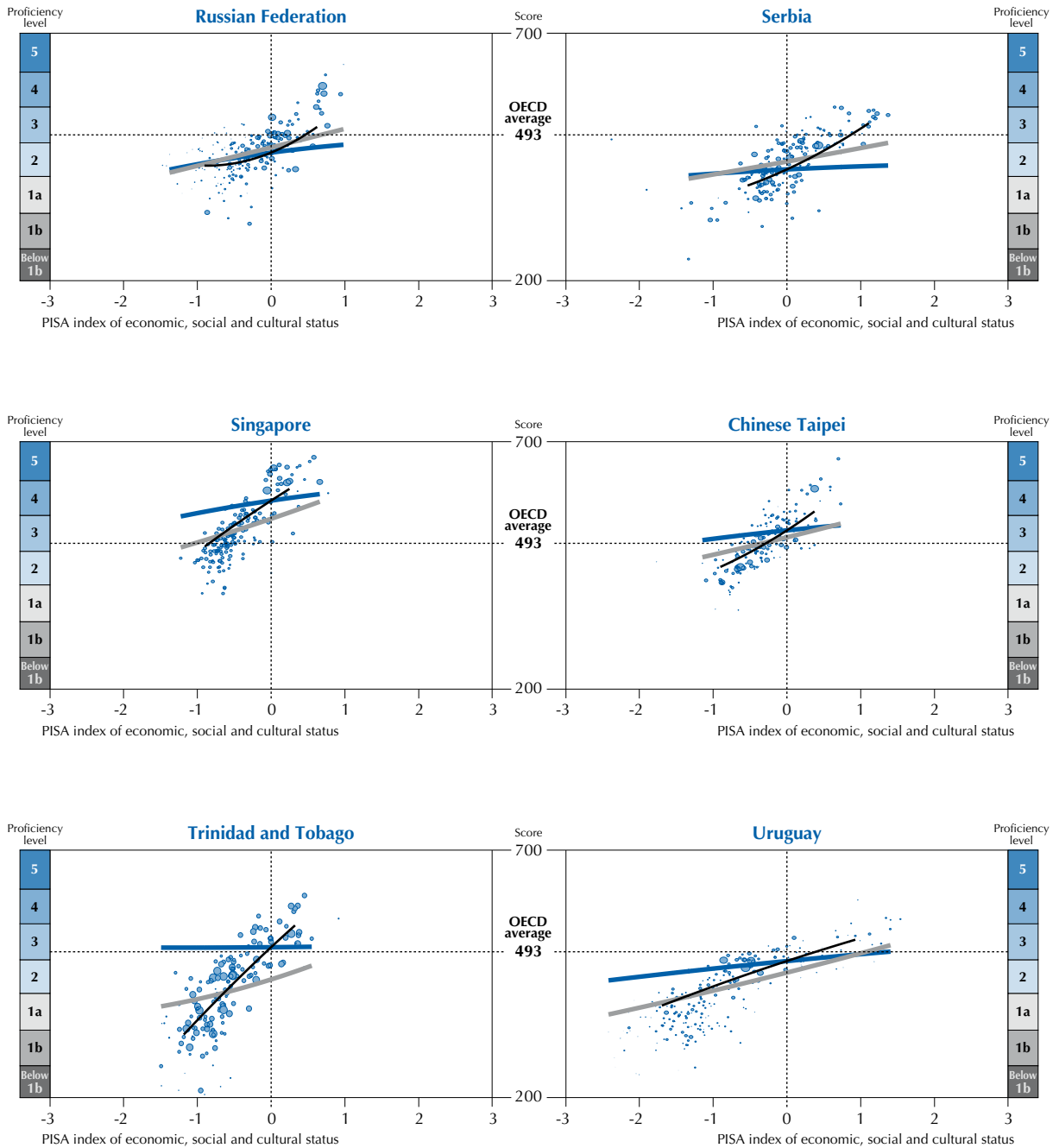School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink http://dx.doi.org/10.1787/888932343646

■ Figure II.O [Part 3/6] ■

Relationship between school performance and schools' socio-economic background
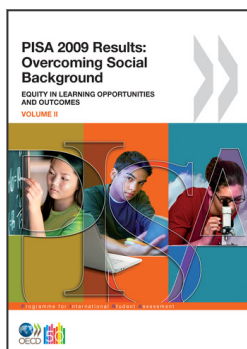
──── Relationship between student performance and students' socio-economic background

──── Relationship between student performance and students' socio-economic background **within** schools

──── Relationship between student performance and students' socio-economic background **between** schools

🔵 School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink ⌗ http://dx.doi.org/10.1787/888932343646

■ Figure II.O [Part 4/6] ■

Relationship between school performance and schools' socio-economic background

——— Relationship between student performance and students' socio-economic background

——— Relationship between student performance and students' socio-economic background **within** schools

——— Relationship between student performance and students' socio-economic background **between** schools

○ School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database*.
StatLink ᘂᐭ http://dx.doi.org/10.1787/888932343646

■ Figure II.O [Part 5/6] ■
Relationship between school performance and schools' socio-economic background

Relationship between student performance and students' socio-economic background

Relationship between student performance and students' socio-economic background **within** schools

Relationship between student performance and students' socio-economic background **between** schools

School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Source: OECD, *PISA 2009 Database.*
StatLink ⏤ http://dx.doi.org/10.1787/888932343646

■ Figure II.O [Part 6/6] ■

Relationship between school performance and schools' socio-economic background

───── Relationship between student performance and students' socio-economic background

───── Relationship between student performance and students' socio-economic background **within** schools

───── Relationship between student performance and students' socio-economic background **between** schools

● School in the PISA sample with size proportional to the number of 15-year-olds enrolled

Russian Federation

Serbia

Singapore

Chinese Taipei

Trinidad and Tobago

Uruguay

PISA index of economic, social and cultural status

OECD average 493

Source: OECD, *PISA 2009 Database.*
StatLink ᎚🔗 http://dx.doi.org/10.1787/888932343646

OECD