



3

The level of social and academic segregation across schools

This chapter analyses the sorting of students across schools by socio-economic status and ability. The degree of both social and academic segregation across schools is measured by several indicators, illustrating the various ways segregation is manifested in a school system.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

A note regarding Lithuania

Lithuania became a member of the OECD on 5 July 2018. However, consistent with other publications based on PISA 2015 data, Lithuania is shown as a partner country and is not included in the OECD average.

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ACADEMIC SEGREGATION IS OFTEN MORE WIDESPREAD ACROSS SCHOOLS THAN SOCIAL SEGREGATION

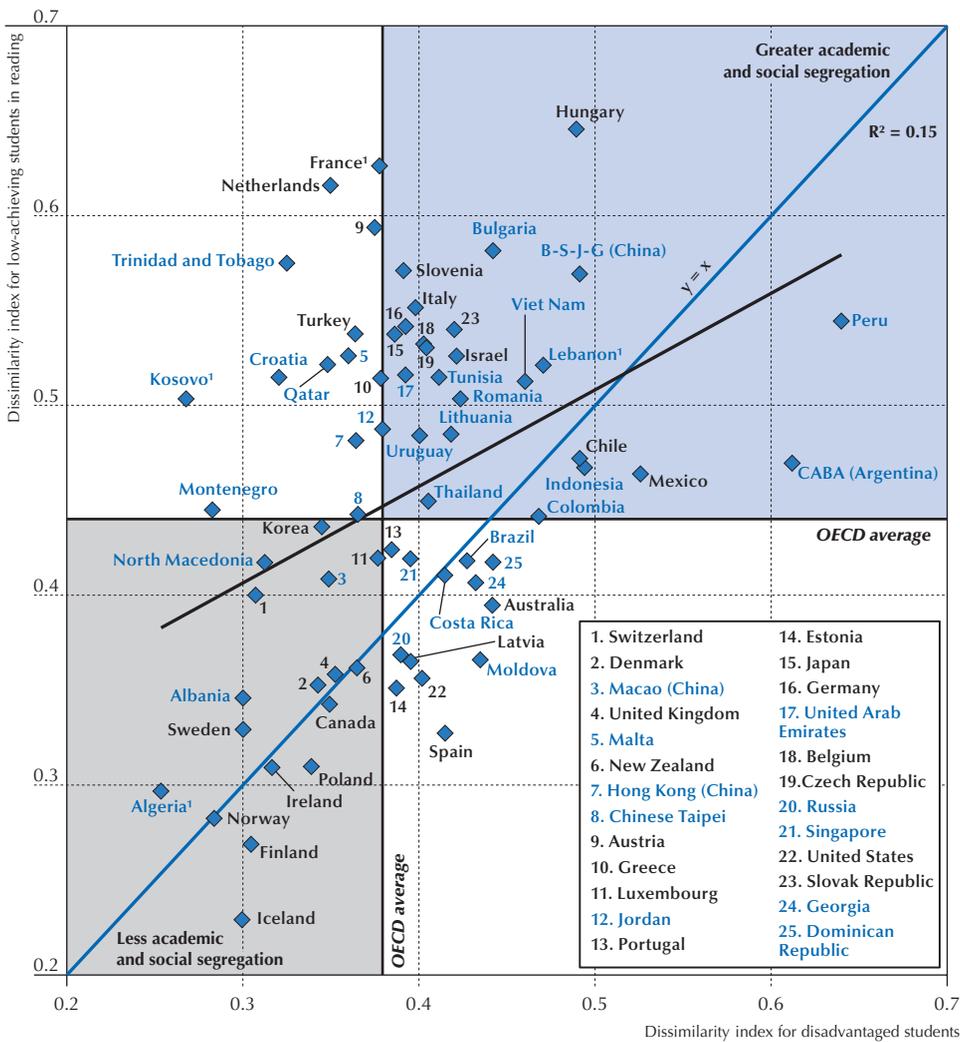
Segregation is a complex notion that cannot be fully captured by one single indicator or index (an extensive discussion is provided in Annex A). A common way of analysing school segregation is to see the extent to which students are evenly (or unevenly) distributed across schools, whatever their individual characteristics. The dissimilarity index is one of the indices most commonly used for this purpose. It is usually measured by considering two groups, for example, socio-economically disadvantaged students and students with average or advantaged status. It corresponds to the average proportions of students from both groups (e.g. disadvantaged and not-disadvantaged students) that would need to be reallocated in order to obtain an even distribution of students from these groups across all schools. This index ranges from 0 (no segregation) to 1 (full segregation). A high dissimilarity index means that the distribution of disadvantaged students across schools is different from that of students who are not considered to be disadvantaged, and thus an indication of the processes of sorting students across schools.

Using the dissimilarity index to compare academic segregation (for instance, the lowest achievers in the country compared with those who score higher in PISA) and social segregation (disadvantaged students compared with average or advantaged students),¹ results show that in almost all countries and economies, there is a higher incidence of academic segregation than social segregation (Figure 3.1). This may be due to several characteristics of the school system (such as the use of grade repetition, the age at first tracking, etc.) and not only to school practices.

For instance, Belgium and the Netherlands are amongst the few countries where a prospective student's home address is not considered at all for admission to a particular school (see Table 2.1 in Chapter 2) – and where a high level of social or academic segregation is observed. However, the correlation may also be due to the young age at first tracking. In both countries, the age at first tracking is only 12 (it is 14.2 on average across OECD countries). Because students are usually streamed according to their academic performance, and advantaged students are often over-represented amongst higher achievers, the level of social segregation across schools is high in both countries – and the level of academic segregation is even higher. In addition, as lower secondary schools are usually less selective than upper secondary schools, the level of academic segregation across schools may also depend on the country's grade-retention rate, since repeaters are more likely to be still enrolled in lower secondary school at age 15, when the PISA test is conducted.



Figure 3.1 ■ Dissimilarity index for low-achieving students in reading and for disadvantaged students



1. In Algeria, France, Kosovo and Lebanon, the proportion of 15-year-old students in modal grade schools is lower than 80% (see Table B.3), and one should interpret with caution the comparison with other countries.

Notes: All analyses are restricted to schools with the modal ISCED level for 15-year-old students. Disadvantaged students are students in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in their own country.

The R^2 value indicates the proportion of the dissimilarity index for low-achieving students in reading that is accounted for by differences in the dissimilarity index for disadvantaged students across education systems. It is a measure of the strength of the relationship between the dissimilarity index for low-achieving students in reading and the dissimilarity index for disadvantaged students at the country level.

Source: OECD, PISA 2015 Database, Table 3.1.

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IN MOST COUNTRIES, A HIGH CONCENTRATION OF LOW ACHIEVERS IN CERTAIN SCHOOLS IS MORE COMMON THAN A HIGH CONCENTRATION OF HIGH ACHIEVERS

Students' performance is influenced by their personal characteristics, but also by those of their schoolmates. Schoolmates can motivate other students and help each other overcome learning difficulties; but they can also disrupt instruction, require disproportionate attention from teachers, and be a source of anxiety. Some students may be more sensitive than others to the composition of their classes. Many recent empirical contributions emphasise the non-linearity of peer effects on student achievement (Burke and Sass, 2013^[11]; Lavy, Silva and Weinhardt, 2012^[12]; Mendolia, Paloyo and Walker, 2018^[13]). The concentration of low achievers usually has negative consequences on student performance, and this is especially the case for students who are themselves low achievers. By contrast, high-ability students are usually less sensitive than their low-achieving peers to the composition of their classes.²

If high- and low-ability students are not affected in the same way by the composition of their classes, whether schools are stratified by academic performance may have consequences on both equity and average achievement at the country level. High stratification may increase the achievement gap between students. Moreover, if the negative consequences of having low-achieving schoolmates is not balanced by the positive impact of having high-achieving peers, it may lower the average performance at the macro level.

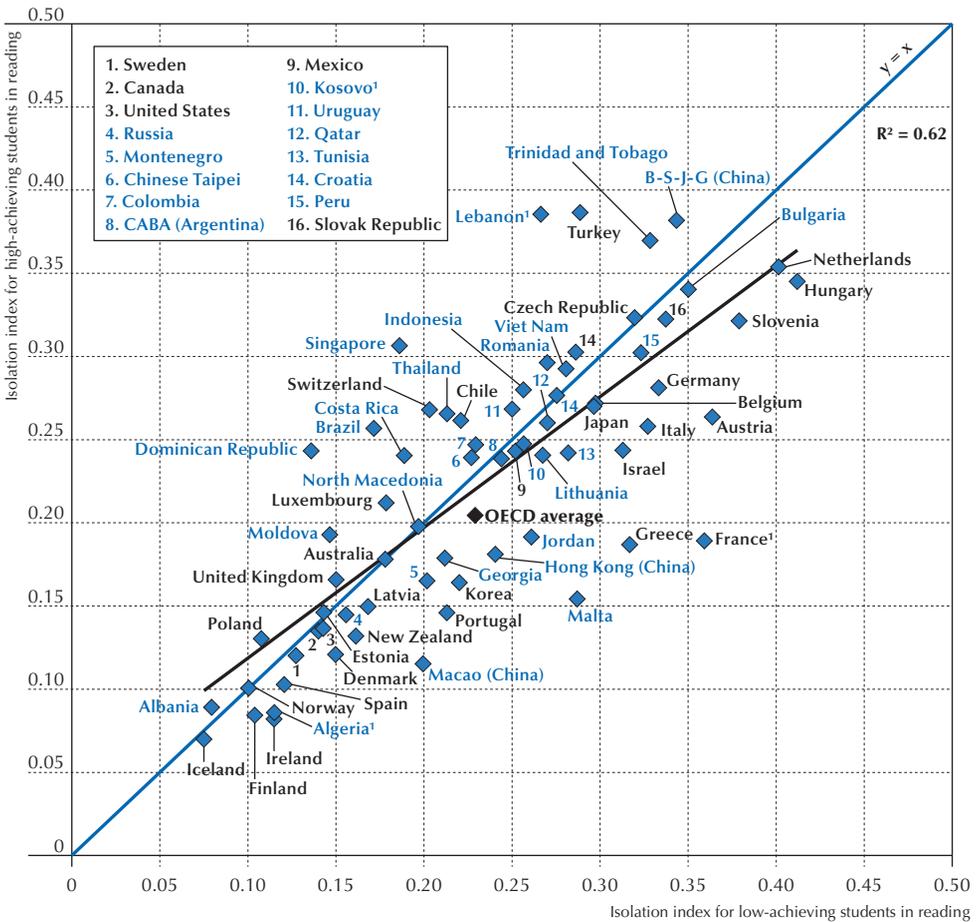
However, the allocation of students across schools may result in very different segregation patterns. In some cases, academic segregation is mainly due to the sorting of the best students into a limited number of schools; but it could also be the result of allocating the lowest achievers to disadvantaged schools.

In order to examine peer effects, an indicator that more directly focuses on the concentration of some types of students in certain schools may be more useful than the dissimilarity index (for a visualisation of the measure provided by segregation indices, see Annex A). The isolation index, which also ranges from 0 to 1, allows for an analysis of whether school systems create “clusters” of students, depending on their characteristics. It is negatively correlated with the probability that a “typical” student from a certain group (for instance, a disadvantaged student) would be in contact at school with students who do not belong to his or her group (students with average or advantaged status). One may also estimate the isolation of low achievers (meaning their concentration in a few specific schools) or the isolation of high achievers (their concentration in a few specific schools).

The indicators of isolation of low and high achievers (low achievers are those who score in the bottom quarter of the PISA performance distribution at the country level; high achievers those who score in the top quarter) were, as expected, strongly correlated in 2015 (Figure 3.2). In some countries, such as Hungary and the Netherlands, both indices were especially high, while in others, such as Albania, Finland, Iceland and Norway, both were low. These indicators did not always coincide, however. Only in a few cases was the concentration of bright students in “good” schools much higher than the concentration of low achievers. This was notably the case in Brazil, the Dominican Republic, Lebanon, Singapore and Turkey. By contrast, in Austria, France, Greece and Malta, the concentration of low achievers is much higher than that of high achievers.³



Figure 3.2 ■ Isolation of low-achieving and high-achieving students in reading



1. In Algeria, France, Kosovo and Lebanon, the proportion of 15-year-old students in modal grade schools is lower than 80% (see Table B.3), and one should interpret with caution the comparison with other countries.

Notes: All analyses are restricted to schools with the modal ISCED level for 15-year-old students.

The R^2 value indicates the variance of the isolation of high-achieving students in reading that is accounted for by differences in the isolation of low-achieving students in reading across education systems. It is a measure of the strength of the relationship between the isolation of high-achieving students in reading and the isolation of low-achieving students in reading at the country level.

Source: OECD, PISA 2015 Database, Table 3.2.

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IN MOST COUNTRIES, THERE ARE MORE SCHOOLS WITH A HIGH CONCENTRATION OF ADVANTAGED STUDENTS THAN WITH A HIGH CONCENTRATION OF DISADVANTAGED STUDENTS

Disadvantaged students usually face specific obstacles to success in their education. They may not, for example, benefit from the same parental support to monitor their school progress as students with more educated parents; and sorting students by socio-economic status across schools may reinforce this deficit. For instance, disadvantaged schools may have less financial resources or may attract less-qualified teachers. One may thus compare whether the degree of segregation across schools in a country/economy stems mostly from the isolation of disadvantaged students from more advantaged students or from the isolation of advantaged students, or both.

Generally, in almost all countries and economies that participated in PISA 2015, the isolation index for disadvantaged students was lower than that for advantaged students. This means that disadvantaged students were more likely, on average, to be in the same schools as more advantaged students than advantaged students were to be in the same school as average or disadvantaged students (Figure 3.3). This situation was especially marked in Chile, Colombia, Costa Rica, Macao (China), Thailand and Uruguay. In some countries, the pattern may be even more pronounced. For example, amongst countries with a concentration of disadvantaged students at the same level as the OECD average (0.16), in Japan, the concentration of advantaged students is relatively low (the isolation index is 0.15), while in Uruguay this same index is relatively high (0.29) as it is in Portugal and Singapore (both 0.23).

In a few countries and economies, however, such as Ciudad Autónoma de Buenos Aires (Argentina), Israel, Peru, Mexico and the Russian Federation, social segregation across schools mainly reflected the fact that disadvantaged students were often “clustered” in some schools, and were thus less likely to interact with students from other socio-economic backgrounds. Such patterns may reflect patterns of residential segregation or arise if middle-class parents are more apt to avoid disadvantaged schools and choose to enroll their children in more advantaged schools, if possible, thus “leaving behind” the most disadvantaged students in low quality schools (OECD, 2018^[4]).

As observed above, social segregation across schools was slightly less prevalent than academic segregation in 2015. The isolation index of disadvantaged students (those with a socio-economic status below the first quartile of the distribution at the country level) was 0.16, on average across OECD countries (Figure 3.3), while the isolation index for low achievers was 0.23 (Figure 3.2).

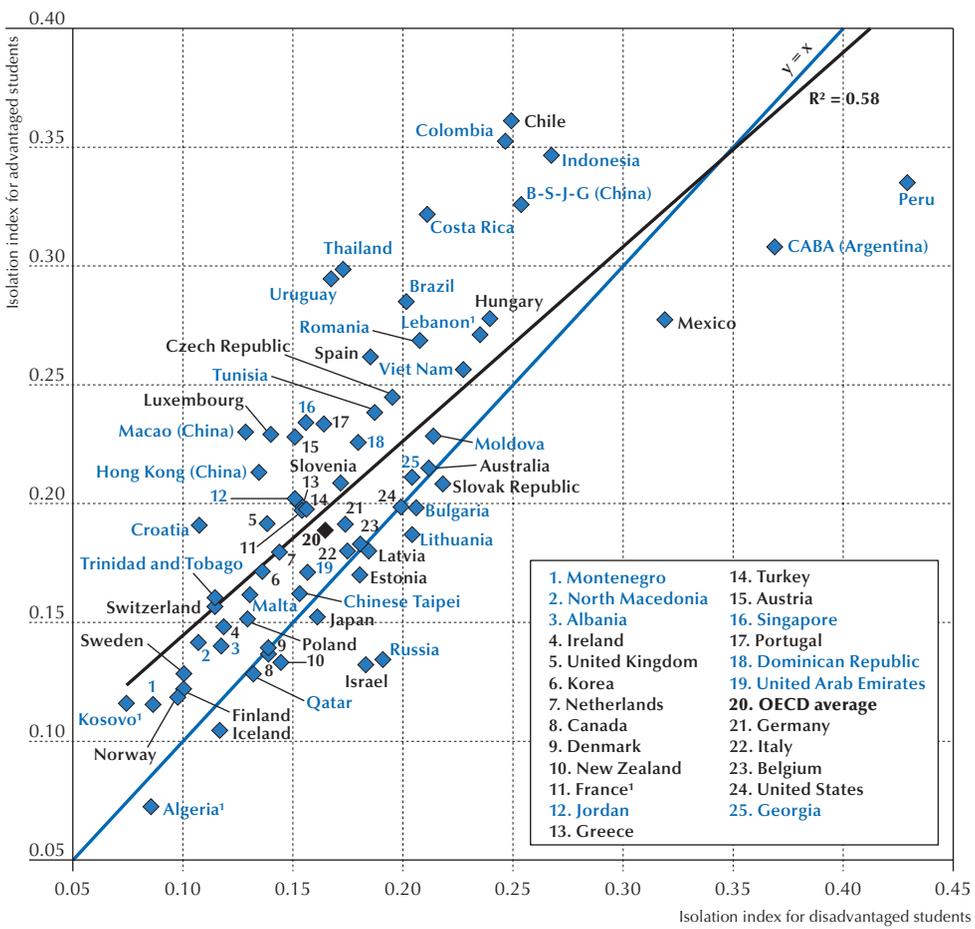
One may also question the extent to which disadvantaged students in a country are exposed, at school, to students who are high achievers in PISA (defined as students who score higher than the top quartile of performance). Figure 3.4 illustrates the extent to which a typical disadvantaged student in a country is unlikely to be in a school that enrolls high-achieving students. The index has a value close to one when disadvantaged students are clustered in schools that do not enrol high-achieving students, while it has medium values when disadvantaged students or high achievers are spread across schools (for a detailed discussion, see Annex A).

Figure 3.4 shows large disparities across countries. Countries and economies where disadvantaged students are more often concentrated in schools without high achievers are Beijing-Shanghai-Jiangsu-Guangdong (China), Bulgaria, Ciudad Autónoma de Buenos Aires (Argentina), Chile,



the Czech Republic, Hungary, Peru, Mexico, Singapore and Slovenia. By contrast, countries and economies where disadvantaged students are evenly distributed across schools, including schools that enrol high achievers, are Algeria, Canada, Denmark, Finland, Iceland, Ireland, Jordan, Macao (China), Norway and Sweden.

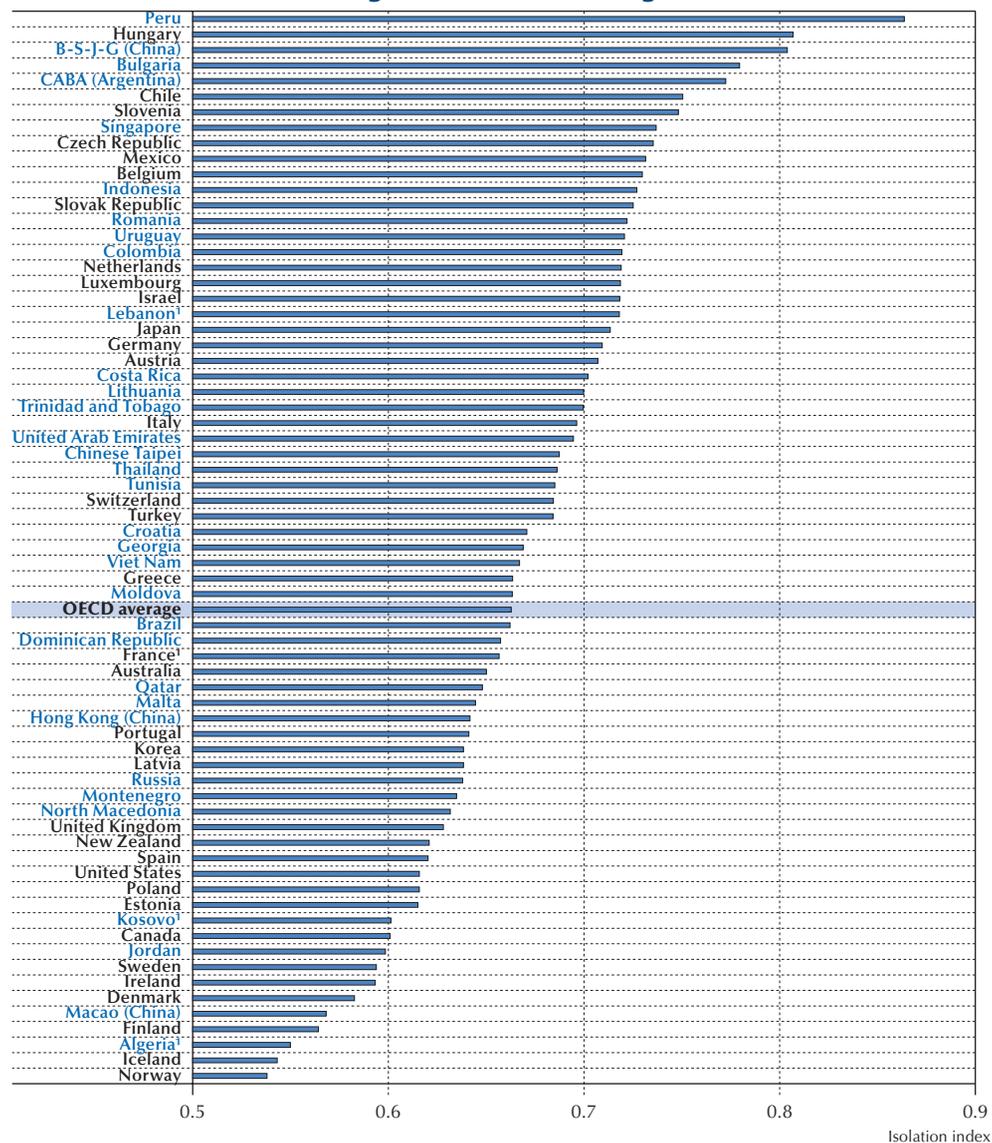
Figure 3.3 ■ Isolation of disadvantaged and advantaged students



1. In Algeria, France, Kosovo and Lebanon, the proportion of 15-year-old students in modal grade schools is lower than 80% (see Table B.3), and one should interpret with caution the comparison with other countries.
Notes: All analyses are restricted to schools with the modal ISCED level for 15-year-old students. Disadvantaged students are students in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in their own country. Advantaged students are students in the top quarter of the PISA index of economic, social and cultural status (ESCS) in their own country.
 The R² value indicates the variance of the isolation of advantaged students that is accounted for by differences in the isolation of disadvantaged students across education systems. It is a measure of the strength of the relationship between the isolation of disadvantaged and the isolation of advantaged students at the country level.
Source: OECD, PISA 2015 Database, Table 3.3.

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Figure 3.4 ■ Isolation of disadvantaged students from national high achievers in reading



1. In Algeria, France, Kosovo and Lebanon, the proportion of 15-year-old students in modal grade schools is lower than 80% (see Table B.3), and one should interpret with caution the comparison with other countries.

Notes: All analyses are restricted to schools with the modal ISCED level for 15-year-old students.

Disadvantaged students are students in the bottom quarter of the PISA index of economic, social and cultural status (ESCS) in their own country.

Countries and economies are ranked in descending order of the isolation of disadvantaged students from national high achievers in reading.

Source: OECD, PISA 2015 Database, Table 3.4.

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This measure is also expected to be negatively correlated with the proportion of resilient students in countries. In school systems where socio-economic status is weakly associated with performance, disadvantaged students are more likely to overcome their initial difficulty and perform well at school (the definition of resilience). Given the same level of concentration of disadvantaged students in schools, the index may be lower in countries and economies with a high proportion of resilient students. This is especially the case when admission to school depends on proven ability, as resilient disadvantaged students are more likely to be enrolled in “good” schools.⁴

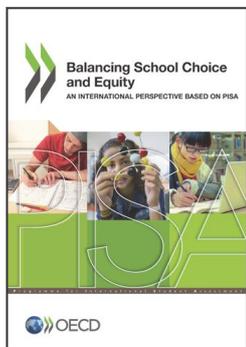


Notes

1. Low achievers are defined here as students who perform below the first quartile of the distribution of PISA performance in their country; disadvantaged students are those whose value in the PISA index of economic, social and cultural status (ESCS) is below the first quartile of the distribution in their country.
2. This is illustrated, for instance, by the results obtained by comparing the achievement of students just below or just above a threshold of admissions in Boston and New York high schools (Abdulkadiroğlu, Angrist and Pathak, 2014^[5]). The achievement outcomes of those who had attended these so-called “elite” schools do not differ from those who just failed the entrance exam. Similar results have also been observed by (Dobbie and Fryer, 2014^[6]) and in Kenyan high schools (Lucas and Mbiti, 2014^[7]).
3. In France and Lebanon, less than 80% of 15-year-old students are enrolled in schools with the modal grade (see Table B.3); therefore, comparisons should be interpreted with caution.
4. For the sake of comparison, on average across OECD countries, 11.3% of disadvantaged students scored in the first quarter of the PISA performance distribution in their own country/economy in 2015.

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