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The Performance Profiles of Immigrant Students

This chapter provides an overview of the results emerging from PISA 2009 on the performance and socio-economic background of immigrant students. What do they know and what can they do? How do they differ from other students? The evidence highlights the differences and similarities across countries with respect to the challenges and opportunities posed by immigrant student populations. Recent trends show that performance differences are related to both policy and the underlying profiles of immigrant populations.

INTRODUCTION

Students who come from other countries, or whose parents do, add to the diversity of student populations. While this diversity enriches education systems, it can also pose significant challenges for educators and policy makers. In many countries, immigrant students constitute a sizable proportion of the student population – and form a diverse group, with different backgrounds and skill levels.

What distinguishes immigrant students? Are there common patterns in their outcomes and characteristics across countries?

KNOWLEDGE AND SKILLS DISADVANTAGE AMONG IMMIGRANT STUDENTS

Average performance

Figure 2.1 highlights the performance differences in the PISA 2009 reading scale between immigrant and non-immigrant students.[1] The PISA reading scale was set to yield a mean of 500 score points for OECD countries in PISA 2000, with a standard deviation of 100 (in 2009, these were 493 and 93 respectively). In 2009, immigrant students scored lower in reading than non-immigrant students in 23 out of 28 OECD countries with sufficient data. The performance gap reaches 99 score points in Mexico, more than 80 in Iceland and more than 72 in Italy. In Finland, Austria, Belgium, Sweden, Denmark and France, the gap is 60 score points or more, the equivalent of more than a year and a half of schooling (Table B2.1a).

Among OECD countries, only Australia, Canada, the Czech Republic, Hungary and Israel show no overall performance differences between students by immigrant background. In Hungary, most migrants consist of ethnic Hungarians from neighbouring countries and in the Czech Republic, they consist mainly of persons born in the Slovak Republic. Australia and Canada select and admit significant numbers of highly educated migrants every year, whose children do well in school. In Israel, most migration is of an ethnic/religious character. All of these are special situations which may encourage better outcomes by immigrant students.

In general, immigrant populations are less prominent in partner countries and economies; in ten of them, the populations are too small to be included in this report.[2] Patterns in performance gaps are also more complex. In Qatar, Dubai (UAE), Kyrgyzstan, Serbia, Jordan and Macao-China, immigrant students perform better in reading than non-immigrant students. None of these cases, however, correspond to typical immigrant situations encountered in OECD countries. In Qatar and Dubai (UAE), significant numbers of immigrant students were administered the PISA test in English and in Kyrgyzstan it was administered in Russian. In Serbia, most immigrants speak Serbian at home, in Jordan, Arabic, and in Macao-China, Chinese (Table B1.5). In Croatia, Lithuania, the Russian Federation, Liechtenstein, Argentina, Brazil and Colombia, immigrant students have lower reading scores than non-immigrant students. In Montenegro, Kazakhstan, Singapore, Trinidad and Tobago, Azerbaijan, Hong Kong-China, Latvia and Panama, there are no apparent differences in the performance between immigrant students and those without (Figure 2.1 and Table B2.1a).

The performance advantage in reading among non-immigrant students is mirrored in other assessment domains. Performance gaps are similar for mathematics and science (Tables B2.1b and B2.1c, respectively). Out of 28 OECD countries with sufficient data, non-immigrant students outscore immigrant students in 25 countries in science and 24 countries in mathematics. Only in Australia do immigrant students perform better in mathematics than non-immigrant students. The patterns among partner countries and economies are similar to those described for reading.

Performance differences across the distribution of performance

Over- or under-representation of immigrant students among low or high achievers

Average performance gaps can mask important differences between immigrant and non-immigrant students in the distribution of performance. PISA proficiency levels provide an indication of what students know and can do; they describe the kinds of reading skills 15-year-olds students demonstrated in the assessment. Therefore, differences in the proportion of students who reach a certain level of proficiency provide a deeper understanding of the differences in skills between students by immigrant background.

The 25th percentile among non-immigrant students provides a practical country-specific benchmark for low performance. Likewise, the 75th percentile will be used as a benchmark for high performance. The 50th percentile divides the population of non-immigrant students into two halves and provides a measure of the typical performance for this group of students. Figure 2.2 shows the proportion of immigrant students who scored below the 25th, 50th and 75th percentiles.

With a couple of important exceptions, immigrant students are over-represented among low achievers and under-represented among high achievers, as shown in Figure 2.2. Given their performance disadvantage, it is no surprise that the proportion of immigrant students that score below the 25th percentile exceeds 25% in all OECD countries (except Australia, Hungary and Israel). Perhaps more surprisingly, it is as high as 72% in Mexico and exceeds 50% in eight OECD countries (Spain, Sweden, Belgium, Austria, Denmark, Italy, Finland and Iceland). Except for Australia, Hungary and the Czech Republic, in no OECD country is the proportion of immigrant students who score below the 75th percentile lower than 75%. On average, it reaches 86% in the OECD and it is above 90% in 10 OECD countries (Mexico, Iceland, Italy, Spain, Denmark, Austria, Slovenia, Belgium and Germany) (Table B2.1d).

■ Figure 2.1 ■
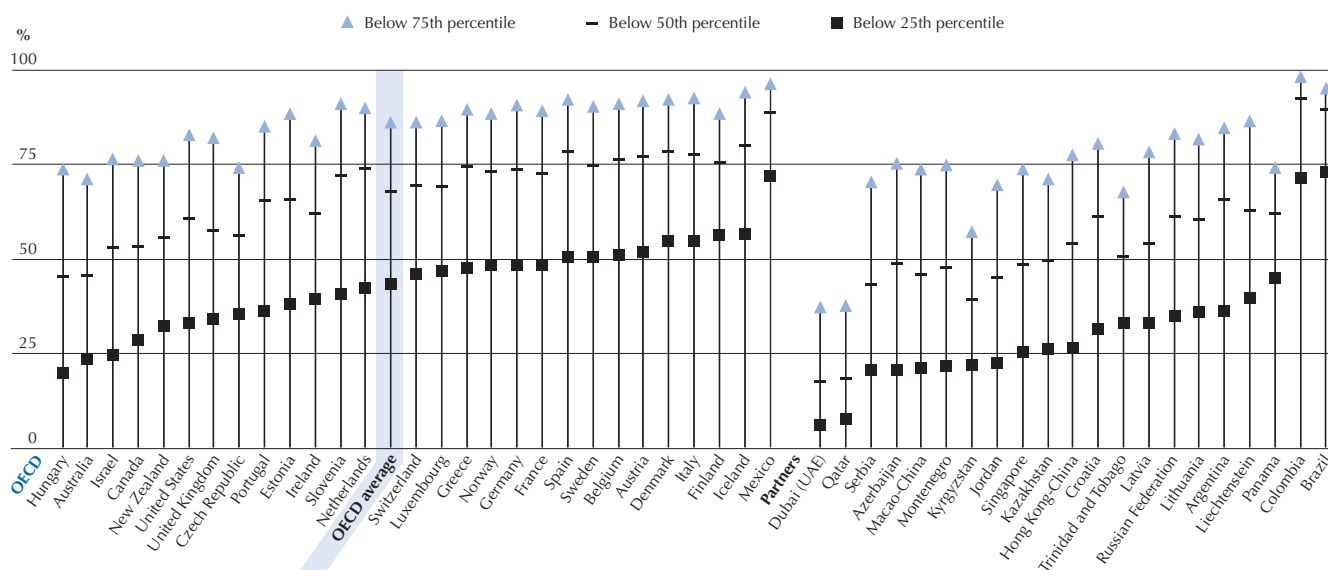## Performance disadvantage of immigrant students
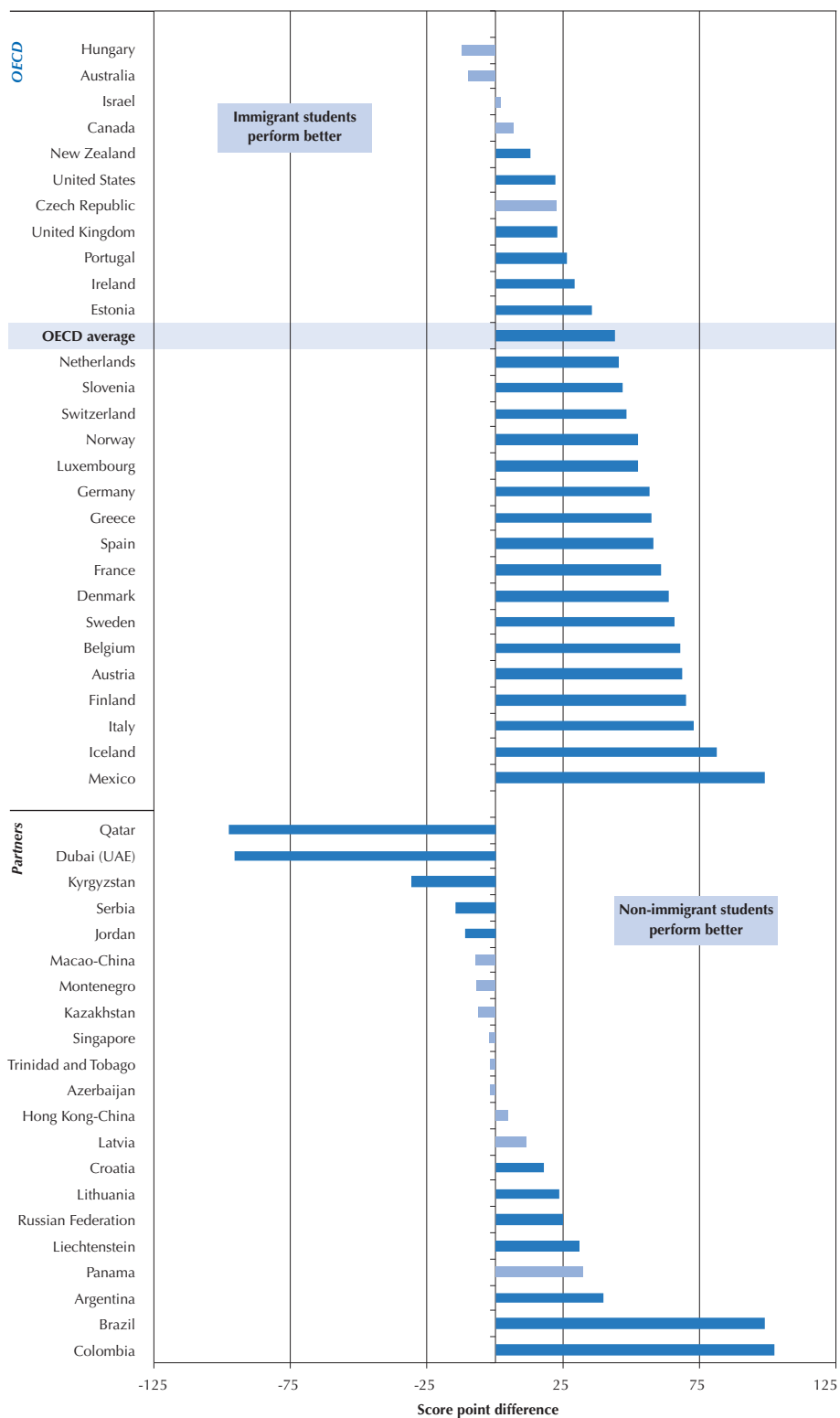
Note: Score point differences that are statistically significant are shown in a darker tone.

Countries are ranked in ascending order of the score point difference between non-immigrant students and immigrant students (first- and second-generation).

Source: Table B2.1a.

■ Figure 2.2 ■
Representation of immigrant students among high and low achievers

Countries are ranked in ascending order of the percentage of immigrant students below the 25th percentile of performance among non-immigrant students.

Source: Table B2.1d.

The Czech Republic, Ireland and Finland represent important exceptions to the general patterns of over/under representation. These are all cases of countries where the under-representation of immigrant students among high achievers is relatively low compared with the over-representation of immigrant students among low performers. This finding suggests that in these countries the population of immigrant students is quite diverse and can sensibly be divided into two groups: high- and low-performing immigrant students.

The same general patterns are also evident among partner countries and economies, but the extremes are even more marked. For example, more than 70% of immigrant students score below the 25th percentile in Brazil and Colombia, whereas in Dubai (UAE) and Qatar, it is less than 8%. In Kyrgyzstan, Trinidad and Tobago and Panama, there is evidence of a significant proportion of high achievers among immigrant students, especially given the proportion of immigrant students scoring below the 25th percentile (Table B2.1d).

Reading skills by immigrant background

In PISA reading skills are described in terms of proficiency levels. These levels are helpful for providing information on what students' scores in the PISA reading scale mean in substantive terms. For PISA 2009, the range of difficulty of the test questions allowed for the description of seven levels of reading proficiency: Level 1b is the lowest described proficiency level, then Level 1a, Level 2, Level 3 and so on up to Level 6.

Each proficiency level is described based on the kinds of skills and knowledge students need to successfully complete the assessment tasks and questions. Students proficient at Level 1b are likely to be able to complete Level 1b tasks successfully, but are unlikely to be able to complete tasks at higher levels. Level 6 reflects tasks that present the greatest challenge in terms of reading skills and knowledge. Students with scores in this range are likely to be able to successfully complete reading tasks at that level, as well as all the other reading tasks in PISA.

A student's performance on the questions in the test is associated with a score which corresponds to a specific level on the reading scale. This allows the score to be associated with a defined proficiency level. The student's level is defined to be the highest level for which he or she would be expected to answer a majority of a random selection of questions correctly at that particular level. Thus, for example, in an assessment composed of tasks spread uniformly across Level 3, students with a score located at Level 3 would be expected to complete at least 50% of the tasks successfully. Because a level covers a range of difficulties and proficiencies, success rates across this range can vary. Students near the bottom of the level would be likely to succeed on just over 50% of the tasks spread uniformly across the level, while students at the top of the level would be likely to succeed on well over 70% of the same tasks.

Figure 2.3 provides details on the nature of the reading skills, knowledge and understanding required at each level of the reading scale.

■ Figure 2.3 ■
PISA reading proficiency levels

Level	Lower score limit	Percentage of students able to perform tasks at each level or above (OECD average)	Characteristics of tasks
6	698	0.8% of students across the OECD can perform tasks at Level 6 on the reading scale	Tasks at this level typically require the reader to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the reader to deal with unfamiliar ideas, in the presence of prominent competing information, and to generate abstract categories for interpretations. Reflect and evaluate tasks may require the reader to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understandings from beyond the text. A salient condition for access and retrieve tasks at this level is precision of analysis and fine attention to detail that is inconspicuous in the texts.
5	626	7.6% of students across the OECD can perform tasks at least at Level 5 on the reading scale	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis, drawing on specialised knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
4	553	28.3% of students across the OECD can perform tasks at least at Level 4 on the reading scale	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesise about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
3	480	57.2% of students across the OECD can perform tasks at least at Level 3 on the reading scale	Tasks at this level require the reader to locate, and in some cases recognise the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorising. Often the required information is not prominent or there is much competing information; or there are other obstacles in the text, such as ideas that are contrary to expectation or negatively worded. Reflective tasks at this level may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.
2	407	81.2% of students across the OECD can perform tasks at least at Level 2 on the reading scale	Some tasks at this level require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.
1a	335	94.3% of students across the OECD can perform tasks at least at Level 1a on the reading scale	Tasks at this level require the reader: to locate one or more independent pieces of explicitly stated information; to recognise the main theme or author's purpose in a text about a familiar topic; or to make a simple connection between information in the text and common, everyday knowledge. Typically the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.
1b	262	98.9% of students across the OECD can perform tasks at least at Level 1b on the reading scale	Tasks at this level require the reader to locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. The text typically provides support to the reader, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation the reader may need to make simple connections between adjacent pieces of information.

Source: OECD PISA 2009 Database, Figure I.2.12.

Proficiency Level 2 is considered a baseline level of proficiency, at which students begin to demonstrate the reading skills that will enable them to participate effectively and productively in life. Students who do not reach Level 2 have difficulties locating basic information that meets several conditions, making comparisons or contrasts around a single feature, working out what a well-defined part of a text means when the information is not prominent, or making connections between the text and outside knowledge by drawing on personal experience and attitudes. Students scoring below Level 2 are the lowest performers in PISA.

Top performers are those students proficient at Levels 5 or 6 of the assessment. Top performers can tackle some of the most complex tasks and questions in PISA. At a minimum, they can infer what is relevant in a text and retrieve information by locating and organising several pieces of information deeply embedded in the text. They are capable of critical evaluation, drawing on specialised knowledge and can deal with concepts that are contrary to their expectations. And they can interpret and reflect on texts that are unfamiliar both in terms of the content or form.

Analysing PISA performance across performance levels highlights important skill differences across immigrant background in the student populations of each system. One way to do this is by studying the proportion of lowest and top performers among immigrant and non-immigrant students. In general, there are higher proportions of low performers among immigrant students and higher proportions of top performers among non-immigrant students. The ratio of low performers among students with and without an immigrant background is a good measure of skill inequality at the bottom of the distribution: the higher the ratio, the bigger the proportion of low performers among immigrant students relative to the proportion of low performers among non-immigrant students. At the top of the distribution, the reverse is true and therefore it is the ratio of top performers among immigrant and non-immigrant students that provides a good measure of inequality. In the case of skill inequality at the top of the performance distribution, the higher the ratio, the bigger the proportion of top performers will be among non-immigrant students relative to the proportion of top performers among immigrant students.

In Figure 2.4, education systems are ranked according to the ratio of the lowest performers among immigrant and non-immigrant students, which appears in parenthesis next to the country name in the horizontal axis. As the figure shows, the proportion of the lowest performers is higher among immigrant than non-immigrant students. The disadvantage for immigrant students is apparent in all OECD countries except for Australia, Hungary, Israel, the Czech Republic and Iceland (Table B2.1f). In no OECD country are the lowest performers more common among non-immigrant students.

Across the OECD the proportion of the lowest performers among immigrant students is almost twice as high as the proportion of the lowest performers among non-immigrant students. Skill inequality at the bottom of the distribution, the ratio of the lowest performers, reaches 3.9 in Finland and more than 2.5 in Denmark, Iceland, Belgium and Sweden.[3] In contrast, in Israel, Australia and Hungary the ratio falls below one because the proportion of low performers is higher among non-immigrant than among immigrant students.

■ Figure 2.4 ■

Skills and knowledge inequality across immigrant background at the bottom of the performance distribution, lowest performers by immigrant background
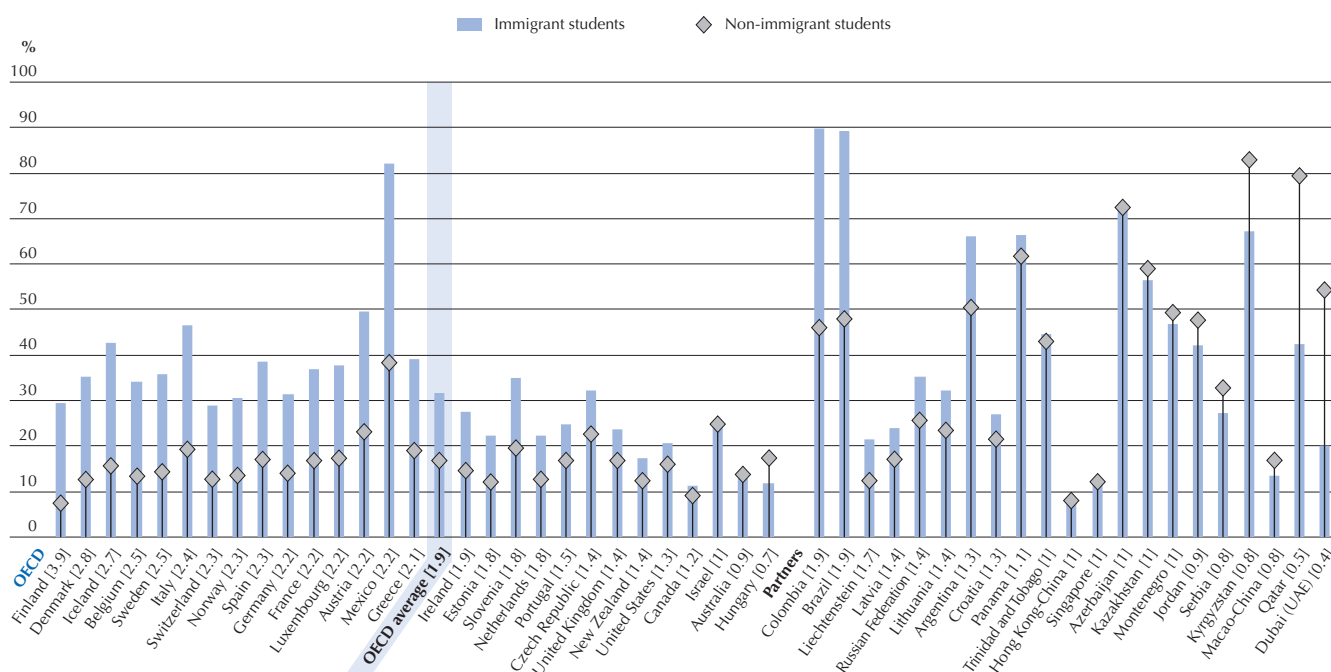
Note: Relative risk of low performance for immigrant students is indicated in brackets next to the country names.

Countries are ranked in descending order of the relative risk of low performance for immigrant students.
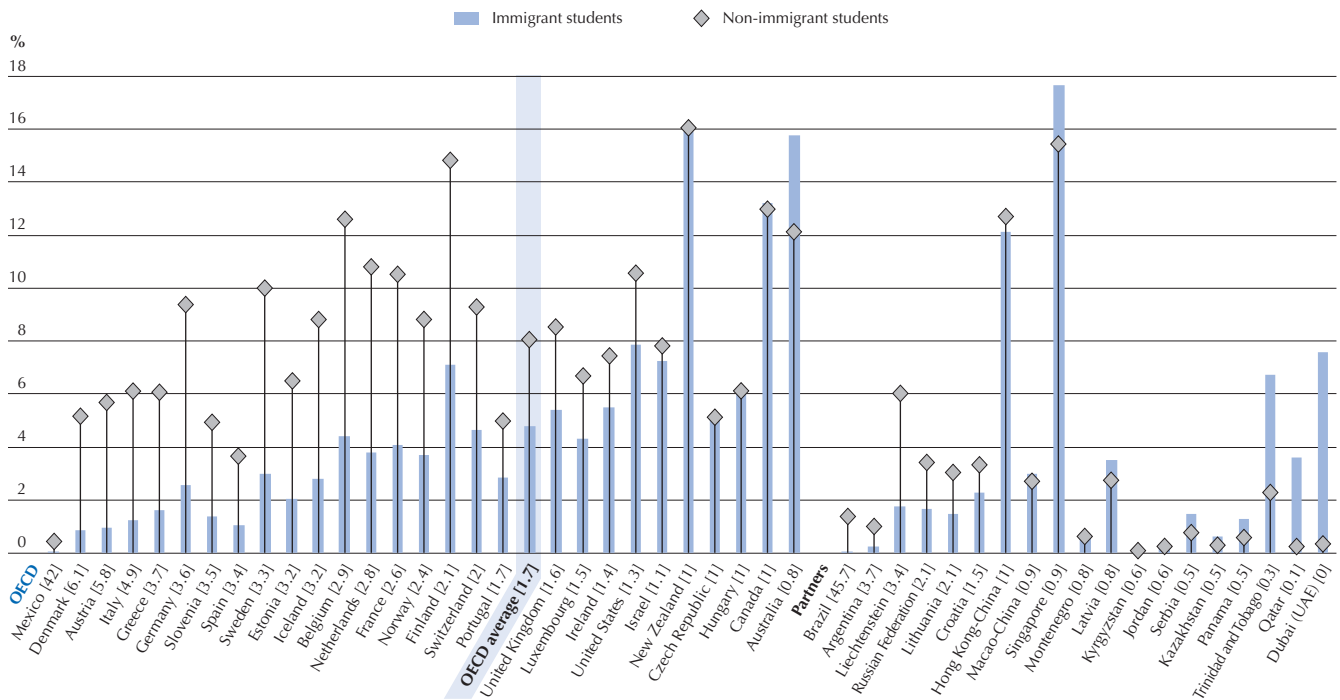
Source: Table B2.1f.

As evident in Figure 2.4, skill inequality at the bottom of the distribution is not necessarily associated with the proportion of low performers among immigrant or non-immigrant students. For example, Finland and Canada have relatively few low performers among non-immigrant students, 7% and 9% respectively. Yet, the proportion of the lowest performers among immigrant students reaches 29% in Finland and it stands at 11% in Canada. In general, low proportions of the lowest performers among immigrant students are associated with lower skills inequality at the bottom of the distribution. However, there are countries with average proportions of low performers among immigrant students where this measure of inequality is still high. For example, Finland, Denmark, Belgium, Sweden, Switzerland, Norway, Spain and Germany have relatively average proportions of the lowest performers among immigrant students, but skill inequality at the bottom of the distribution is well above the OECD average of 1.9.

In Figure 2.5 systems are ranked according to skill inequality across immigrant background at the top of the distribution. Across the OECD the proportion of top performers among non-immigrant students is 1.7 times as large as the proportion among top performers among immigrant students. Top performers are less common among immigrant students in all OECD countries except Portugal, Ireland, the United States, Israel, New Zealand, the Czech Republic, Hungary, Canada and Australia, where there are no apparent differences. In no OECD country are top performers more common among immigrant students. Beyond the odd case of Mexico,[4] skill inequality at the top of the distribution is highest in Denmark and Austria where the proportion of top performers among non-immigrant students is respectively 6.1 times and 5.8 times larger than the proportion of top performers among immigrant students. The ratio is also above 3.1 in Italy, Greece, Germany, Slovenia, Spain, Sweden, Estonia and Iceland (Table B2.1e).

■ Figure 2.5 ■

Skills and knowledge inequality across immigrant background at the top of the performance distribution, top performers by immigrant background

Note: Relative risk of top performance for immigrant students is indicated in brackets next to the country names.

Countries are ranked in descending order of the relative risk of top performance for immigrant students.

Source: Table B2.1e.

Figure 2.5 shows that a high proportion of top performers among immigrant students is related to lower inequality across immigrant background at the top of the distribution. Finland is the only OECD country where the proportion of top performers among immigrant students is at or above the OECD average of 5% and the proportion of top performers among non-immigrant students are well above twice that at 15%. And in a number of OECD countries – Germany, Sweden, Iceland, Belgium, Netherlands, France, Norway and Switzerland – the proportion of top performers among non-immigrant students is at or above the OECD average of 8% but the proportion of top performers among immigrant students is 4% or less.

Considering both inequality at the top and bottom of the distribution across immigrant background, Austria, Denmark, Italy and Finland stand out as countries with high inequality at both ends of the distribution scale. While in Finland the inequality is more marked at the bottom, in Austria, Denmark and Italy, it is more marked at the top. Other countries with high inequality at the top and bottom are Iceland, Germany, Sweden, Greece, Spain, Belgium, France, Norway and Switzerland. Luxembourg is the only country where inequality is average at the top and high at the bottom. In Slovenia, Estonia, and the Netherlands inequality is high only at the top but it is only average at the bottom. Inequality is low both at the top and the bottom in Hungary, Australia, Israel and Canada. In New Zealand and the Czech Republic it is below average, particularly at the top. In the United States, the United Kingdom and Portugal inequality is average at the top and low at the bottom.

Knowledge and skills disadvantage among first- and second-generation students

Average performance

Across OECD countries, non-immigrant students outscore both first- and second- generation students, but the knowledge and skills disadvantage tends to be greatest among first-generation students. Canada and the Czech Republic are the only OECD countries where there are no differences based on students' immigrant background. Immigrant students represent almost a quarter of Canada's student population assessed in PISA 2009, while they account for only about 2% in the Czech Republic (Table B1.3).

In no OECD country do first-generation students outperform non-immigrant students. Non-immigrant students outscore first-generation students in 23 out of 28 OECD countries with sufficient data (Table B2.1a).

■ Figure 2.6 ■
Performance disadvantage of first- and second-generation students
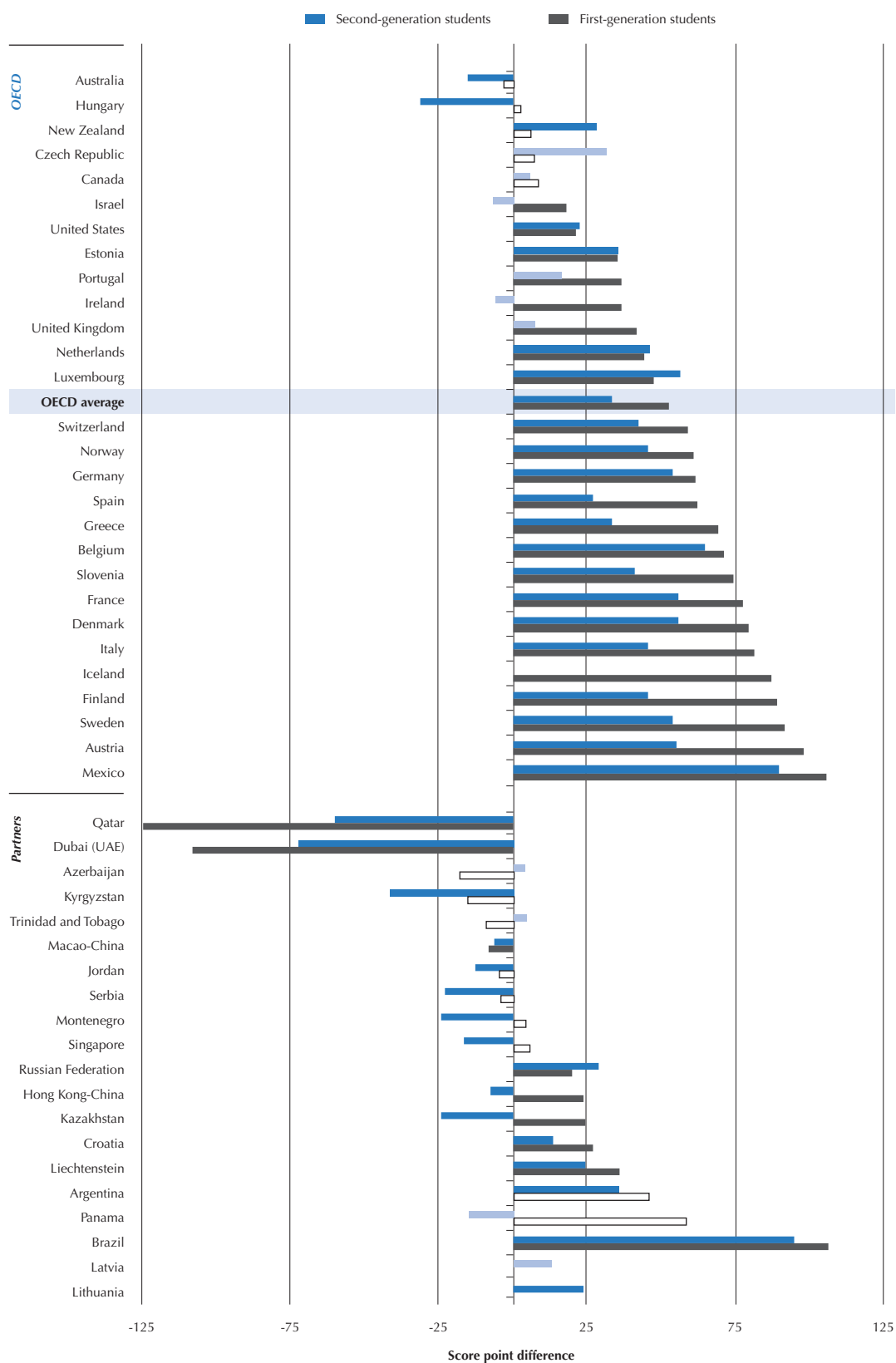
Note: Score point differences that are statistically significant are shown in a darker tone.

Countries are ranked in ascending order of score point differences in reading performance between non-immigrant students and first-generation students.

Source: Table B2.1a.

Non-immigrant students outperform second-generation students in 19 out of 27 OECD countries with sufficient data. Only in New Zealand do first-generation students outscore second-generation students (Table B2.1a). In Hungary and Australia, second-generation students outscore non-immigrant students. In Australia, immigrant students account for 23% of the student population assessed in PISA 2009, while they represent only 2% of that population in Hungary (Table B1.3).

In most cases, the knowledge and skills disadvantage among first-generation students is large. Figure 2.6 displays the performance differences between non-immigrant students and first- and second-generation students across all countries with sufficient data. In Mexico, the gap between non-immigrant and first-generation students reaches 105 score points on the PISA reading scale. This difference is larger than 90 points in Sweden and Austria and it is above 80 points in Italy, Iceland and Finland. In contrast, there are no apparent performance differences between non-immigrant students and first-generation students in Australia, Hungary, New Zealand, the Czech Republic and Canada (Table B2.1a).

The knowledge and skills gap among second-generation students tends to be narrower than among first-generation and non-immigrant students, but in most cases it remains noticeable. In Mexico, it is close to 90 score points on the PISA reading scale. In Belgium, the gap is more than 64 score points or the equivalent of a year and a half of schooling. And in Sweden, Germany, Austria, France, Denmark and Luxembourg, non-immigrant students outperform second-generation students by more than 50 score points in reading. In contrast, in Hungary and Australia, second-generation students outscore non-immigrant students by 32 and 16 score points, respectively. Ireland, the United Kingdom, Israel, Portugal, the Czech Republic and Canada are the only OECD countries where there are no performance differences between non-immigrant students and second-generation students. In Canada and the Czech Republic this is coupled with no differences between first-generation students and non-immigrant students (Table B2.1). Beyond their different size, the immigrant population in the Czech Republic and that in Canada are peculiar and cannot be easily compared.

With some important exceptions, the larger the knowledge and skills disadvantage of first-generation students, the larger the disadvantage for second-generation students. For example, second-generation students outscore first-generation students by more than 42 score points, or the equivalent of one school year, in Finland, Austria and Ireland.

SOCIO-ECONOMIC DISADVANTAGE AMONG IMMIGRANT STUDENTS

Lower levels of knowledge and skills are not the only impediments to success at school among immigrant students. Socio-economic disadvantage, which is common among these children, is closely associated with lower performance in PISA across the board. This disadvantage only partly explains the poorer performance among immigrant students. In many cases, the disadvantage in knowledge and skills remains even after accounting for socio-economic background and language spoken at home.

Student socio-economic background in PISA

Student socio-economic background in PISA is measured by the *index of economic, social and cultural status*, which is a composite index of various measures. PISA 2009 Results (OECD, 2010) contains a detailed description of how the index is constructed. The main components are: a measure of parental education (the highest educational attainment of either the father or the mother), a measure of parental occupation (the highest parental occupational status) and a measure of home possessions (including wealth, educational and cultural possessions and the number of books at home). Tables B2.2a through B2.2g explore each of these components and their subcomponents by immigrant background and provide a rich picture of differences across students from different backgrounds.

In no OECD country do immigrant students enjoy a socio-economic advantage over non-immigrant students. In the Czech Republic, Portugal, Estonia, Australia, Hungary, New Zealand and Ireland, there are no overall differences in socio-economic background between immigrant students and those without. In the other 21 of 28 OECD countries with sufficient data, immigrant students are more socio-economically disadvantaged than non-immigrant students (Table B2.2a).

The socio-economic disadvantage of immigrant students is illustrated by differences in parental education and in particular in the education of the mother. In some instances in this report, the mother's education is chosen as a proxy of socio-economic background because it provides a good approximation to the educational system of the origin country for many immigrant students. It also provides an intuitive approach to socio-economic background, which may prove helpful when designing education, immigration or other social policies. Across OECD countries, highest parental educational attainment reaches 13.4 years of education among non-immigrant students and 12.9 among immigrant students (Table B2.2b). These averages and their slight difference mask wide variation across countries. The difference in years of education is largest in Luxembourg, the Netherlands and the United States where it reaches two years or more. In Iceland, Finland, Greece, Israel, United Kingdom, Italy, the Czech Republic, Spain, Hungary and Canada there is no apparent difference. While in Australia, Estonia, New Zealand, Ireland and Portugal the gap is reversed and immigrant students have higher average parental educational attainment than non-immigrant students. Average parental attainment among immigrant students is highest in Canada, where it reaches 15.0 years, and it is lowest in Mexico, where it is less than 9.5 years.

In practice, however, it is the formal educational qualification levels which mediate how individuals are perceived by employers and social actors and their access to different types of employment. In this respect, formal maternal educational attainment provides a particularly good approximation to the socio-economic disadvantage of immigrant students. Low maternal education is defined here as educational attainment up to lower secondary education. Figure 2.7 shows the proportion of students whose mother's educational attainment does not reach beyond lower secondary education, here referred to as students with low maternal education. Countries are ranked according to a measure of inequality across immigrant background, the ratio of the proportion of immigrant students with low maternal education to that of non-immigrant students: The higher the ratio, the bigger the gap between these two groups.

Figure 2.7 shows that in general the proportion of students with low maternal education is higher among immigrant students than among non-immigrant students. Across most OECD countries secondary education has been practically universal since the 1980s and this is reflected in the educational attainment of the mothers of non-immigrant students. However, many immigrant students have mothers who were educated elsewhere and whose educational attainment is low, sometimes even below lower secondary education.

▪ Figure 2.7 ▪
Proportion of students with low maternal education, by immigrant background
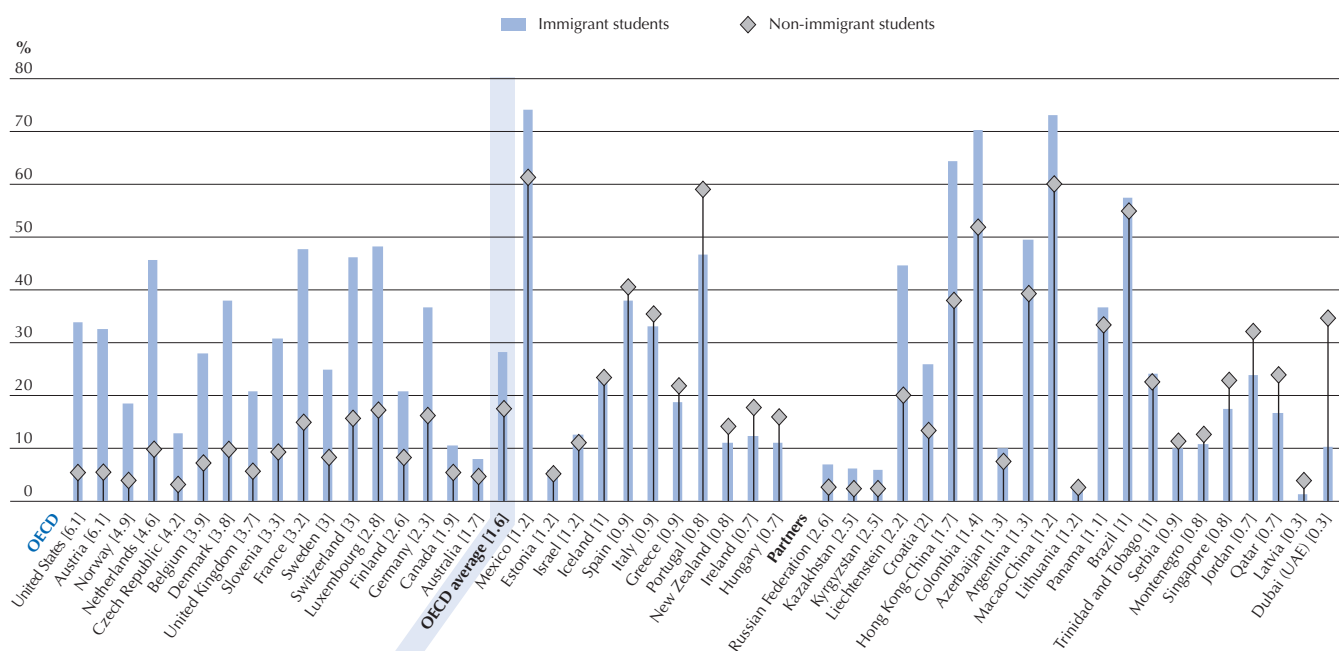
Note: Relative risk of students with low maternal education is indicated in brackets next to the country names. The relative risk is the proportion among immigrant students divided by the proportion among non-immigrant students.

Countries are ranked in descending order of the relative risk of low maternal education for immigrant students – the proportion of students with low educated mothers among non-immigrant students divided by the proportion of students with low educated mothers among immigrant students.

Source: Table B2.2i.

The inequality of maternal education is most marked in the United States and Austria, where the proportion of immigrant students with low maternal education is more than six times as large as among non-immigrant students. In Norway, the Netherlands and the Czech Republic, it is more than 4 times as large. In these countries, the migrant population is very different from the population of students whose parents were born in the country of assessment and it has undoubtedly posed a significant challenge to the education system.

In absolute terms, the proportion of immigrant students with low maternal education is particularly high in the Netherlands, France, Switzerland and Luxembourg where more than 40% of immigrant students have mother with low education. The only two other cases with similarly high proportions of low maternal education are Mexico and Portugal but in both cases, particularly in Mexico, non-immigrant students also have low levels of average maternal education (Table B2.2i).

■ Figure 2.8 ■
Proportion of students with low maternal education, by immigrant status
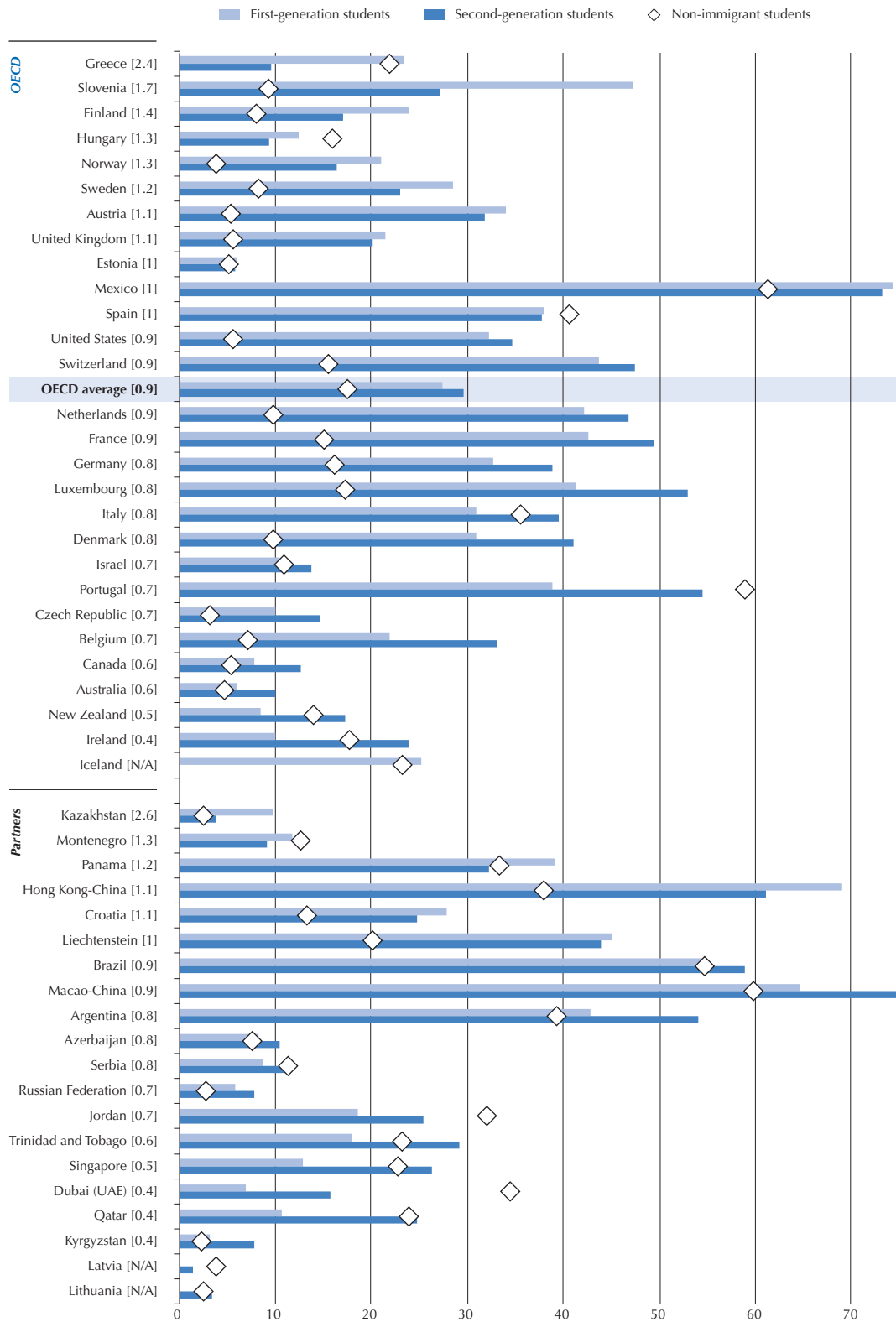
Note: Relative risk of students with low maternal education is indicated in brackets next to the country names. The relative risk is the proportion among immigrant students divided by the proportion among non-immigrant students.

Countries are ranked in descending order of the relative risk of low maternal education for immigrant students – the proportion of students with low educated mothers among non-immigrant students divided by the proportion of students with low educated mothers among immigrant students.

Source: Table B2.2i.

DO DIFFERENCES IN SOCIO-ECONOMIC BACKGROUND ACCOUNT FOR THE DISADVANTAGE IN KNOWLEDGE AND SKILLS?

Socio-economic background and performance are closely related. Given that the immigrant students are socio-economically disadvantaged, it is possible that their knowledge and skills disadvantage is, to a large extent, a reflection of their socio-economic disadvantage. To evaluate this hypothesis, one can compare their performance with similarly disadvantaged non-immigrant students. The change in the performance gap before and after accounting for socio-economic background gives an approximation to the extent to which differences in student performance across immigrant background are associated with differences in socio-economic background. Although controlling for socio-economic background may statistically reduce the scale of the measured score difference between immigrant students and children of the native-born, the socio-economic disadvantage itself of course does not disappear, nor does the performance gap and its downstream consequences on schooling and labour market prospects.

Immigrant students

Across the OECD the performance gap between immigrant students and non-immigrant students diminishes from 44 to 27 score points after adjusting for socio-economic background, a reduction of 16 score points or more than a third of the initial disadvantage. However, the performance advantage of non-immigrant students remains in 21 out of 28 OECD countries with sufficient data (Table B2.1a).

Comparing students of similar socio-economic background reduces the performance differences across immigrant background but the Netherlands is the only country where the performance gap across immigrant background vanishes after adjusting for socio-economic background. The gap is halved in Luxembourg, Germany and France. In Slovenia, Austria, Denmark and Switzerland the performance gap is reduced by more than 40%. Finland, Mexico, Portugal and Estonia are the only OECD countries where the reductions are less than 15% of the initial disadvantage.

A few countries deviate from the general pattern of persistent performance disadvantages. In Australia, Israel and the United States, after comparing students of similar socio-economic background, immigrant students perform better than non-immigrant students but the gap is small: the widest is in Australia with 11 score points. The United States is the only case where there is a reversal in the direction of the gap after adjusting for socio-economic background. In Canada, the Czech Republic and Hungary there is no performance gap associated with immigrant background before or after adjusting for socio-economic background.

Second-generation students

Second-generation students face an important socio-economic disadvantage but their performance disadvantage with non-immigrant students was narrower than for first-generation students. Adjusting for socio-economic background, the performance disadvantage remains but it is almost halved across the OECD – it is reduced from 33 to 18 score points or a 46% reduction of the initial disadvantage equivalent to 15 score points (Table B2.1a).

Only in the United States and the Netherlands does the observed performance difference disappear after adjusting for socio-economic background. Out of the 27 OECD countries with enough data, there are 18 countries where the performance disadvantage of second-generation students remains after adjusting for socio-economic background. Among these countries, the narrowing of the gap is largest in Luxembourg, where socio-economic differences are associated with more than two thirds of the performance disadvantage of second-generation students. In Germany, Slovenia, France, Switzerland, Austria and Denmark, the gap is more than halved. In contrast, the gap is reduced by less than a third in Spain, Mexico, Finland and Estonia.

A number of countries diverge from this general pattern. In Australia second-generation students perform better than non-immigrant students and this advantage persists after adjusting for socio-economic background. In Hungary, there is no difference after adjusting for socio-economic background, while second-generation students outperformed non-immigrant students without the adjustment. In Canada, the United Kingdom, Ireland, the Czech Republic and Portugal there is no performance difference between second-generation students and non-immigrant students before or after adjusting for socio-economic background.
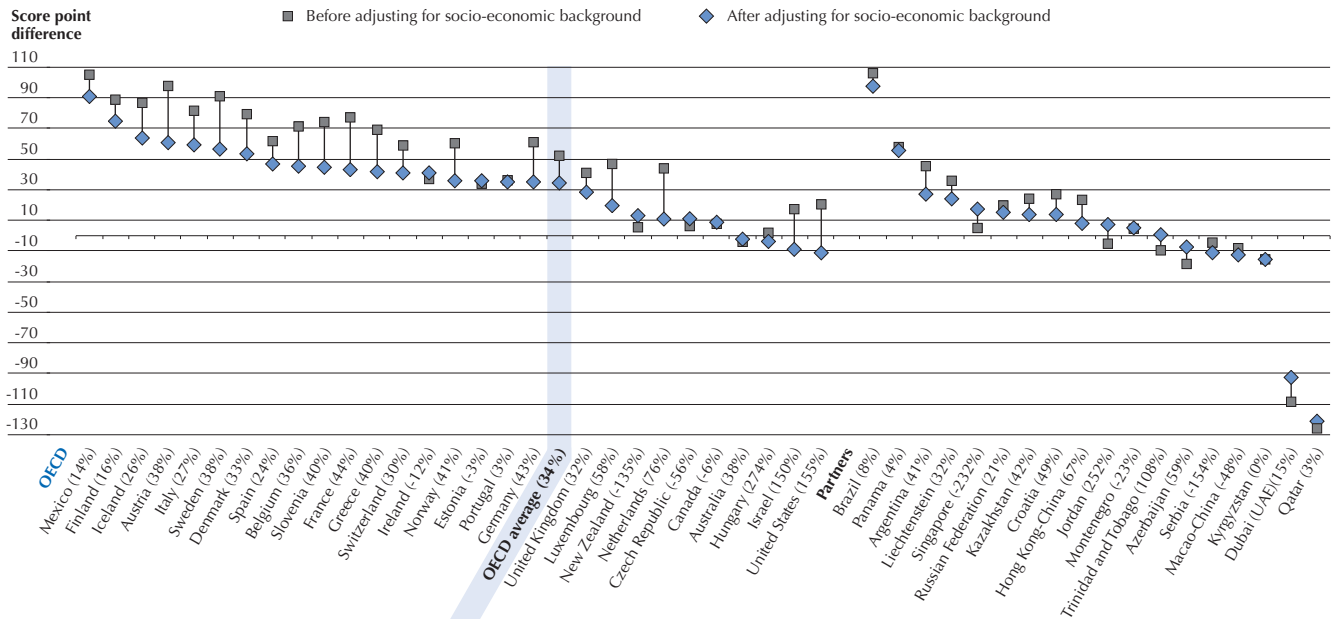
First-generation students

First-generation students face a large performance disadvantage in 22 out of 28 OECD countries with enough data even after adjusting for socio economic background (Table B2.1a). Figure 2.9 displays the performance disadvantage between first-generation students and non-immigrant students. Countries are ranked by the number of score points the disadvantage narrows after adjusting for socio-economic background.

Figure 2.9 shows that the performance disadvantage of first-generation students persists after adjusting for socio-economic background, but it is substantially reduced in many cases. Across the OECD, the underperformance of first-generation students when compared with non-immigrant students is reduced from 52 to 35 score points, a reduction of some 17 score points or about a third of the initial disadvantage (Table B2.1a).

■ Figure 2.9 ■
Performance gap between non-immigrant students and first-generation students before and after accounting for socio-economic background

Note: In parenthesis, the change in the performance gap after adjusting for socio-economic background as a proportion of the performance gap before adjusting for socio-economic background.

Countries are ranked in descending order of the score point differences in reading performance between non-immigrant students and first-generation students, after accounting for socio-economic background.

Source: Table B2.1a.

Adjusting for socio-economic background eliminates the performance difference in the United States, Israel and the Netherlands. Among the 22 countries where the disadvantage persists, the narrowing of the disadvantage is greatest in Luxembourg, where it is more than halved. In France, Germany, Norway, Slovenia and Greece the gap is narrowed by more than 40% of the initial disadvantage. In contrast, the gap is narrowed by less than a quarter of the initial disadvantage in Spain, Finland, Mexico and Portugal. In Ireland and Estonia the gap widens by a small margin. In Canada and New Zealand adjusting for socio-economic background widens the gap and makes it noticeable. While there was no apparent difference before adjusting for socio-economic background between first-generation students and non-immigrant students, after the adjustment a small but significant disadvantage for first-generation students becomes apparent in both countries (Table B2.1a).

Hungary, Australia and the Czech Republic are the only cases in the OECD where there is no performance disadvantage for first-generation students before or after adjusting for socio-economic background.

## HETEROGENEITY IN KNOWLEDGE, SKILLS AND SOCIO-ECONOMIC BACKGROUND

A more diverse student population presents challenges for education systems. The immigrant students are often socio-economically disadvantaged and are unfamiliar with the language of instruction. Their knowledge and skills at age 15 reflect these deficits, but the performance of immigrant students still lags behind that of students from similar socio-economic backgrounds. However, the gap between these two groups is far from uniform across countries, as is also the diversity of immigrant populations. Indeed, the immigrant students form a relatively heterogeneous group when compared with non-immigrant students. Could this diversity be related to the performance gap between immigrant students and children of the native-born? This section evaluates the evidence in PISA on heterogeneity along two lines: knowledge and skills, and socio-economic background.

Figure 2.10 displays the relationship between the average performance difference between immigrant and non-immigrant students (on the vertical axis) and the dispersion of socio-economic background across immigrant students. While there are important exceptions to this pattern, the general pattern is that greater differences in performance are associated with immigrant populations of more diverse socio-economic backgrounds.

Beyond their disadvantaged socio-economic background, the main characteristic of the population of non-immigrant students is its diversity.
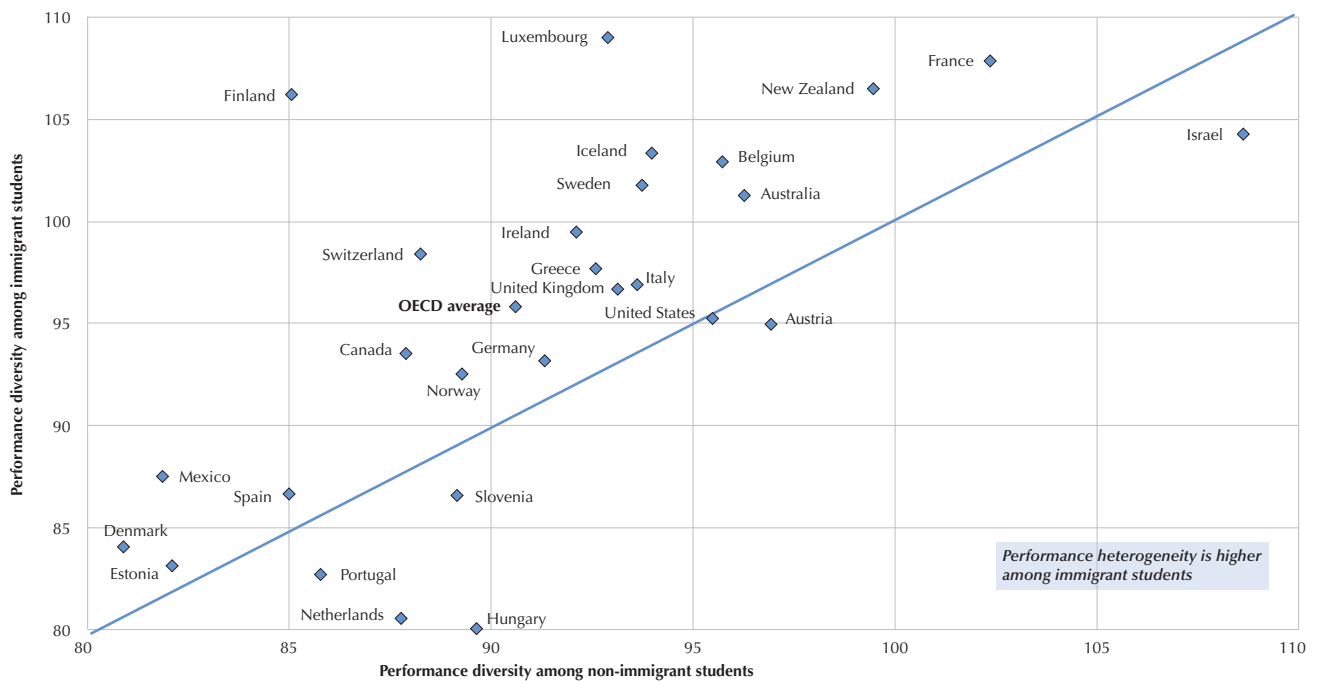
■ Figure 2.10 ■

The knowledge and skill disadvantage among immigrant students and diverse socio-economic status
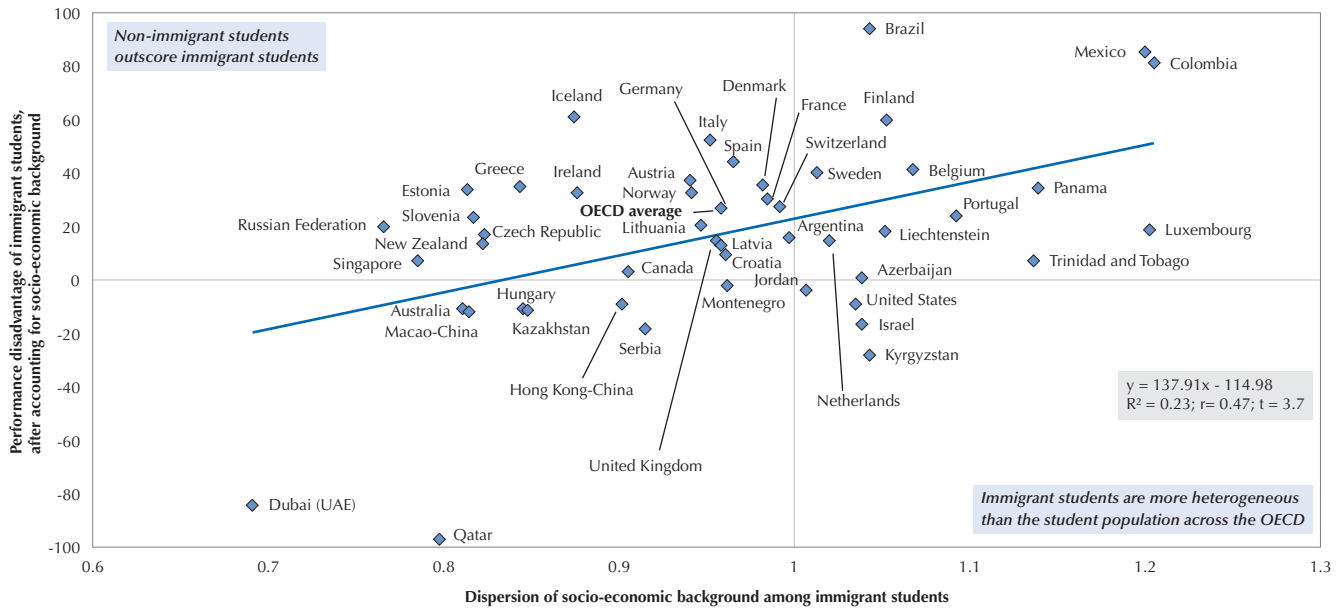
Source: Tables B2.1a. and B2.5.

■ Figure 2.11 ■

Performance dispersion among students with and without an immigrant background across OECD countries

Source: Table B2.3a.

Performance heterogeneity of immigrant students

Measures of dispersion: Standard deviation of performance

In most OECD countries, diversity among immigrant students is most evident in the dispersion of knowledge and skills within this group. Not only do these students face a disadvantage in knowledge and skills, but some of them are at a much greater disadvantage than others. Dispersion within a group is measured by the standard deviation of performance among students sharing a particular characteristic, in this case performance in reading.

In general, the performance dispersion is wider among immigrant students than among non-immigrant students. Minimum educational standards across OECD educational systems introduce a large amount of inter-generational progress. In other countries, these minimum standards may not exist and some may not have even completed primary school.

Figure 2.11 displays the performance dispersion among immigrant and non-immigrant students across OECD countries. For example, the dispersion of performance among non-immigrant students in the typical OECD country is 90 score points on the PISA reading scale.[5] Such a dispersion implies that in the typical OECD country, the difference between the 15% of students with the lowest scores and the 15% with the highest scores is 90 score points. Only in Hungary, Slovenia, the Netherlands, Portugal, Spain, Estonia, Mexico and Denmark do immigrant students show a performance dispersion lower than 90 score points. In all other countries, the dispersion among immigrant students is about the same or much higher (Table B2.3a).

With some important exceptions, the wider the performance dispersion among non-immigrant students, the wider the performance dispersion among immigrant students. For example, in Finland and Luxembourg, dispersion among immigrant students is above 105 score points – well above the OECD average of 95 score points, and similar to that in New Zealand and France (both of which show wide performance dispersions among immigrant and non-immigrant students). Yet in Finland, the performance dispersion among non-immigrant students – 85 score points – is among the lowest across OECD countries, similar to the level found in Spain. And in Luxembourg, the performance dispersion among non-immigrant students is close to that of a typical OECD country (Table B2.3). This result suggests that performance dispersion is country-specific and thus depends in part on national policies.

■ Figure 2.12 ■
Inter-quartile range of performance, by immigrant background
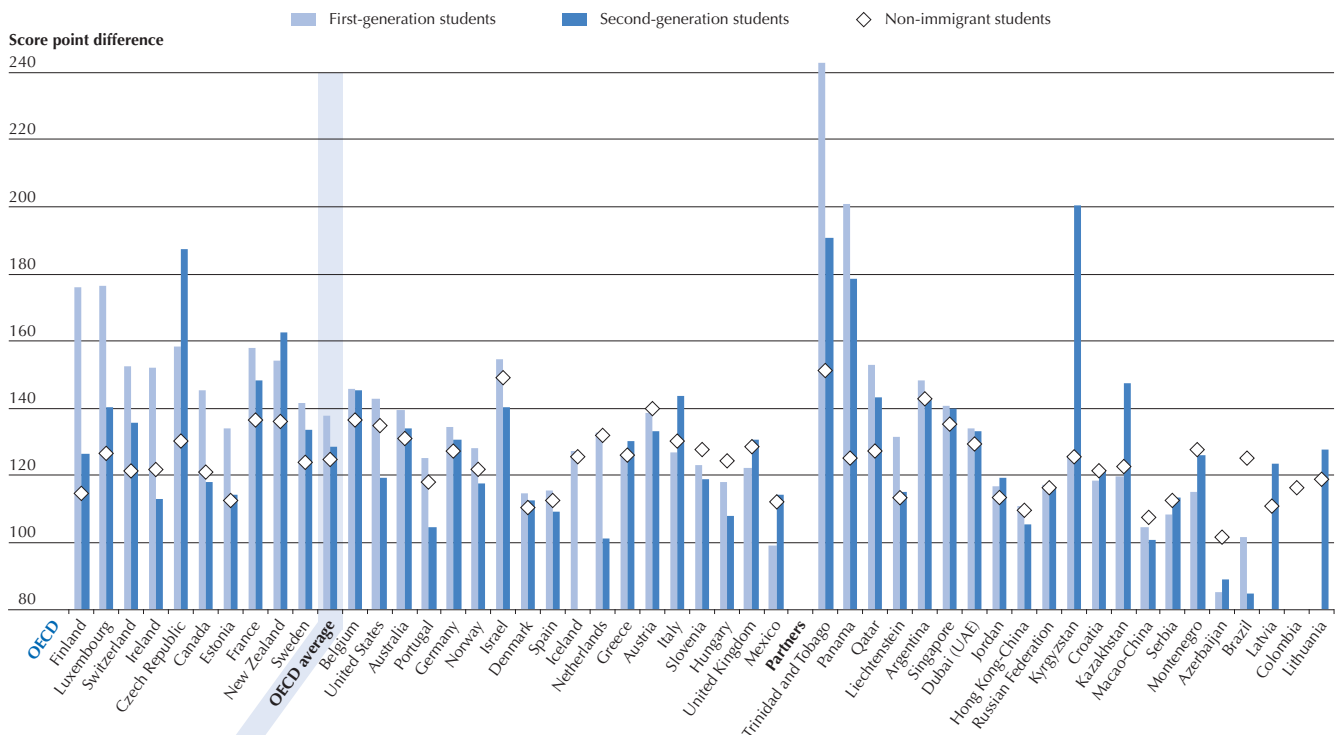
Note: The interquartile range of performance refers to the difference between the 75th and the 25th percentile of the performance in the reading scale.

Countries are ranked in descending order of the difference in the interquartile range of performance between first-generation students and non-immigrant students.

Source: Table B2.4.

Groups of students sharing common characteristics, such as country of birth, are generally less diverse. The largest performance dispersion is therefore observed among first-generation students, whose country of origin is not necessarily the same. Second-generation students were born in the country of assessment but their parents were born abroad and not necessarily in the same country as the parents of other second-generation students. First-generation students are more diverse than second-generation students, who are, in turn, more diverse than non-immigrant students (Table B2.3).

Figure 2.12 provides the inter-quartile range of performance across immigrant background, distinguishing between first and second-generation students. The inter-quartile range of performance among a particular group of students is defined as the difference between the 75th percentile of performance (above which only 25% of students in this group score) and the 25th percentile of performance (below which only 25% of students in this group score). It provides a different perspective into how diverse performance is within a particular group of students.

Across the OECD, the inter-quartile range of performance among non-immigrant students reaches 125 score points, smaller than among immigrant students (133 score points). The inter-quartile range of performance is larger among first-generation students (138 score points) than among second-generation students (129 score points). In Figure 2.12 countries are ranked according to the difference between the inter-quartile range of first-generation students and that of non-immigrant students. The difference is largest in Finland, Luxembourg, Switzerland, Ireland, Czech Republic, Canada, Estonia, France, New Zealand and Sweden among OECD countries and it is only reversed by more than 10 score points in Mexico. The Czech Republic and New Zealand are the only countries in this group where the inter-quartile range is even larger among second-generation students (Table B2.4).

Figure 2.12 highlights some important deviations from this general pattern. In Ireland and Canada, the inter-quartile range is high for first-generation students but not for second-generation students, relative to non-immigrant students. In the United States, Portugal, the Netherlands and Hungary, the inter-quartile range is small for second-generation students, but not so for first-generation students (Table B2.4).

Socio-economic heterogeneity of immigrant students

Differences in performance heterogeneity across immigrant backgrounds are relatively limited when compared with differences in socio-economic heterogeneity. The *PISA index of economic, social and cultural status* is constructed so that the dispersion in socio-economic background across all OECD students is one. Within-country socio-economic dispersion is naturally smaller; for example, it is equal to 0.87 in the typical OECD country among non-immigrant students. Figure 2.13 plots the differences in dispersion in socio-economic background according to immigrant background.

The differences are starker among first-generation students, but they are marked in practically all OECD countries. Across the 27 OECD countries with sufficient data, only second-generation students in Greece and Mexico appear to have a more homogeneous distribution of socio-economic background than non-immigrant students. In 17 countries, the opposite is true; and there appears to be no difference in Hungary, Spain, Ireland, Austria, Portugal and Estonia. Only in Hungary, Greece, Portugal, Spain and Italy are first-generation students more homogenous in socio-economic background than non-immigrant students. In 21 of 28 OECD countries with sufficient data, first-generation students form a more heterogeneous group of students than non-immigrant students. In Mexico, Iceland, New Zealand, Slovenia and Ireland there appears to be no difference in heterogeneity between these two groups of students (Table B2.5).

Not only are differences in socio-economic dispersion across immigrant background clearly seen in most OECD countries, they are also rather large. The dispersion of socio-economic background among immigrant students appear to be widest for first-generation students. For example, socio-economic dispersion in Sweden, Austria and Luxembourg among immigrant students stands at 1.01, 0.94 and 1.20 respectively, while for non-immigrant students, socio-economic dispersion stands at 0.76, 0.77 and 0.84, respectively (Table B2.5).

Across countries, socio-economic dispersion is associated with lower mean performance and larger performance gaps in favour of non-immigrant students. Countries where immigrant students come from more diverse socio-economic backgrounds are also those where the difference in reading performance is greater when comparing those students with non-immigrant students who have a similar socio-economic status.

However, socio-economic diversity is only part of the story. The proportion of immigrant students is actually negatively related to performance gaps in reading. Figure 2.14 shows the relationship between the proportion of immigrant students and performance gaps. Countries with larger populations of immigrant students are characterised by smaller performance differences between immigrant and non-immigrant students, after adjusting for socio-economic background. These examples show that it is possible to successfully integrate large proportions of immigrant students and reduce the performance differences between immigrant and non-immigrant students even when the size of the immigrant student population is considerable.

■ Figure 2.13 ■

Relative socio-economic dispersion among immigrant students across OECD countries

**Second-generation students**

First-generation students
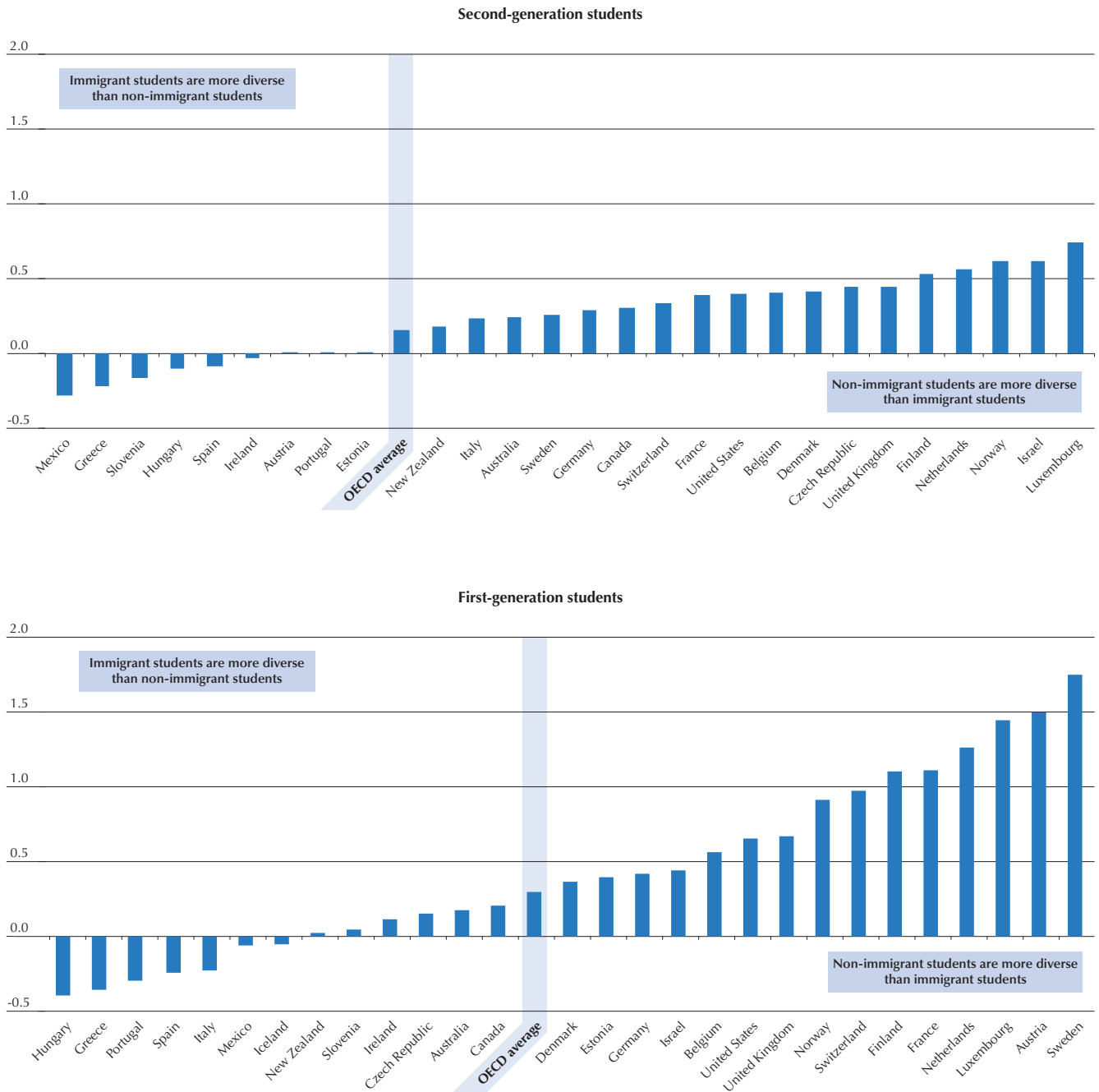
Note: Relative diversity is defined as the ratio of the variance in socio-economic background in the group of immigrant students (e.g. first generation students) to the variance of socio-economic background in the group of non-immigrant students (e.g. in the same case as before, non-immigrant students) minus one. If both variances are equal, the relative diversity so defined would be zero.

Countries are ranked in ascending order of the relative diversity of immigrant students.

Source: Table B2.5.

■ Figure 2.14 ■

Prevalence, relative socio-economic dispersion, and knowledge and skills disadvantage among immigrant students across OECD countries
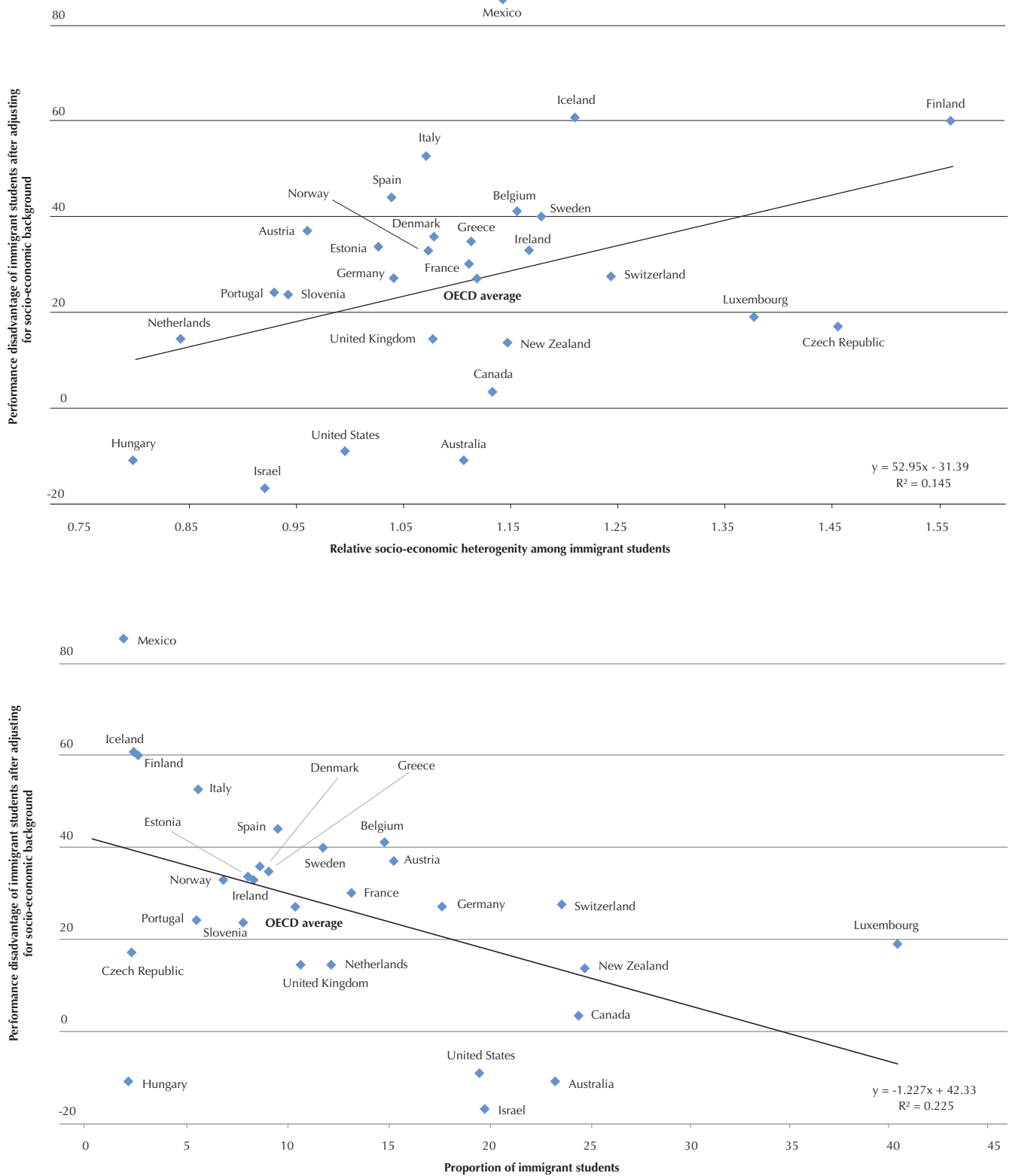
Source: Tables B1.3 and B2.1a.

TRENDS BETWEEN PISA 2000 AND PISA 2009

Between PISA 2000 and PISA 2009, most OECD countries achieved performance improvements among immigrant students by reducing performance dispersions within this group. Yet these changes are marked in only a small number of countries. Figure 2.15 plots changes in performance and performance dispersion between 2000 and 2009 among immigrant students across OECD countries. Among these countries, the average performance of immigrant students improved in Switzerland, Belgium and Germany by 37, 35 and 32 score points, respectively, on the PISA reading scale.[6] These are important improvements, close to the equivalent of a year of schooling (Table B2.6a). Among partner countries and economies, average performance also improved in Liechtenstein (61 score points) and in Hong Kong-China (10 score points). In contrast, the average performance of immigrant students declined in Ireland (79 score points), Italy (31 score points), Spain (27 score points) and Sweden (24 score points).

■ Figure 2.15 ■
Changes in performance and dispersion among immigrant students across OECD countries between 2000 and 2009

Source: Tables B2.6a and B2.6b.

In Germany, Sweden and the partner country Liechtenstein, the improvement was accompanied by a greater homogeneity of performance among immigrant students, while in Ireland the decline in performance was coupled with an increase in the heterogeneity of performance among this group of students (Table B2.6b).

Only in Belgium was the improvement in performance mirrored by an improvement in the average socio-economic status of immigrant students; in the rest of the countries there were no noticeable changes in the socio-economic profile of the typical immigrant student. In Hong Kong-China, the average socio-economic status of immigrant students deteriorated, which makes the improvement in average performance even more impressive (Table B2.6c).

Among the countries where the average performance of immigrant students changed substantially, socio-economic diversity increased in Sweden and Hong Kong-China while it decreased in Spain (Table B2.6d).

First and second-generation students

Analysing country of birth across immigrant students reveals that some of these trends are in part the result of differences in the changes taking place across sub-populations of immigrant students. The general observation that improvements in average performance and lower dispersion go hand in hand is reinforced.

Figure 2.16 plots changes in mean socio-economic background, mean performance and dispersion of performance across country of birth for immigrant students as well as changes. To better appreciate country differences the extreme improvement in mean performance among first-generation students in the partner country Liechtenstein and the extreme decline among this group in Ireland have been excluded (Tables B2.6e and B2.6f).

▪ Figure 2.16 ▪

Changes in mean socio-economic background, performance and dispersion among immigrant students by country of birth

Figure 2.16a. Second-generation students
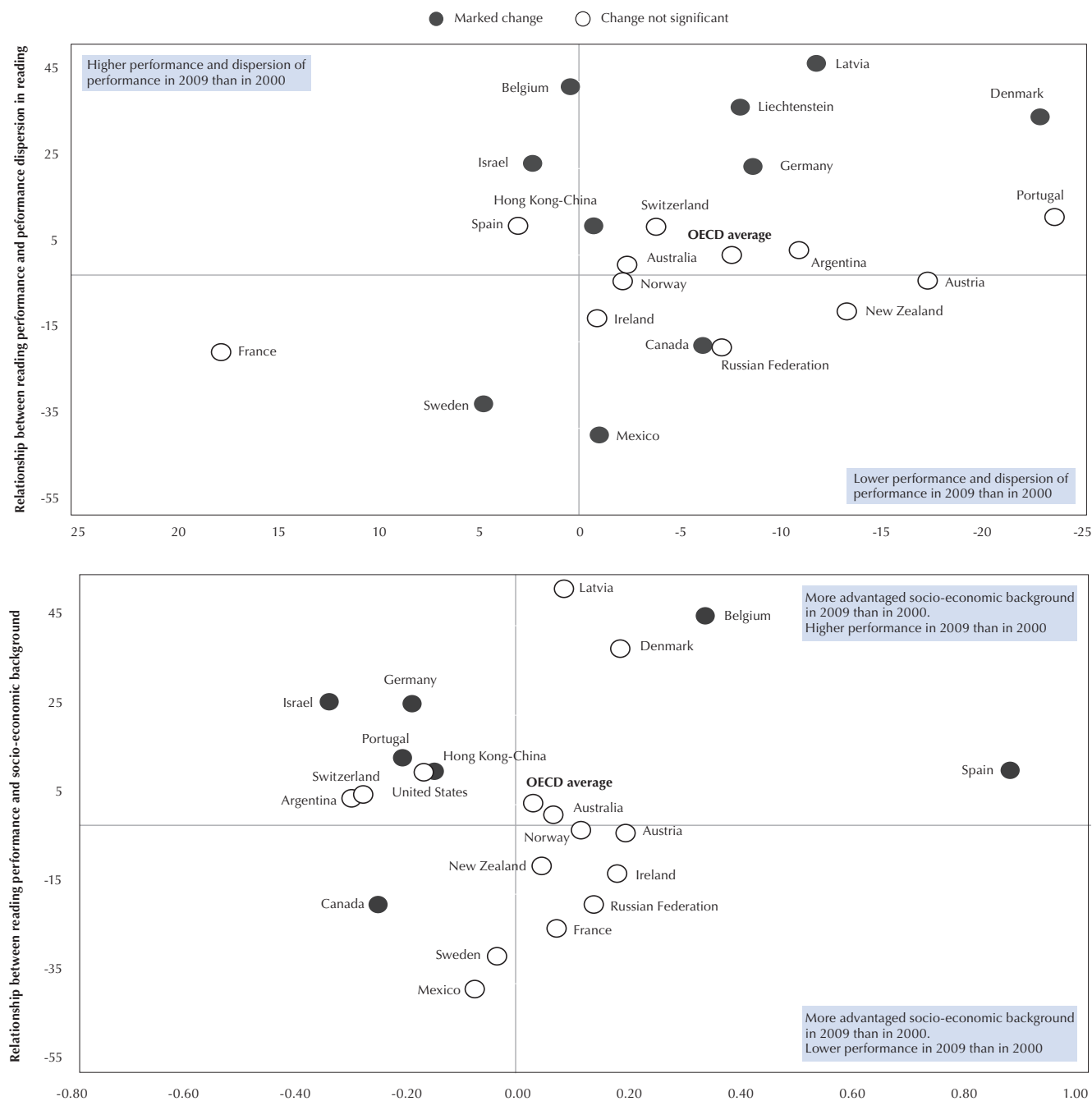
■ Figure 2.16 ■

**Changes in mean socio-economic background, performance and dispersion among immigrant students
by country of birth** *(continued)*

Figure 2.16b. First-generation students
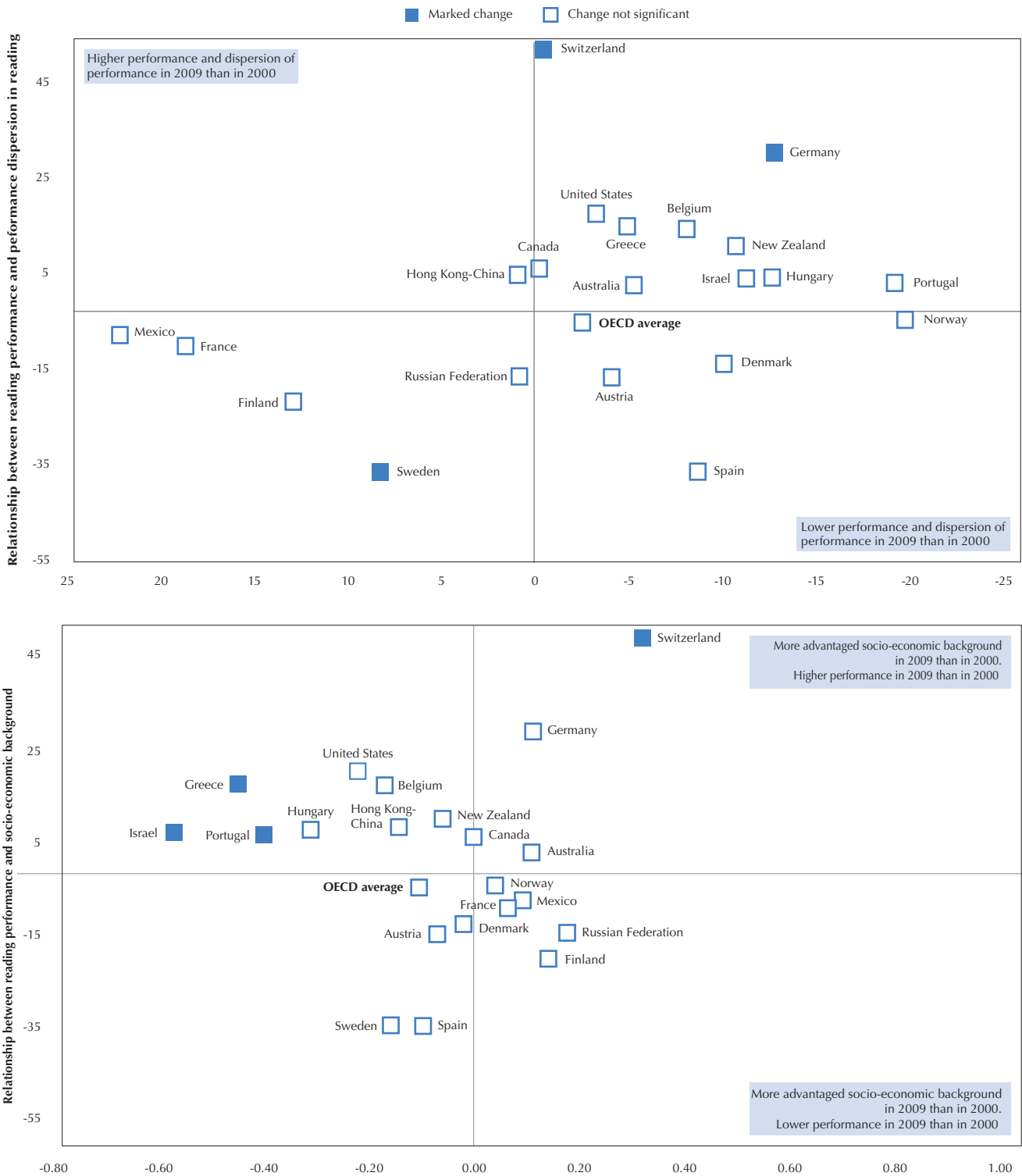
Note: Changes in mean performance and changes in mean socio-economic background that are statistically significant are shown in a darker tone.

Source: Tables B2.6f and B2.6e.

Figure 2.16 highlights general trends towards higher mean scores in PISA 2009 relative to PISA 2000 among second-generation students, where performance improved in Belgium, Denmark, Israel, Germany and the partner countries and economies Latvia, Liechtenstein and Hong Kong-China. Of these, only the performance improvement in Belgium is associated with an improvement in the mean socio-economic background. In Israel and Germany, the improvement in performance took place despite a decline in average socio-economic background. Second-generation students in Canada, Mexico and Sweden suffered a decline in average performance, associated with a decline in average socio-economic background only in Canada (Tables B2.6e and B2.6f).

Among first-generation students, only in Switzerland and Germany there are marked improvements and in the Swiss case they are associated with higher average socio-economic background (Tables B2.6e and B2.6f).

SUMMARY AND CONCLUSIONS

Designing policies that are effective in allowing all students to reach their potential requires that differences and similarities between immigrant and non-immigrant students be taken into account. While this chapter characterises those differences and similarities within and across countries, it also highlights the heterogeneity of immigrant student populations. Differences in the performance and profiles of immigrant students are associated with the varying degrees of success of educational systems in mitigating the performance differences among these students. The more diverse the immigrant student population, in absolute terms or relative to the non-immigrant student population, the greater the challenge of integrating these students will be.
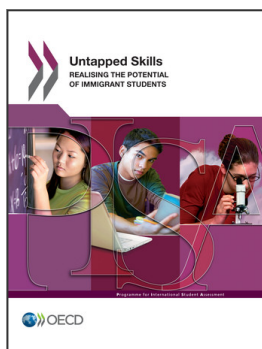
Notes

1. This report only includes estimates based on at least 30 students from five different schools. According to this criterion, the data on children of immigrants in Chile, Japan, Korea, Poland, the Slovak Republic and Turkey are not sufficiently reliable to be included in this report.

2. Albania, Bulgaria, Chinese Taipei, Colombia, Peru, Romania, Shanghai-China, Tunisia, Uruguay, Indonesia and Thailand are not included in this report because the student populations with an immigrant background in these countries and economies were not sufficiently large to produce reliable estimates.

3. The differences in Iceland are very large but the number of observations is very small, therefore it is not possible to say that the estimates are statistically different with a high degree of confidence.

4. In Mexico, the proportion of top performers across all students is very small and ratio of top performers is very high (because of the low number in the denominator).

5. Across all students in the OECD area, the dispersion in performance on the PISA 2000 reading scale was set to 100. Dispersion has not decreased; rather we are looking at the average dispersion across countries as a more appropriate benchmark. The entire OECD population is quite diverse, in it of itself; however the student population within each country is less diverse.

6. For an in-depth study of the performance changes in Switzerland see Cattaneo and Wolter (2012) and for Germany see Ehmke, et al. (2012).

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Ehmke, T., **P. Stanat** and **E. Klieme** (2012), "Erklärungsansätze für Veränderungen in der Lesekompetenz von PISA 2000 nach PISA 2009," *Zeitschrift für Pädagogik*.

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