Chapter 2
The choice of countries and regions

Some countries succeed in systematically outperforming others in terms of their educational attainments. The regions and countries studied in this book are selected based on results in the OECD PISA tests. These tests were launched in 2000 by the OECD as a triennial survey of 15-year-old students around the world. The PISA surveys assess the extent to which 15-year-old students have acquired knowledge and skills in science, reading, mathematics and collaborative problem solving (OECD, 2016).

The choice of the target population (15-year-olds) may be problematic, as in some countries such as Mexico or Turkey enrolment in this age is below 60 percent which makes the PISA tests’ outcomes not very informative about the whole of the education systems in these countries. Next to this participation bias, in certain countries, education is compulsory beyond the age of 15, meaning that some abilities of abstract reasoning are still in development at the time when the tests are taken. Therefore, the PISA tests may systematically underestimate the abilities of students in such countries. Furthermore, tests taken in different moments/ages might result in different outcomes (OECD, 2016; Wuttke, 2007).

In 2015, the area of focus of the PISA tests was science and about 540,000 (out of the population of approximately 29 million 15-year-olds in the schools) students coming from 72 countries were assessed. The best performing countries (Canada, Finland, Estonia, Japan, or Singapore) score about 520-560 points in science while the lowest performing (Algeria, Dominican Republic or Kosovo). score only about 330-380 points. To understand the extent of the difference in performance, it is good to point out that 40 points difference in scores is the equivalent of approximately one year of schooling (OECD, 2014 and 2016).

All the studied regions⁶ and countries in this book perform very strongly in PISA tests – specifically in science, which is the focus of the last OECD study. Figure 1 presents a comparison of the results in the chosen regions in the period from 2006 to 2015 and it also reveals regional differences. We observe that there is a decreasing trend in performance for all selected countries between 2006 and 2015 except for Canada and Estonia.

⁶ The regions that were chosen can be seen as countries as they have their own systems of education funding.
Canada ranks at position 8 in science in the test. And specifically British Columbia performs well above the OECD average in PISA tests, having the average score of 539 (see the comparison of all chosen regions in Figure 1). This is the highest score worldwide after Singapore, Quebec, and Alberta (The Council of Ministers of Education, Canada, 2016). The Canadian system shows overall very high levels of equity (De Witte and Hindriks, 2017). The impact of socio-economic status on student performance in mathematics is lower than the OECD average and students from an immigrant background perform similarly to their peers (OECD, 2015; De Witte and Hindriks, 2017).

Estonia ranks almost as highly as British Columbia and better than Canada or Finland, overall at position 3 in science when only countries are ranked. According to the OECD (2015a), Estonia generally promotes equity in the education system and the performance gap between students with a lower socio-economic background is lower than the OECD average in PISA 2012. The rate of secondary education attainment is among the highest among OECD countries as well as the proportion of adults holding a tertiary degree which shows high accessibility of education in Estonia (Santiago et al., 2016).
Finland ranks 5 among the tested countries and shows high levels of equity. However, it seems that in Finland students’ background and gender matter. Both boys and students with immigrant background are at higher risk of lower performance. According to PISA 2009 results in reading, boys scored 55 points fewer than girls (compared to the OECD average of 39 points). On the other hand, there is a large percentage of top performers and a small proportion of poor performers is lower than the OECD average. The impact of socio-economic status is also generally lower than the average among OECD countries. However, since 2000, the impact of socio-economic background has been increasing.

The state of Massachusetts (position 7) strongly outperforms other American states. From the statistical point of view, only Singapore (with a score of 556 points) performs in science significantly better than Massachusetts. Similarly, students in Massachusetts (with the score of 527 points) perform above the OECD and United States averages in reading. However, in mathematics, the United States as well as Massachusetts score below the OECD average. The score of the Massachusetts’ students in mathematics is close to the OECD average. Another signal about the quality of the education system in Massachusetts is that the average science performance declined between 2012 and 2015 across OECD countries. But in Massachusetts, the average science scores in 2012 and 2015 do not significantly differ (OECD, 2016c). On the other hand, the performance among students varies a lot. The variation in Massachusetts’ student performance in science (14 percent) is significantly higher than in Estonia, Finland or Canada (where the variation is less than 10 percent). The difference is attributed to differences in students’ socio-economic status, which explains about 11 percent of this variation according to OECD (2015d). This suggests that the level of equity in education is lower than in the aforementioned countries.

Across OECD countries, socio-economically advantaged students perform better than disadvantaged students (on average by 40 points which is equivalent to more than one year of schooling). The share of immigrants who are in the U.S. and are more likely to come from a disadvantaged background than the rest of the population is lower in Massachusetts than in the whole of the U.S. And after accounting for socio-economic status students, the differences in performance between the immigrant and non-immigrant population is no longer significant (OECDc, 2016).

Finally, in general, according to the OECD (2016), education systems that give school principals responsibility for school governance outperform other education system in science. This positive association7 becomes even

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7 Please note that this does mean that there is a causal relation between the responsibility given to school principals and the educational outcomes.
stronger in countries where mandatory standardized tests of students take place regularly. The performance of the chosen regions reassures us about this relationship as most of these high performing countries give large autonomy to the schools and school districts.

We discuss some particular features of the selected countries and regions next.

2.1 British Columbia

British Columbia has full responsibility for its own education funding. It is a bilingual province which aims to support English and French minority populations (OECD, 2015).

According to OECD (2015), Canada has had positive indicators on equity in recent years. And as it is a multi-cultural society with a large share of foreign-born population (almost 20 percent), it is interesting to note that native-born students and students with an immigrant background showed no statistically significant difference in performance in mathematics.

Another interesting feature of the system is the usage of supplements for unique geographic factors – specifically the small community supplement (British Columbia, Resource Management Division, 2016). We will extensively comment on this in the discussion of the funding formula as this might be a challenge faced by many policy makers.

2.2 Estonia

According to the results in PISA, Estonia has one of the strongest education systems among all OECD countries, with well above-average results (see Figure 1) (Santiago et al., 2016).

Moreover, for its size and population of 1.34 million Estonia has a large number of municipalities – 213 in 2017 (Statistics Estonia, 2017a). Although almost 70 percent of the population live in urban municipalities, over 85 percent (or 183 out of 213) of local governments – that manage, inter alia, schools – are rural. About 65 percent of the municipalities have fewer than 3,000 residents, with the smallest having as few as 105 (OECD, 2011). In the Estonian system, the smallest municipality (Piirissaare) has the responsibility to provide the same services as the largest one, Tallinn, with a population of over 407,000. This rural character and a large number of small municipalities and schools make Estonia an interesting case study.
2.3 Finland

The Finnish educational system is an example of a Nordic fully public-funded, inclusive system that traditionally performs very well in PISA rankings (for details, see Figure 1). The high level of inclusiveness and very good education outcomes make it a very interesting case study.

25 percent of schools have under 50 students and a large part of the country is rural in character. The funding system is heavily decentralized and decided by local authorities. The level of decentralization and very high performance make Finland an interesting case. We will focus on the formula for transfers to the municipalities and a case study from a chosen municipality.

2.4 Flanders

The Flemish Community of Belgium is the best performing community out of the three institutional communities of Belgium. It is particularly successful in reading skills and promoting a second language in education. In Flanders, school boards are granted funds from the central government and they then run schools while enjoying a greater level of autonomy in curriculum development.

2.5 Massachusetts

The U.S. students’ performance in PISA tests remained below or close to the OECD average. However, the state of Massachusetts outperforms other American regions. From a statistical point of view, only Singapore (with a score of 556 points in science) performs significantly better than Massachusetts. Similarly, students in Massachusetts (with a score of 527 points) perform above the OECD and United States averages in reading (OECD, 2016c). We will therefore analyze this state as it constitutes a good example of a federal state/region that outperforms the rest of the country in a heavily decentralized system.