SCHOOL FACTORS RELATED TO QUALITY AND EQUITY

RESULTS FROM PISA 2000

OECD
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

FOREWORD

What effect do the policies and structure of education systems have on educational outcomes? Which school factors under the control of policy makers produce the best performance outcomes? These are questions that policy makers and those who run educational systems continually ask.

The OECD Programme for International Student Assessment (PISA) offers a unique opportunity to look at how the structure of schooling – including the grouping of students, segregation of schools, management and financing, school resources, and the instructional climate – influence the quality and equity of educational outcomes. Drawing on a rich body of educational research, this book analyses evidence from PISA 2000 in which school factors are associated with better quality and more equitable student performance.

The results show that the school students attend is strongly predictive of their performance. Furthermore, the socio-economic composition of schools explains far more of the differences in student performance between schools than do other school factors that are more easily amenable to policy makers, such as school resources and school policies. There is some evidence of an inequitable distribution of inputs – that schools with a more advantaged intake often have better educational resources. A positive school climate, in particular a strong disciplinary climate, is associated with better student performance and is a factor over which policy makers and schools have considerable control.

This report examines the performance of selective and comprehensive education systems. The mean student performance in selective education systems is on average lower than in comprehensive systems, although there is no evidence that comprehensive systems are more equitable in terms of the total variation in student performance. There is evidence that in many of the participating countries some degree of school autonomy has been realised in the domains of school policies, financial resources, and curriculum and instruction. However, personnel management lies beyond the responsibility of the majority of schools, although there is often more responsibility for this in private schools and having this responsibility is associated with better school performance.

PISA is a collaborative effort, bringing together scientific expertise from the participating countries, steered jointly by their governments on the basis of shared, policy-driven interests. Participating countries take responsibility for the project at the policy level through a Governing Board. Experts from these countries serve on working groups that are charged with linking the PISA policy objectives with the best available substantive and technical expertise in the field of international comparative assessment of educational outcomes. By taking part in these expert groups, countries ensure that the PISA assessment instruments are internationally valid and take into account the cultural and curricular contexts of OECD member countries, that they provide a realistic basis for measurement, and that they place an emphasis on authenticity and educational validity. The frameworks and assessment instruments for PISA 2000 are the product of a multi-year development process and were adopted by the OECD member countries in December 1999.

This report is the product of a concerted effort between the authors Hans Luyten, Jaap Scheerens, Adrie Visscher, Ralf Maslowski, Bob Witziers and Rien Steen at the University of Twente (Netherlands), the countries participating in PISA, the experts and institutions working within the framework of the PISA Consortium, and the OECD. The report was prepared by the OECD Secretariat, under the

direction of Claire Shewbridge and Andreas Schleicher. The development of the report was steered by the PISA Governing Board, chaired by Ryo Watanabe (Japan). Annex C of the report lists the members of the various PISA bodies, as well as the individual experts and consultants who have contributed to this report and to PISA in general.

The report is published on the responsibility of the Secretary-General of the OECD.

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QUALITY AND EQUITY IN EDUCATION

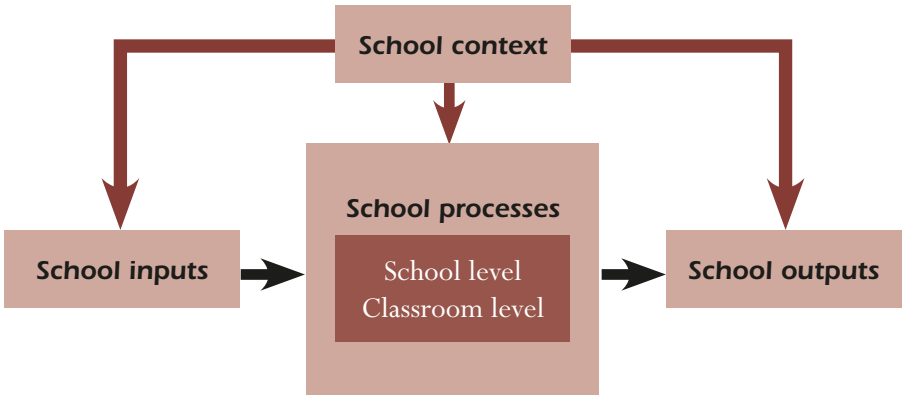
Introduction

Are there some school factors that are more closely associated with higher performance than others? What effect do the policies and structure of education systems have on educational outcomes? Among the school factors that are easily amenable to policy makers, such as management strategies, which seem to produce the best performance outcomes? There is a rich body of research in educational effectiveness that has highlighted factors at different levels of the education system that appear to be more closely associated with higher performance. To help build an evidence base, this report maps the data from PISA 2000 to those aspects of school context, school inputs and school processes that have received empirical support in different strands of educational effectiveness research.

Defining educational quality and equity within schools

Educational quality can be defined using a conceptual framework that depicts education within schools as a productive system in which school inputs are transferred into outcomes. Figure 1.1 presents a simple model of this framework.

Figure 1.1
Model of how schools function



School context should be considered as a source of both inputs and constraints. At the same time school context is essentially a generator of the desired school outputs, in the sense of the goals of schooling.

An example of a school output is the average achievement on a test in one or more basic subjects at a certain grade level. Another example, more an attainment than an achievement indicator, would be the proportion of students who obtained a diploma without any delay such as repeating a grade. However, school outputs are not limited to student achievement, but can also have a longer-term impact on society.

School processes are hierarchical (both by school and classroom levels) and sit within the national education structure. An example of a process variable at the school level is the degree of co-operation within the school, or the degree to which school leadership is instruction oriented (so-called "instructional leadership"). Examples of such variables from PISA 2000 include disciplinary climate and achievement press.[1] An example of a process variable at the classroom level is the amount of teaching time spent on a particular subject.

In some countries, the definition of the school in which students are taught is not straightforward because not all 15-year-olds are enrolled in the same type of school or at the same level of education. This report includes the grade level for each student in its analyses in order to at least partially control for this problem. PISA does not identify the classes students are in. This could be seen as a limitation with respect to studying teaching and classroom composition effects.

An examination of different aspects of this basic framework and their relationship to one another reveals several definitions of educational quality. Box 1.1 presents six different definitions of educational quality based on this framework. This report will use the instrumental effectiveness and equity definitions to analyse educational quality, because these quality aspects most prominently relate school factors with educational performance.

Analysis of quality within PISA 2000

The educational effectiveness approach analyses the impact or association of school factors that are most readily amenable to policy on educational performance levels after adjusting for previous student performance and other fixed background conditions of students. This value-added approach can be applied to an analysis of the PISA 2000 database. However, data on students' earlier performance are not available and therefore value-added analysis is not optimal. Educational performance is measured in terms of student scores on the reading, mathematical and scientific literacy scales. School factors are selected from information on the PISA 2000 school and student questionnaires. Adjustment for student background characteristics is based on the students' socio-economic status and immigration status, as reported by the students. Socio-economic background characteristics and policy-amenable school factors are likely to be correlated. Therefore, it is sometimes informative to analyse unadjusted, gross results in addition to adjusted, net results.

Analysis of equity within PISA 2000

This analysis will focus on equity in educational performance of students with different background characteristics. More specifically, students' socio-economic background and gender will be used as the main categories to analyse equity in educational performance. Equity also refers to the optimisation of policy-amenable school factors for specific sub-groups of students (*e.g.* students with high and low socio-economic backgrounds). Such a definition of equity also draws upon the instrumental effectiveness approach, and is generally described as differential effectiveness.

Which school factors are believed to be most important in educational effectiveness research?

There are three main strands of educational effectiveness research focusing on different school and classroom-level factors: economically-oriented studies of education production functions that look at resource input factors such as expenditure per student, teacher salaries and teacher qualifications; school effectiveness studies that examine organisational and managerial characteristics of schools; and studies on effective teaching and instruction that consider classroom management and teaching strategies (Scheerens, 2002).

Generally, research reviews indicate that factors that are closer to the students' actual learning process have the strongest impact. School factors have more impact than more distant factors, such as administrative characteristics of the education system at the national level (Wang *et al.,* 1993). Some research highlights the variables at the level of classroom teaching as having the strongest impact (Scheerens, 2003).

Box 1.1 Six different definitions of educational quality

The productivity view

The success of the education system depends on the attainment of the desired outputs and outcomes. Output, outcome and impact indicators are the predominant type or even the only type of quality indicators that need to be monitored. Examples of indicators include: 1) a satisfactory proportion of school-leavers who have attained a specified level of education (which may be formalised as a diploma); 2) acceptable employment levels for students, commensurate with the knowledge and skills they have acquired.

The instrumental effectiveness view

The success of the education system is contingent upon the instrumental potential of certain levels and forms of inputs and processes, *i.e.* their degree of association with performance. Context, input and process indicators within the education system are selected for their expected educational outcomes. In the hypothetical case where effectiveness or production functions would be completely specified in advance (in other words, with outcomes totally predicted), context, input and process indicators could replace outcome indicators. In actual practice, there is considerable uncertainty about outcomes and one should be extremely careful in treating input and process indicators as "proxy" outcome indicators. Clearly, the instrumental perspective offers more dynamic handles for policy. In contrast to the productivity perspective, it tries to shed light on conditions that influence performance and in doing so, discerns given constraints or antecedents, as well as factors that are more easily amenable to policy.

The adaptation perspective

The success of the education system relies on the critical analysis of educational goals. According to this view, conditions that allow for change in education would receive emphasis as means, while labour market outcomes or cultural capital could be considered as ends.

The equity perspective

The success of the education system depends upon an equal or fair distribution of inputs, processes and outcomes among participants in education with different characteristics.

The efficiency perspective

The success of the education system depends upon achieving the highest possible outcomes at the lowest possible cost. This perspective is an elaboration of the productivity and instrumental effectiveness views.

The disjointed view

The success of the education system is judged upon whether or not specified elements of the education system are performing in an acceptable way or at an acceptable level. This is an alternative view to all other views that consider the combination of or the relationship between the various elements in Figure 1.1. For example, indicators include: 1) acceptable levels of teacher training that meet the minimum requirements; 2) class sizes that are acceptable or manageable for teachers and students; 3) the acceptability of teaching strategies according to norms of good practice. The disjointed view is descriptively the simplest one, although in an evaluative sense it is perhaps the most arbitrary one.

Figure 1.2

School factors identified as important in educational effectiveness research

Education production functions	***Resource input variables:***
	Pupil-teacher ratio
	Teacher training
	Teacher experience
	Teachers' salaries
School effectiveness	***School organisational factors:***
	Productive climate culture
	Achievement pressure for basic subjects
	Educational leadership
	Monitoring/evaluation
	Co-operation/consensus
	Parental involvement
	Staff development
Effective teaching and instruction	High expectations
	Orderly climate
	Instructional conditions:
	Opportunity to learn
	Time on task/homework
	Monitoring at classroom level
	Aspects of structured teaching:
	- co-operative learning
	- feedback
	- reinforcement
	Differentiation/adaptive instruction

Source: Scheerens and Bosker, 1997.

Figure 1.2 presents an overview of main results from educational effectiveness research in Europe and the United States. All three main categories of school factors listed in the table (resource input variables, school organisational factors and instructional conditions) are relevant for the construction of indicators on policy-amenable school factors.

The initial results of PISA 2000 indicate the relevance of the structure of secondary education in each participating country (OECD, 2001). This factor appears to be particularly relevant for questions about equity and the selectivity of school systems. In addition, many system-level factors have been identified in educational research. The structure of the education system, educational standards and evaluation, school autonomy, broad support for education within a country and respect for the teaching profession have all been highlighted as factors that can improve educational performance. Box 1.2 shows results from three main sources.

Box 1.2 System-level factors

Schooling for Tomorrow: Learning to Bridge the Digital Divide (OECD, 2000) identified six scenarios for the future of schooling, categorised into three main strategies: extrapolating of the status quo, re-schooling and de-schooling scenarios. In the extrapolating of the status quo scenario schools still form part of a common bureaucratic school system and this is the most likely scenario. Factors that are of importance to the extrapolating of the status quo scenario are the categorical or integral structure of the education system; examination standards; discussion concerning more traditional direct instruction versus more open forms of teaching; accountability-related issues, such as parental involvement (choice of school) and the way schools' report performance. In the re-schooling scenario schools are described as focused learning organisations. Factors that are of importance to the re-schooling scenario are school autonomy; inclusive education; the innovative potential of schools; general educational standards; participative decision making at the school level; professional development; and schools' self-evaluation.

A research study commissioned by the German Ministry of Education asked six countries to identify which characteristics of their education system, at the national and school levels, contributed most to the differences in their PISA 2000 results (Doebert *et al.,* 2004). The results of this study draw attention to the importance of broad support for education within a country, esteem for teachers and the teaching profession, school autonomy, school networks, and various forms of educational monitoring and evaluation, including external school inspection.

Studies by Wößmann (2000) and Bishop (1997) based on the Third International Mathematics and Science Study (TIMSS) by the International Association for the Evaluation of Educational Achievement (IEA) provide evidence of the positive impact of a certain pattern of functional decentralisation and the importance for systems to have examinations and achievement standards. The pattern of functional decentralisation that emerges from Wößmann's analyses of TIMSS consists of relatively strong centralisation in the curriculum and assessment domains and liberalisation of the process dimensions of schooling. These studies focus on system-level characteristics and highlight factors such as school autonomy and the existence of a formal examination at the end of secondary school.

How well are the school factors identified as important in educational effectiveness research covered in the PISA 2000 database?

There is a fair coverage of the school factors identified in educational effectiveness research in the PISA 2000 database. Information was collected from schools and/or students on material and physical resources, human resources, school curriculum, monitoring and evaluation practices, relevant aspects of school climate and relevant equity factors. Notable omissions, however, are opportunity to learn, educational leadership and certain aspects of school organisation. In addition, there is a fair amount of information regarding teaching factors – for example, engaged learning time – stimulating engagement and climate aspects. However, teachers were not questioned in PISA 2000, therefore the limited information that is available on teaching factors represents the views of school principals and the students themselves. Relatively complex aspects of school organisation and management and teaching conditions have, for the most part, been measured by one single PISA questionnaire item. This perhaps accounts for the fact that certain theoretically interesting and relevant variables – such as the application and use of student assessment at school, teaching time, and the professionalisation and training of teachers – did not survive the initial screening test of a significant

correlation with achievement in a certain number of countries. Annex A provides complete details of the variables used in this report, along with explanations of why certain variables were not used.

How well can PISA 2000 shed light on the effects of school factors?

The PISA 2000 study was primarily designed to present valid and representative data on student performance in reading literacy. In the design of the study this aim clearly prevailed over the aim of providing representative information on schools and over the aim of showing causal links between school factors and performance, otherwise the sample would have included more than the current 150 schools per country. The performance of students in PISA 2000 cannot be solely attributed to their schooling conditions at the time of assessment. PISA cannot identify definite causes and effects, but some associations may be interpreted as causes. Box 1.3 presents some questions that should be considered when trying to causally relate school factors to student performance.

Box 1.3 How confidently can we interpret causes and effects in PISA?

PISA is a cross-sectional study and therefore it is not possible to establish definite causes and effects. However, school factors can be broken down into variables and these can be measured against the outcome (student performance in reading literacy) to show the degree of their association. The following should be considered when interpreting assumed causes and effects:

a) **How much do the explanatory variables being measured vary across countries?** There may not be much variation between explanatory variables and therefore their comparative effect may be suppressed. This might be the case for the variable educational resources, as there is a relatively homogeneous provision of educational resources in schools in the OECD countries, which diminishes the likelihood of finding clear effects.

b) **How much is the explanatory variable linked to other background variables?** It is hard to distinguish the singular effect of the explanatory variable from background variables. In fact, the explanatory variable is likely to be correlated with background variables and to have joint effects on the outcome variables that may be difficult, if not impossible, to disentangle.

c) **How stable are the explanatory variables over time?** The explanatory variables are measured at the same point in time as the effect variables. Therefore such variables can only be explanatory if they have a certain degree of stability over time. That is, the conditions observed at the time of the assessment are more or less the same as they were at a previous point in time, leaving sufficient time for the variables in question to take effect.

d) **Are the explanatory variables just the effect of another variable?** The explanatory ordering of variables may not always be clear, as certain educational actions might be the effect rather than the cause of specific performance levels. For example, the variable high expectations of student achievement might be seen as a favourable and stimulating climate factor, but could also reflect the appropriate assessment of a student's ability by a teacher.

Given the fact that PISA is a cross-sectional survey study it is clear that any attempt to causally attribute differences in performance to school factors should be made with much caution. Clearly, it is preferable to speak of influences rather than causes of educational success. Nevertheless if meaningful (*i.e.* statistically significant) associations are found between school factors and performance as measured in the PISA study,

some causal interpretations can be made. The appropriateness of interpreting associations as causes depends on the degree to which the following three conditions are met:

- A strong theoretical basis for the expected associations;
- The degree to which spurious relationships can be ruled out, by controlling for a third variable that could be the sole basis for the two variables of interest being associated; and
- The stability of the causal variables over time.

A strong theoretical basis for the expected associations

The PISA 2000 data on school factors offer a fair representation of the variables that have received support in empirical educational effectiveness research. Results of empirical studies in various strands of effectiveness research claim to shed light on what works in education. This increases the plausibility of any effects found in the selected PISA school factors.

The ruling out of spurious correlations

PISA has shown that student background has a strong impact on student performance. Therefore, this study controls for the socio-economic status of individual students and of all students within the school on average. However, there is no way to control for the impact of incoming student achievement. Socio-economic status is rather used as a proxy for this as other studies have shown that socio-economic status and achievement are correlated. Therefore, when interpreting the effect of socio-economic status one must consider that this also includes differences in the level of incoming student achievement.

The robustness of the causal variables

The school factors covered in PISA range from historically grounded structural characteristics of school systems to teaching behaviours that fluctuate and may directly interact with student performance. A tentative ranking from the most robust factors to the least robust factors would be:

- Structural characteristics of school systems (*e.g.* degree of selectivity)
- Socio-economic status of students
- Socio-economic composition of schools
- School resources
- School/teaching processes
- School climate/learning environment

Although PISA lends itself more to an analysis of the productivity view on educational quality (focus on outcomes) it would be wrong to conclude that an analysis of the effectiveness perspective on educational quality would not be possible. Given the strong body of educational effectiveness research, the fair coverage of school factors in PISA and the possibility to control for student and school socio-economic background it is possible to try to attribute outcome differences to variation in policy-amenable school factors. PISA also allows a cross-validation of the results of the impact of school factors and student background

characteristics across the three achievement domains, as well as an examination of the robustness of input-output and process-output relationships across countries.

The extensive set of variables that define student background characteristics provides a good basis to address issues of equity, inequity and selectivity in education. The analysis is enhanced even more when results are interpreted in the light of the structural characteristics of education systems (*e.g.* comprehensive versus selective education systems).

How this study can inform policy makers

If the school factor variables collected within PISA 2000 are instrumental to educational achievement then analysis of these variables can identify some powerful levers for policy makers. Depending on the degree of centralisation or decentralisation within the education system, the findings of PISA 2000 discussed in this report can help inform decision makers at various levels of education systems. Such findings are more relevant to school personnel as the degree of autonomy of the school increases. At the same time, the findings are relevant at higher administrative levels or to the support structure of education. Identifying what works at the school level can provide valuable information on potential levers for educational reform, such as initial teacher training, training programmes for school managers, in-service teacher training, student enrolment policies, accountability or even policies to restructure the entire school system.

This report aims to shed light on essential issues in educational policy, such as:

- The role schools play in quality and equity of student performance;
- The relative impact of school climate, school policies and school resources on student performance;
- The degree to which school systems seem to foster selectivity in education; and
- The impact of decentralisation and public versus private schooling.

The overall structure of the report

Chapter 2 presents results concerning the extent to which the schools that students attend make a difference in their performance. Chapter 3 focuses on the relative impact of three groups or policy-amenable school factors: school climate, school policies and school resources. Chapter 4 moves beyond the school level and clarifies the relationship between the structure of education systems (*e.g.* more comprehensive versus more selective systems) and educational quality and equity. Chapter 5 addresses decentralisation (school autonomy) and privatisation, first by presenting the degree of decentralisation in various areas of educational decision making, then by analysing the characteristics of private and public schools and investigating the relationships between decentralisation and private/public schooling on the one hand and school performance on the other. Finally, Chapter 6 presents the main findings of this study and their implications for policy makers.

Notes

1. Annex A provides a full list and definition of PISA 2000 variables and indices used in this report.

READERS' GUIDE

Data underlying the figures

The data referred to in Chapters 2 to 6 of this report are presented in Annex B. Three symbols are used to denote missing data:

a The category does not apply in the country concerned. Data are therefore missing.

c There are too few observations to provide reliable estimates. However, these statistics were included in the calculation of cross-country averages.

m Data are not available. Unless otherwise noted, these data were collected but subsequently removed from the publication for technical or other reasons at the request of the country concerned.

Calculation of international averages

The *OECD average* is the mean of the data values for all OECD countries for which data are available or can be estimated. The OECD average can be used to see how a country compares on a given indicator with a typical OECD country. The OECD average does not take into account the absolute size of the student population in each country, *i.e.* each country contributes equally to the average.

Readers should, therefore, keep in mind that the term OECD average refers to the OECD countries included in the respective comparisons.

The *average of countries participating in PISA* is the mean of the data values for all the countries including partner countries for which data are available or can be estimated. The average for countries participating in PISA can be used to see how a country compares on a given indicator with a typical country that participated in the PISA 2000 survey.

The Netherlands are excluded from the estimation of these averages because low response rates preclude reliable estimates of mean scores. In the case of other countries, data may not be available for specific indicators, or specific categories may not apply.

Reporting of student data

The report usually uses "15-year-olds" as shorthand for the PISA target population. In practice, this refers to students who were aged between 15 years and 3 (complete) months and 16 years and 2 (complete) months at the beginning of the assessment period and who were enrolled in an educational institution, regardless of the grade level or type of institution and of whether they are full-time or part-time students.

Reporting of school data

The principals of the schools in which students were assessed provided information on their schools' characteristics by completing a school questionnaire. Where responses from school principals are

presented in this publication, they are weighted so that they are proportionate to the number of 15-year-olds enrolled in the school.

Rounding of figures

Because of rounding, some figures in tables may not exactly add up to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

When standard errors in this publication have been rounded to one or two decimal places and the value 0.0 or 0.00 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05 or 0.005 respectively.

Abbreviations used in this report

The following abbreviation is used in this report:

S.E. Standard error

Further documentation

For further information on the PISA assessment instruments and the methods used in PISA, see *Knowledge and Skills for Life: First Results from PISA 2000* (OECD, 2001), the *PISA 2000 Technical Report* (OECD, 2002) and the PISA Web site (*www.pisa.oecd.org*).

Chapter

2

HOW MUCH DO SCHOOLS CONTRIBUTE TO QUALITY AND EQUITY IN STUDENT PERFORMANCE?

An overview of quality and equity and the role of schools

Each student performs differently in any given assessment. Performance differences can be explained by aptitude and student background, but also by the culture of the school the students attend. The studies that gave rise to educational effectiveness research surprised educators because of the low between-school variance that they found (Jencks *et al.*, 1972, Coleman *et al.*, 1966). Coleman found a 10 to 20 per cent difference in school performance depending on the ethnic background of the students studied. In addition, a large proportion of this variation was due to differences in the socio-economic status of the school population. School effectiveness and educational productivity researchers stress that schools do make a difference, although they have provided estimates of performance differences among schools that are not much higher than Coleman's 10 per cent.[1]

PISA 2000 assessed 15-year-olds in three different educational domains: reading, mathematics and science. This chapter first presents the variation in student performance in reading literacy as a measure of overall performance equity, then compares the role schools play in overall student performance differences across the different countries that participated in PISA 2000. Finally, the relative impact of schools on quality and equity in educational outcomes is assessed within each country.

Overall performance equity in PISA 2000 – how much does student performance vary in each country?

Figure 2.1 shows an overview of total between-student variation in reading literacy performance. The length of the bars is proportionate to the OECD average between-student variation (set at 100). Therefore a bar that is over 100 per cent indicates that the total between-student variation in that country is higher than the OECD average between-student variation, and a bar that is under 100 per cent indicates that the total between-student variation in that country is lower than the OECD average between-student variation. The OECD average line is drawn at 100. The total between-student variation varies considerably across countries from less than 80 per cent of the OECD average between-student variation in Japan, Korea, Mexico and Spain and in the partner countries Hong Kong-China, Indonesia and Thailand to 120 per cent and above in Belgium, Germany and New Zealand and in the partner countries Argentina and Israel.

Equity in school performance in PISA 2000 – does this vary across countries?

Given a more or less homogeneous set of educational provisions across countries, the largest part of the variation in educational performance would depend on the students' aptitude and background. However, how much does students' performance also depend on the particular school they go to? The bars displayed in Figure 2.1 have two distinct parts: one shows the between-school variance, while a second shows the within-school variance. The between-school variance indicates how much variation lies among schools. The larger the between-school variance, the more schools contribute to overall performance differences within each country. Three groups of countries are presented in Figure 2.1.

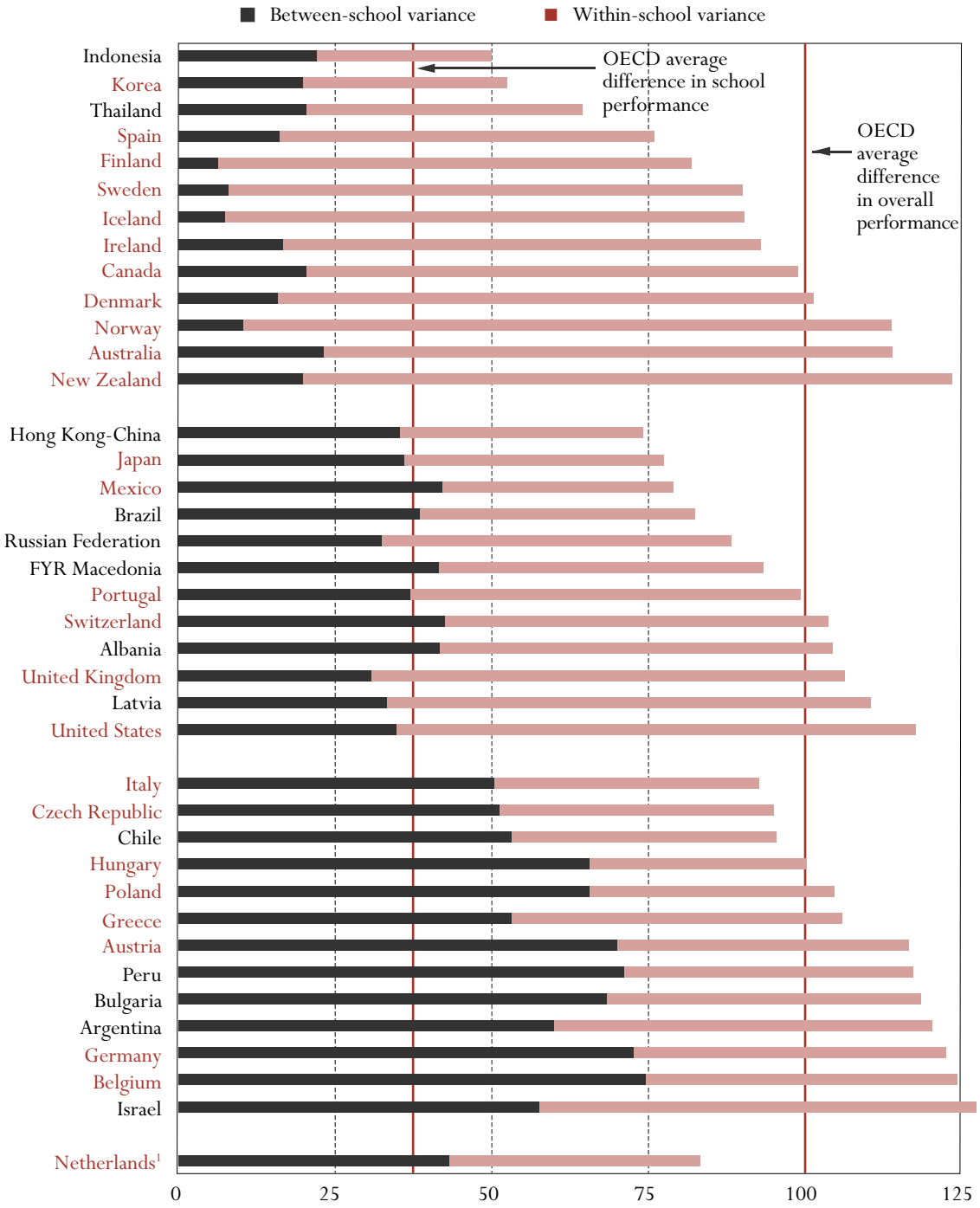
Countries with comparatively high equity among schools in PISA

The first group includes all countries with a between-school variance under 25 per cent of the OECD average between-student variation, *i.e.* countries for which a comparatively small amount of variation in student performance lies among schools. This group comprises the Nordic countries, Spain, three Asian countries (Indonesia, Korea and Thailand), plus four predominantly English-speaking countries (Australia, Canada, Ireland and New Zealand). Nine of the 13 countries in this group have below-average total variation. Between-school variance as a percentage of OECD average between-student variation is particularly low

Figure 2.1

Overall differences in student performance in reading literacy in PISA 2000 and the difference that schools make

Total variation in student performance in reading literacy proportionate to the OECD average total variation in student performance in reading literacy (100), showing between-school and within-school variance



1. Response rate too low to ensure comparability.

Note: Countries are grouped in three groups: countries with high equity among schools, countries with average equity among schools, and countries with low equity among schools.

Source: OECD PISA database. Table 2.2.

in Finland, Iceland, Norway and Sweden (10 per cent or under), and although in Denmark this is slightly higher (16 per cent) it is still comparatively low. However, comparatively low between-school variance does not necessarily mean a lower-than-average total variation in student performance: in Australia, Denmark, New Zealand and Norway, the total variation is above the OECD average. Comparatively high total variation can be seen in Australia and Norway (114 per cent) and New Zealand (124 per cent).

Countries with average equity among schools in PISA

A second group of countries includes all countries with a between-school variance ranging from 30 per cent to 42 per cent of the OECD average between-student variation. On average, 36 per cent of variation lies among schools in the OECD countries. This group comprises four Western European countries, two Asian countries, four Eastern European countries, two Latin American countries and the United States. Again, significant differences can be observed within the group. Seven of the 12 countries have lower than average total variation. In Japan, Mexico and the partner countries Brazil, Hong Kong-China and the Russian Federation, the total variation is less than 90 per cent of the OECD average between-student variation.[2] Conversely, the remaining five countries in this group have higher-than-average total variation, ranging from 103 per cent to 110 per cent of the OECD average between-student variation in Switzerland and the United Kingdom as well as in the partner countries Albania and Latvia, and to 118 per cent in the United States.

Countries with comparatively low equity among schools in PISA

A third group of countries includes all countries with a between-school variance ranging from 50 per cent to 75 per cent of the OECD average between-student variation, *i.e.* countries for which a comparatively large amount of variation in student performance lies across schools. In general, the total variation for the countries in this group is above the OECD average between-student variation. However, in the Czech Republic, Italy, and the partner country Chile, the total variation is between 92 per cent and 95 per cent of the OECD average of between-student variation and in Hungary this is average (100 per cent). The remaining nine countries have higher-than-average total variation. In Austria, Belgium, Germany, Hungary, and Poland, as well as in the partner countries Bulgaria and Peru, between-school variance is 66 per cent or more of the OECD average between-student variation. With the exception of Hungary, all of these countries have higher-than-average total variation (above 116 per cent in Austria, Belgium and Germany and the partner countries Bulgaria and Peru).

In the third group of countries it is clear that the school that students attend makes a significant difference to their performance in reading literacy. However, this is certainly also the case in some countries in the first and second groups. For example, in the second group six countries have between-school variance that is above the OECD average of 36 per cent, from 37 per cent of the OECD average between-student variation in Portugal to 42 per cent in Mexico, Switzerland and in the partner countries Albania and FYR Macedonia. In the first group, between-school variance for Korea and the partner country Indonesia[3] is only around 20 per cent of the OECD average between-student variation, but overall variation for these countries is low.

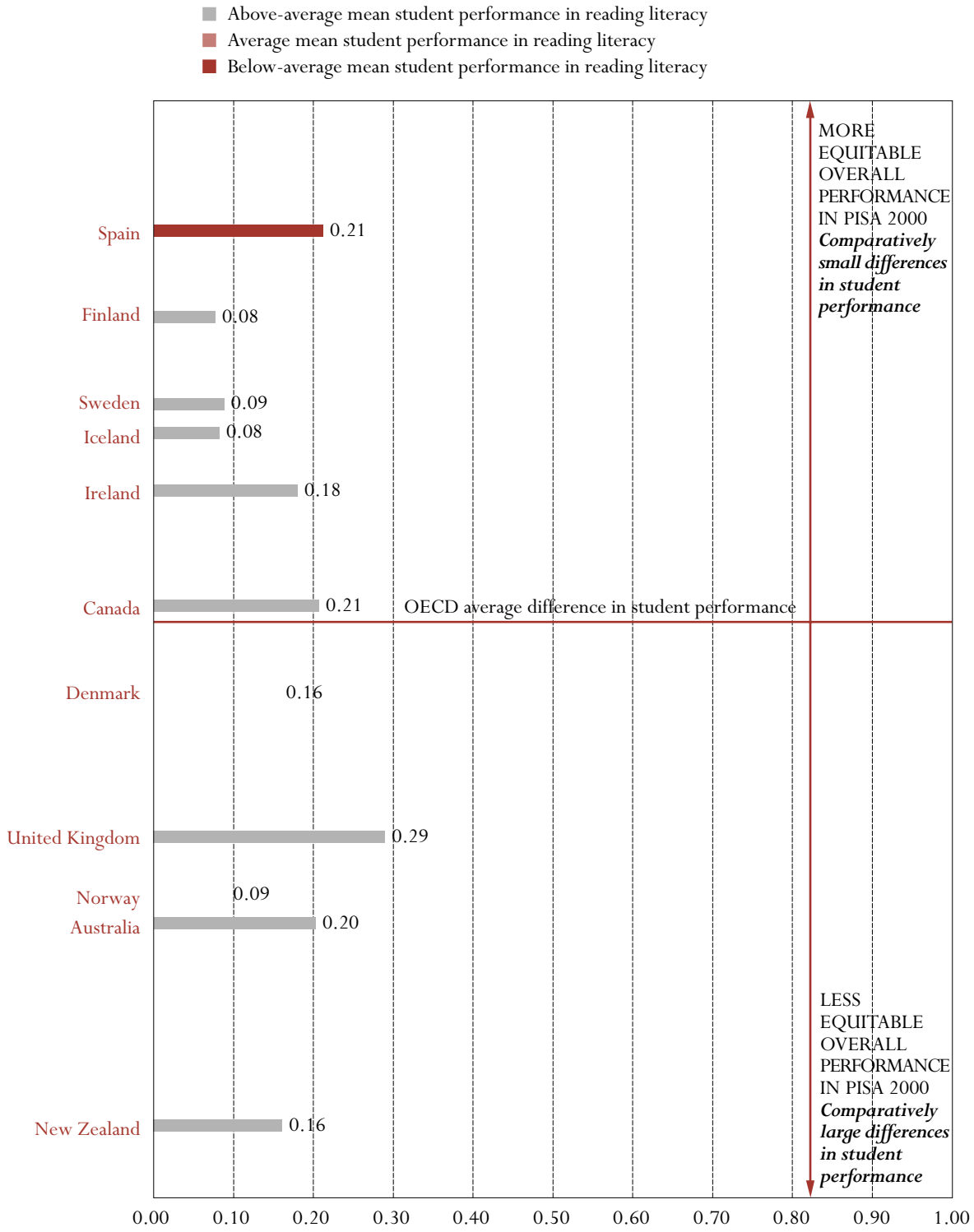
Equity of school performance within countries – what difference do schools make to student performance in each country?

One way to analyse the role of schools within each country is to simply look at the proportion of variance that can be attributed to schools. Mathematically this indicator is called the intra-class correlation and calculates between-school variance as a proportion of total between-student variation in each country. Countries that enjoy highest equity among schools are shown in Figure 2.2. This group of countries comprises the

Figure 2.2

Countries with the least performance differences between schools and the quality of performance in PISA 2000

Between-school variance in student performance in reading literacy is less than 30 per cent of the total variation in student performance in reading literacy[1]

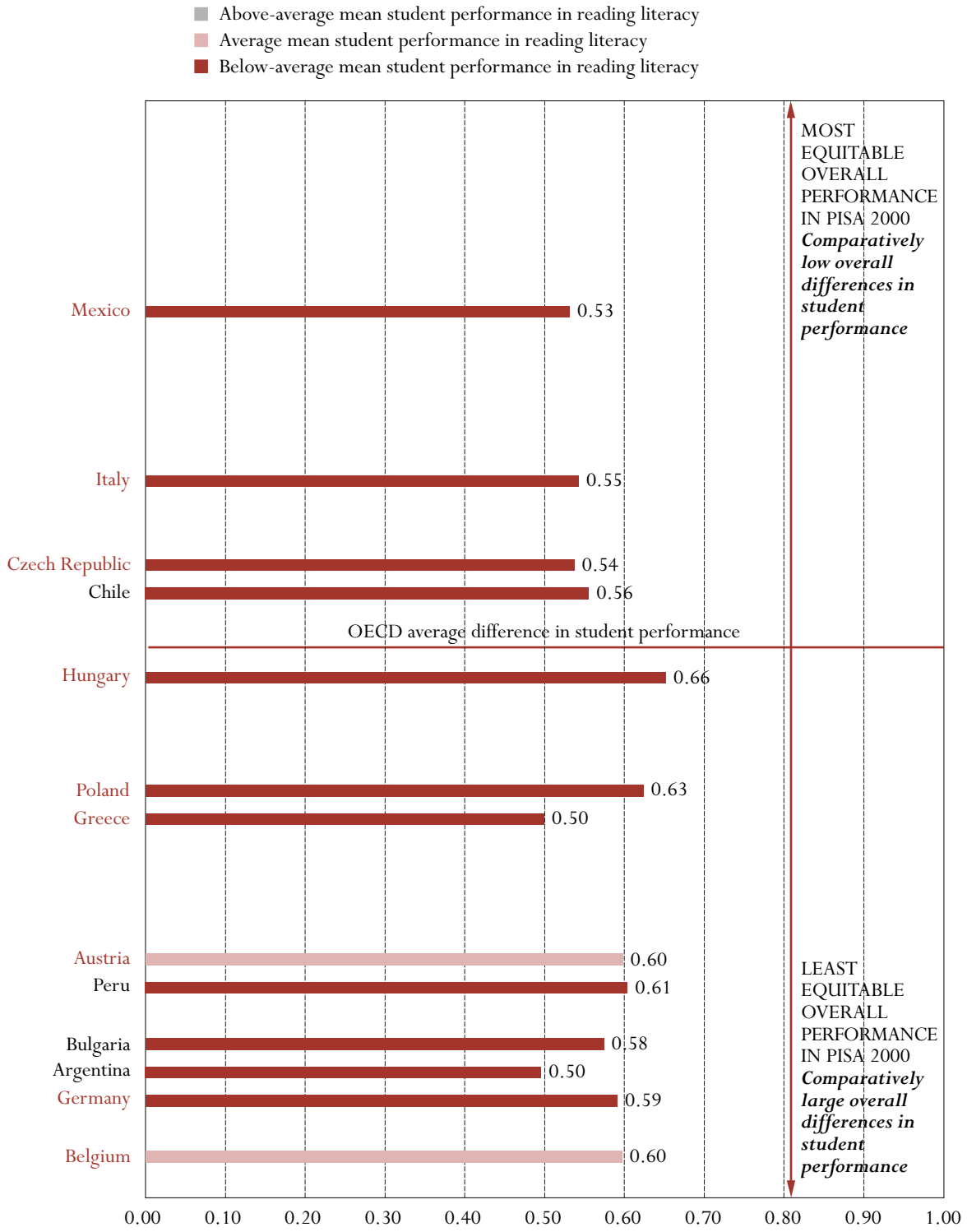


Note: Countries are ranked in ascending order of total variation in student performance in reading literacy.
1. This index is often referred to as the intra-class correlation (rho).
Source: OECD PISA database. Table 2.2.

Figure 2.3

Countries with the most performance differences between schools and quality of performance in PISA 2000

Between-school variance in student performance in reading literacy is 50 per cent or more of the total variation in student performance in reading literacy[1]



Note: Countries are ranked in ascending order of total variation in student performance in reading literacy.
1. This index is often referred to as the intra-class correlation (rho).
Source: OECD PISA database. Table 2.2.

Nordic countries, a number of predominantly English-speaking countries (Australia, Canada, Ireland and New Zealand) and Spain. The proportion of between-school variance ranges from 8 per cent in Finland and Iceland to 21 per cent in Canada and Spain. Countries are ranked in ascending order of their overall between-student variation, so that countries towards the top of the figure have comparatively low total between-student variation, *i.e.* high overall equity, and those towards the bottom have comparatively high total between-student variation, *i.e.* low overall equity. Although Australia, Norway and New Zealand have among the lowest proportion of variation among schools, their overall variation in student performance is high. Conversely, high equity among schools goes hand in hand with high overall equity in student performance in Finland, Iceland, Spain and Sweden.

Similarly Figure 2.3 shows the countries with the least equity among schools. Between-school variance as a proportion of each country's total variation in student performance ranges from 50 per cent in Greece and the partner country Argentina to 60 per cent or more in Austria, Belgium, Hungary, Poland and the partner country Peru. In terms of overall equity in student performance, the majority of countries in Figure 2.3 are in the bottom half of the figure and therefore have higher-than-average total between-student variation. Exceptions are Italy and Mexico (where overall variation in student performance is lower than the OECD average) and the Czech Republic, Hungary and the partner country Chile (where this is around the OECD average).

How does school equity within countries relate to quality?

Figure 2.2 also shows student performance in reading literacy as a simple measure of quality. Each country is shaded according to whether its mean performance in reading literacy is statistically significantly above the OECD average, not statistically significantly different from the OECD average, or statistically significantly below the OECD average. Mean performance that is statistically significantly above the OECD average is taken to represent high quality. Eight of the 11 countries with highest equity among schools, also have high quality in terms or their students' performance in reading literacy. Reading performance in Denmark and Norway is not statistically different from the OECD average, and only in Spain is the mean performance statistically lower than the OECD average.

In 11 of the 13 countries with low equity among schools (Figure 2.3) student mean performance in reading literacy is statistically significantly below the OECD average. This group shows a clear pattern that less equity among schools means lower overall quality. Two strong exceptions to this pattern are Austria and Belgium. Both countries have among the highest total between-student variation in PISA countries, yet have above average student performance in reading literacy.[4]

Conclusions

PISA shows that the school that students attend makes a difference to their performance in reading literacy. On average in the OECD countries, this explains 36 per cent of the differences in student performance in reading literacy. The role schools play varies significantly across countries, however. In Finland, Iceland, Norway and Sweden schools account for 10 per cent or less of the differences in student performance, but in Austria, Belgium, Germany and the partner country Peru schools account for about 60 per cent of the differences in student performance. Overall performance inequity is not necessarily linked to comparatively high differences in school performance. Australia, Denmark, Norway and New Zealand have comparatively the lowest differences in school performance, but comparatively high differences in student performance. In general, countries with lower differences in school performance have higher mean student performance in reading literacy.

Notes

1. Bloom (1971) estimated 25%, Rutter *et al.* (1979) 10%, and Walberg (1981) 15%; Witziers and Bosker (in Scheerens and Bosker, 1997) estimated gross between-school variance at 9%, and at 4% after adjustment for student background, on the basis of a meta-analysis of school effectiveness studies.
2. This measure of equity only refers to results in PISA and not to the education system as a whole. For example, in Brazil and Mexico slightly less than half of all 15-year-olds are not enrolled in education.
3. This measure of equity only refers to results in PISA and not to the education system as a whole. In Indonesia almost 30 per cent of all 15-year-olds are not enrolled in education.
4. The high between-student variation in Belgium may be due to relatively strong performance differences between the Flemish and the Walloon communities.

Chapter

3

THE RELATIVE IMPACT OF SCHOOL CLIMATE, SCHOOL POLICIES AND SCHOOL RESOURCES ON QUALITY AND EQUITY

Introduction

Policy-amenable school characteristics are those school factors under the control of national educational policy or school management, and refer to substantive educational policy measures in areas such as curriculum, governance, accountability, professional teacher development and other school-level characteristics that are believed to improve teaching. This chapter analyses three main groups of policy-amenable school characteristics: school climate, school policies and school resources. It also looks at school context as measured by the mean socio-economic background of students within the school, whether the school is public or private and where the school is located. These are considered to be relatively fixed characteristics of the school. However, the extent to which the school context is fixed is debatable, because schools, for example, could exercise admission and selection policies.

Determining the relative impact of both policy-amenable school characteristics and the school context on educational quality and equity sheds light on the margin of control policy makers hold. Policy-amenable school characteristics can be used to enhance productivity and contextual school factors related to admission and selectivity issues can be used to promote equitable outcomes. Quality is measured by high performance levels and equity by an equal distribution of quality among groups of students with different backgrounds. In this sense the most desirable measures of quality and equity would be the highest average performance levels, and the smallest variation in student performance.

This analysis of the PISA 2000 data to assess the relative impact of both types of characteristics has some limitations. PISA data are cross-sectional and not longitudinal, so it is impossible to determine precisely how much of the performance differences among schools is explained by policy-amenable school characteristics and how much by the contextual characteristics. What can be done, however, is to determine how much of the differences these two categories of variables explain jointly and uniquely. The degree of overlap of the two categories of variables in their association with performance will be discussed and related to the question of how equitably school assets are distributed among schools.

What is behind the differences in school performance?

Why do some schools perform better than others? If policy makers can identify the factors that contribute to differences in school performance, this can inform decisions about how to change school performance. For example, identifying the common features of higher performing schools may help with an aim of increasing the performance in particular schools. This may or may not form part of a wider policy to increase performance levels in all schools and decrease the performance differences among schools.

Policy-amenable school characteristics

Some factors are more readily controlled by policy makers, school managers and teachers. What impact do school characteristics that are more easily amenable to policy have on student performance? PISA allows a classification of policy-amenable school characteristics into three main categories:

- **School resources.** This includes material and physical resources such as the quality of a school's physical infrastructure and school size, as well as human resources such as the proportion of teaching staff with a tertiary qualification and the number of teachers within the school compared to the number of students.

- **School climate.** This covers different aspects of a school's culture, including the disciplinary climate, how well students and teachers get along, how strongly students identify with their school and how motivated and committed the school's teachers are.

- **School policies.** This includes the level of autonomy a school enjoys in decision making, and various accountability issues such as whether or not the school conducts self-evaluations and monitors student progress and whether or not the school communicates student performance information to parents or the local authorities. Finally, school policies identify the degree of selectivity within the school with regards to admission policies and the transfer of low achievers to different schools.

By controlling for student characteristics and school context it is possible to shed light on the relative impact of policy-amenable school characteristics that include school resources, school climate and school policies. A complete list of the variables used in the analysis is found in Box 3.1.

Box 3.1 PISA variables used in the analysis of the relative impact of policy-amenable school characteristics

1. Student characteristics (6)

Socio-economic status; gender; age; immigration status; grade level; type of study programme

2. School context (3)

School type; school location; school average socio-economic status

3. Policy-amenable school characteristics

School resources (8)

School size; index of the quality of a school's physical infrastructure; index of the quality of a school's educational resources; proportion of computers available to 15-year-olds; proportion of teachers with an ISCED 5A qualification in the language of assessment; index of teacher shortage; student-teaching staff ratio; professional development

School climate (8)

Index of disciplinary climate; index of teacher support; index of achievement press; index of teacher-student relations; index of students' sense of belonging in school; index of principals' perceptions of teacher-related factors affecting the school climate; index of principals' perceptions of student-related factors affecting the school climate; index of principals' perceptions of teachers' morale and commitment

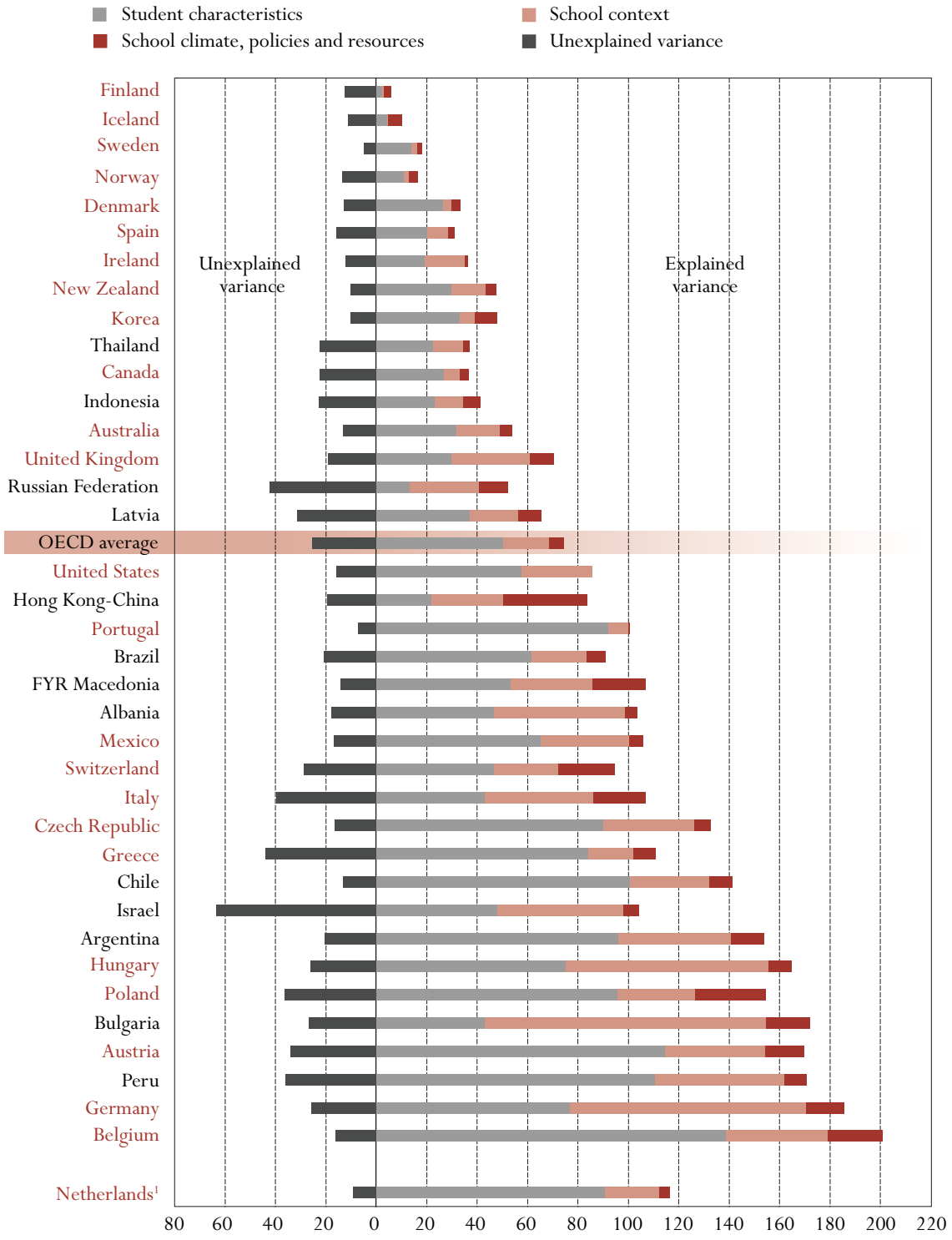
School policies (13)

Instructional time; index of monitoring of student progress; index of school self-evaluation; student's performance is considered for school admission; study programme for 15-year-olds is based on students' academic record; study programme for 15-year-olds is based on students' placement exams; transfer of low achievers to another school is likely; transfer of low achievers to another school is very likely; performance information is communicated to parents; performance information is communicated to school principal; performance information is communicated to local education authority; index of school autonomy; index of teacher autonomy

Figure 3.1

Between-school variance in student performance in reading literacy explained by student characteristics, school context and school climate, policies and resources

Proportionate to the OECD average proportion of between-school variance in student performance in reading literacy (100)



1. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 2.2 and 3.2.

Student characteristics, school context and school climate, policies and resources explain "three quarters" of the differences in school performance

Figure 3.1 displays the between-school variance for each country in student performance in reading literacy, but proportionate to the OECD average between-school variance. The OECD average between-school variance is shown as a bar in the figure and is set at 100 per cent. Countries are ranked in ascending order of between-school variance. Countries towards the top of the figure have comparatively low between-school variance and therefore higher equity among schools, and countries towards the bottom have comparatively high between-school variance and lower equity among schools. Unexplained variance is displayed to the left of the y axis and explained variance to the right. On average in the OECD countries, 50 per cent of between-school variance is explained by student characteristics, 18 per cent by the school context and 6 per cent by school climate, policies and resources (25 per cent of between-school variance remains unexplained). For eleven countries, however, most between-school variance is explained by the school context and policy-amenable school characteristics. These countries are Germany, Hungary, Italy, Switzerland and the United Kingdom, as well as the partner countries Albania, Bulgaria, Hong Kong-China, Israel, FYR Macedonia and the Russian Federation. Also, in Finland and Iceland most explained between-school variance is due to school context and policy-amenable school characteristics, although over half of the between-school variance remains unexplained.

The importance of school composition

On average in the OECD countries eighteen per cent of the differences in school performance in reading literacy is explained by the school context. The school location and school type only have a statistically significant impact on student performance in reading literacy in a few countries (in New Zealand and the United States, and in Poland respectively). In contrast, the school average socio-economic status has a statistically significant impact on student performance in reading literacy in all but four countries (Denmark, Finland, Iceland and Korea).[1] Currently the importance of such compositional effects is receiving more recognition in empirical school effectiveness research (Opdenakker and Van Damme, 2001). Taking into consideration the even stronger impact of the individual student characteristics (50 per cent on average in the OECD countries) this finding further stresses the importance of the composition of the student population of the school. School composition by far outweighs the impact of the policy-amenable characteristics and together with individual student characteristics explains on average 69 per cent of school effects, as opposed to the 6 per cent explained by policy-amenable school characteristics.

Compositional effects can be interpreted substantively as peer effects (when the majority of students have favourable characteristics this benefits student performance, or vice versa) or as teacher effects (teachers teach better when school composition is favourable, and vice versa). Some caution in the interpretation of compositional effects is required, however, as these effects may be due to unreliability in the measurement of the individual student background variables and the omission of potentially relevant explanatory variables (Harker and Tymms, 2004). Figure 3.2 shows the compositional effects for all countries. The effect of school composition is particularly strong in Austria, the Czech Republic, Germany, Greece, Hungary, Poland, the United Kingdom and the United States, as well as in the partner countries Bulgaria and Israel, where an increase in school average socio-economic status by one unit would result in an increase of 28 to 42 score points on the PISA reading literacy scale.

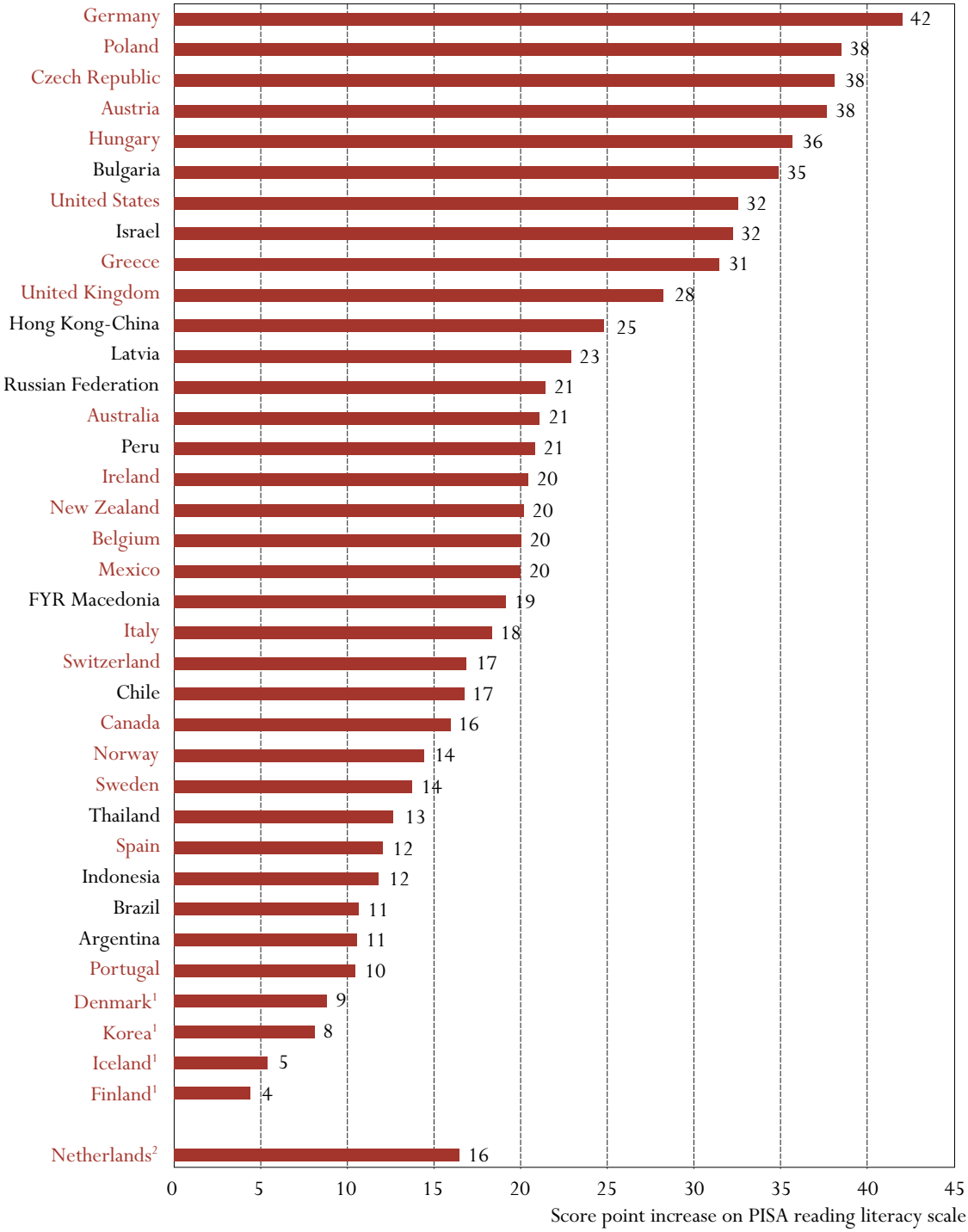
The impact of school climate, policies and resources

For several countries the policy-amenable school characteristics do have a significant impact, however. In Finland, Iceland, Korea and the partner country Hong Kong-China, policy-amenable school characteristics

Figure 3.2

The effect of school composition on student performance in reading literacy

The increase in score points with one unit change in school average socio-economic status on student performance in reading literacy



1. Effect is not statistically significant.
2. Response rate too low to ensure comparability.

Source: OECD PISA database. Table 3.8.

explain more between-school variance than school context does. In Belgium, Italy, Norway, Poland, Switzerland and the United Kingdom, as well as in the partner countries Indonesia, FYR Macedonia and the Russian Federation, 10 per cent or more of between-school variance is explained by policy-amenable school characteristics.

School climate has more impact than school resources or school policies

Among the policy-amenable school characteristics, school climate explains the most between-school variance in PISA. Figure 3.3 presents the proportion of between-school variance explained uniquely by the school climate (top grey section of each bar). For all but five countries a statistically significant amount of the differences between schools in student performance is explained by the school climate (8 per cent on average in the OECD). Over 15 per cent of differences between schools is explained by the school climate in Iceland, Norway and the partner country FYR Macedonia, and over 10 per cent in Italy, Korea, Poland and Switzerland, and the partner country Hong Kong-China. In 15 countries the school climate explains 5 per cent or less of the between-school variance. On average, school resources only explain 2 per cent of between-school variance, although this is 8 per cent in Belgium, and in the partner countries the Russian Federation and Hong Kong-China it is 6 per cent and 32 per cent, respectively. Similarly, on average across the OECD countries, only 2 per cent of between-school variance is explained by school policies, but this is 9 per cent in Switzerland and 8 per cent in the United Kingdom.

To what extent are school composition and school climate, policies and resources associated?

However, student characteristics and school context, climate, policies and resources are not entirely independent of each other. There is a certain amount of overlap in how much of the differences in school performance each set of characteristics explains. The amount of school differences jointly explained by school composition and policy-amenable school characteristics could indicate to what extent more advantaged students enjoy better schooling conditions. It could be argued either that students from more advantaged backgrounds (as measured by the socio-economic status of their parents) and/or their parents choose better schooling conditions or that students actively create better learning conditions as schools respond to their higher demands. Although the cross-sectional nature of the PISA study precludes distinguishing one interpretation from the other, it is important to note the existence of this overlap of influences on variation in student performance among schools.

Differences between schools jointly explained by school climate, student characteristics and school context

Figure 3.3 presents the proportion of between-school variance explained jointly by the school climate and student characteristics and the school context (light red section of each bar). The amount of differences between schools in student performance that is jointly explained by the school climate and student characteristics and the school context is 31 per cent on average in the OECD countries. About 50 per cent or more of differences between schools are jointly explained by the school climate and student characteristics and the school context in Belgium, the Czech Republic, Germany, Korea and Portugal, and the partner countries Argentina, Bulgaria, Chile and FYR Macedonia.

Differences between schools jointly explained by school policies, student characteristics and school context

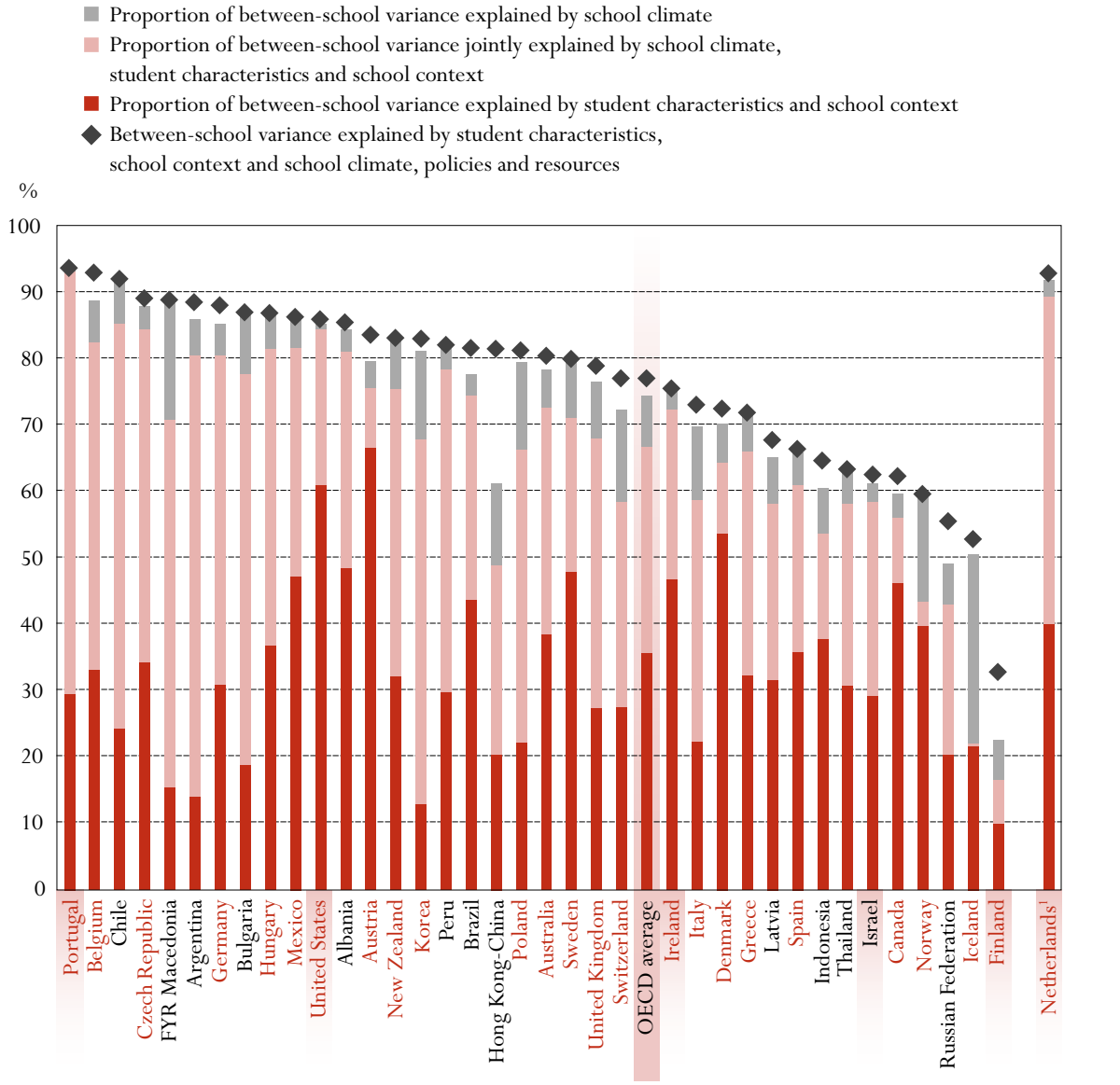
Similarly, Figure 3.4 presents the proportion of between-school variance explained jointly by school policies and student characteristics and the school context (light red section of each bar). The amount of differences between schools in student performance that is jointly explained by school policies and student characteristics and the school context is 17 per cent on average in the OECD countries. This is much less

than was found for school climate (31 per cent). However, school policies jointly explain over 30 per cent of the differences between schools in Austria, Germany, Hungary and Mexico, and over 40 per cent in the partner countries Argentina, Brazil, Bulgaria and Chile.

Figure 3.3

Differences between schools in student performance in reading literacy explained by school climate

Proportion of between-school variance in student performance in reading literacy explained uniquely by school climate, jointly by school climate, student characteristics and school context and uniquely by student characteristics and school context

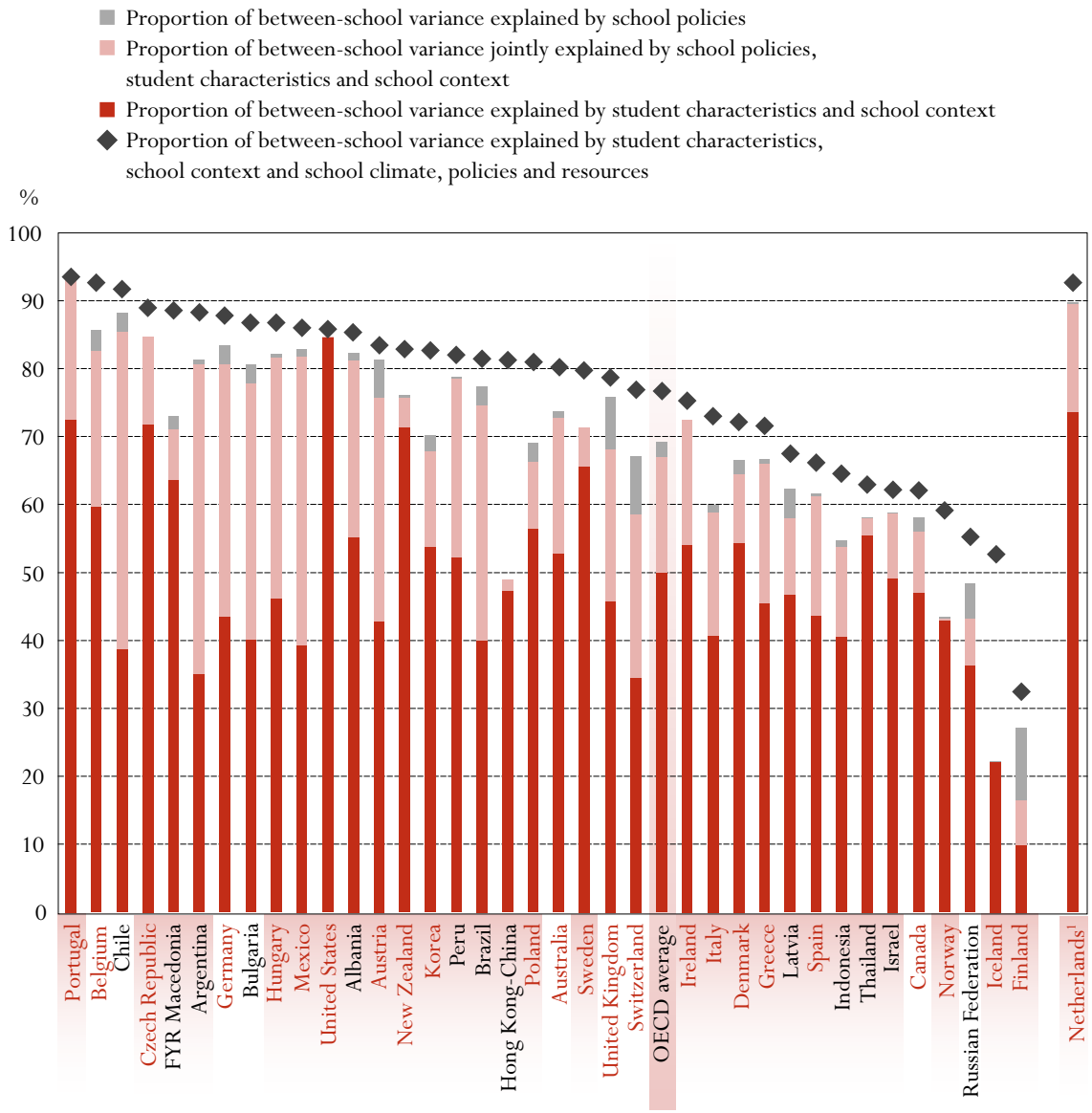


Note: Countries are ranked in descending order of proportion of between-school variance explained by student characteristics, school context and school climate, policies and resources. Results for countries shaded are not statistically significant.
1. Response rate too low to ensure comparability.
Source: OECD PISA database. Table 3.3.

Figure 3.4

Differences between schools in student performance in reading literacy explained by school policies

Proportion of between-school variance in student performance in reading literacy explained uniquely by school policies, jointly by school policies, student characteristics and school context and uniquely by student characteristics and school context



Note: Countries are ranked in descending order of proportion of between-school variance explained by student characteristics, school context and school climate, policies and resources. Results for countries shaded are not statistically significant.
1. Response rate too low to ensure comparability.
Source: OECD PISA database. Table 3.4.

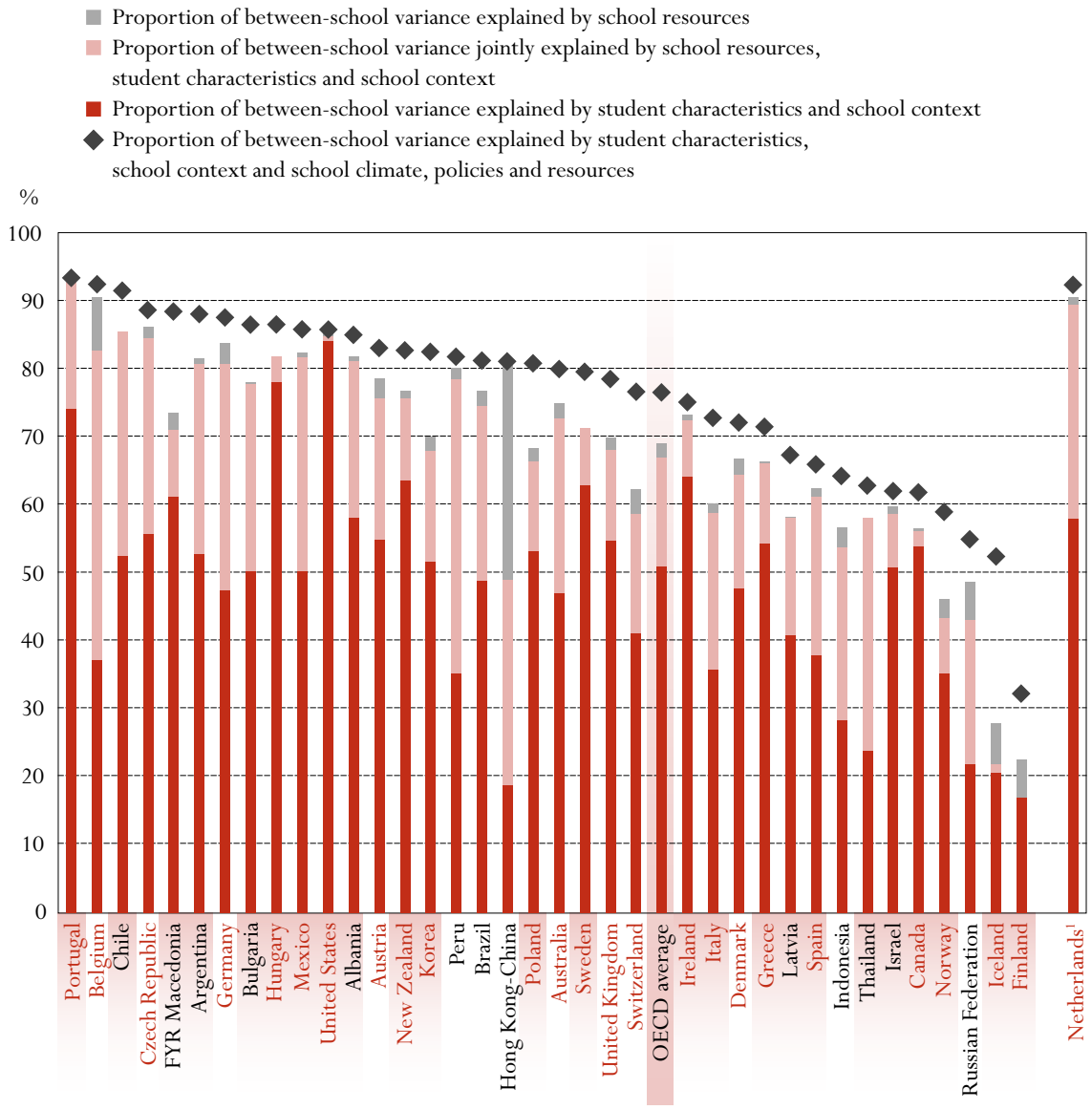
Differences between schools jointly explained by school resources, student characteristics and school context

Figure 3.5 shows a similar story for school resources. On average in the OECD countries, school resources, student characteristics and school context jointly explain 16 per cent of the differences between schools in student performance (light red section of each bar). However, school resources and student characteristics and school context jointly explain over 30 per cent of differences between schools in Germany, Mexico and the partner countries Chile, Hong Kong-China and Thailand, and over 40 per cent in Belgium and the partner country Peru.

Figure 3.5

Differences between schools in student performance in reading literacy explained by school resources

Proportion of between-school variance in student performance in reading literacy explained uniquely by school resources, jointly by school resources, student characteristics and school context and uniquely by student characteristics and school context



Note: Countries are ranked in descending order of proportion of between-school variance explained by student characteristics, school context and school climate, policies and resources. Results for countries shaded are not statistically significant.
1. Response rate too low to ensure comparability.
Source: OECD PISA database. Table 3.5.

Why is there such a strong association between the school climate and student characteristics and school context? It could be argued that school climate is more closely dependent on school composition and therefore relatively less easily controlled by the school than school policies and resources, or that students from an advantaged socio-economic background perhaps bring more disciplined habits and a more positive perception of school values to the school. In contrast, why should schools with comparatively more advantaged student populations (in terms of parents' occupational status) be better equipped or have

more qualified teachers than those attended by more disadvantaged populations? The degree to which school composition and either school resources or school policies jointly explain variance could therefore be interpreted as an indicator of the magnitude of the inequitable distribution of human and material resources in a country.

How do policy-amenable school characteristics influence student performance?

Given the often substantial overlap of influences of each group of policy-amenable school characteristics and of student characteristics and school context, how can the way each factor influences the outcome of student performance be analysed? Statistically speaking, the unique effects of each factor may understate its importance, but substantively unique effects give a fairer impression of the added value of schools' policies and practices (including the nature of teaching in schools). An adjustment for student characteristics and school context essentially allows a comparison of like with like. Similarly, the gross or unadjusted effects of each factor may overstate its importance, but give a more realistic image of the choices that would face parents when selecting schools. It can be also be argued that parents are interested in the summative effect of schooling, from whatever source that is relevant to influence performance (Willms and Raudenbush, 1989).

Assuming that background characteristics and school factors work in the same direction, the unadjusted effects could be expected to be larger and therefore reach statistical significance more often. Figure 3.6 shows statistically significant effects for adjusted and unadjusted analyses for the OECD countries on average and indeed this is the case. However, it is also possible that the effect of favourable teaching conditions is suppressed by less favourable student background characteristics. This result has sometimes been found in school effectiveness research studies (De Mayer and Rynemans, 2004), but does not come through in the results here.

School climate

School climate effects – unadjusted for student characteristics and school context

Figure 3.6 shows a series of regression coefficients that can be interpreted as the associated increase or decrease in score points in student performance in reading literacy for an increase of one unit of the listed index. For example, for every unit increase on the index of principals' perceptions of student-related factors affecting school climate, students score 21 points more – *i.e.* this has a positive impact on student performance. Without adjustment for student characteristics and school context all the school climate variables have a statistically significant impact on student performance in reading literacy. A unit increase in the index of principals' perception of student-related factors affecting the school climate (21 score points), the index of students' sense of belonging (17 score points), the index of disciplinary climate (13 score points) and the index of teachers' morale and commitment (5 score points) are all positively associated with performance. In contrast, the index of teacher support (-13 score points), the index of teacher-related factors affecting the school climate (-8 score points), the index of teacher-student relations (-4 score points) and the index of achievement press (-3 score points) are all negatively associated with student performance. This appears quite logical in the way that teachers would give more support to lower performing students and put more pressure on them to achieve. Furthermore, a positive school climate and a higher sense of belonging at school would foster better student performance.

Added value of school climate – adjusted for student characteristics and school context

However, how much do these reflect more advantaged student populations? The adjusted results show statistically significant associations for only five of the school climate variables. Of these, student-related factors affecting the school climate (10 score points), disciplinary climate (8 score points) and

Figure 3.6

The effect of school climate, school policies and school resources on student performance in reading literacy in OECD countries on average

Regression co-efficients for school climate, school policies and school resources variables both unadjusted and adjusted for student characteristics and school context

Source: OECD PISA database. Tables 3.6 and 3.7.

students' sense of belonging (5 score points) have a favourable impact on student performance over and above the school composition. Similarly, teacher support (-4 score points) and teacher-related factors affecting the school climate (-4 score points) still have a negative impact on student performance once the school composition has been accounted for. Although the OECD average of these aspects is statistically significant, this does not hold for all countries. Figure 3.7 shows the countries in which these aspects of school climate have a statistically significant impact on student performance in reading literacy. In addition, there are two aspects that do not have a statistically significant impact on the mean student performance in reading literacy in the OECD countries on average but that nevertheless do have an impact in some individual countries (on the index of achievement press and the index of teacher-student relations).

Figure 3.7

Countries in which aspects of school climate have a statistically significant impact on student performance in reading literacy once adjusted for student and school background

Aspect of school climate	Negative impact	Positive impact
Index of principals' perceptions of student-related factors affecting school climate		Austria, Belgium, Canada, Czech Republic, Italy, Korea, Poland, United Kingdom
Index of disciplinary climate		Australia, Canada, Czech Republic, Germany, Hungary, Italy, Korea, Mexico, Sweden, United Kingdom, United States
Index of students' sense of belonging at school		Greece, Hungary, Korea, Mexico, Poland, Portugal, Switzerland
Index of teacher support	Germany, Italy, Switzerland	Poland
Index of principals' perceptions of teacher-related factors affecting school climate	Austria, Canada, Switzerland	
Index of achievement press	Iceland, New Zealand	Greece, Korea
Index of teacher-student relations	Austria	Switzerland

School resources

School resources effects – unadjusted for student characteristics and school context

Five of the school resources variables have a statistically significant impact on student performance. School size (16 score points), proportion of teachers with a third level qualification in the language of assessment (15 score points), the index of the quality of the school's educational resources (7 score points) and the index of teacher shortage (7 score points) are all positively associated with student performance. The index of the quality of a school's physical infrastructure (-3 score points) has a statistically significant negative association with student performance.

Added value of school resources – adjusted for student characteristics and school context

The positive effects are significantly reduced once adjusted for student characteristics and school context: school size (from 16 to 4 score points), quality of school's educational resources (from 7 to 2 score points), proportion of language of assessment teachers with a third level qualification (from 15 to 5 score points), and the index of teacher shortage are no longer statistically significant. The negative effect of the index of the quality of schools' physical infrastructure reduces to -2 score points once an adjustment is made for individual student characteristics and school context. Figure 3.8 shows the countries in which these aspects of school resources have a statistically significant impact on student performance in reading literacy.

Figure 3.8

Countries in which aspects of school resources have a statistically significant impact on student performance in reading literacy once adjusted for student and school background

Aspect of school resources	Negative impact	Positive impact
Proportion of teachers with a third level qualification in language of assessment		Belgium, Germany, Switzerland, United Kingdom
School size		Austria
Index of the quality of schools' physical infrastructure	Czech Republic	

School policies

School policies effects – unadjusted for student characteristics and school context

Only four of the school policies variables have a statistically significant impact on student performance. These relate to selection and transfer policies and school autonomy. The transfer of low achievers to another school has a comparatively strong positive impact on student performance when very likely (43 score points) and likely (29 score points). The fact that student's performance is considered for school admission is positively associated with student performance (15 score points).

Added value of school policies – adjusted for student characteristics and school context

The impact of the transfer of low achievers to another school is still significant (14 score points when very likely and 7 score points when likely) when individual student characteristics and school context are adjusted for. The fact that student's performance is considered for school admission is positively associated with student performance even after adjustment for individual student characteristics and school context (4 score points). School autonomy has a small but statistically significant negative association with student performance once individual student characteristics and school context have been adjusted for (positive association of 3 score points without adjustment). Figure 3.9 shows the countries in which these aspects of school policies have a statistically significant impact on student performance in reading literacy.

Figure 3.9

Countries in which aspects of school policies have a statistically significant impact on student performance in reading literacy once adjusted for student and school background

Aspect of school policies	Negative impact	Positive impact
Transfer of low achievers to another school very likely		Switzerland
Transfer of low achievers to another school likely		Canada[2]
Student's performance is considered for school admission		Austria, Mexico, Portugal, United Kingdom
Index of school autonomy	United Kingdom	
Instructional time		Poland, United Kingdom
Index of monitoring of student progress		Austria
Performance information is communicated to school principal	Finland	
Study programme for 15-year-olds is based on students' academic record		Canada
Index of teacher autonomy		Canada

In addition, five aspects that do not have a statistically significant impact on mean student performance in reading literacy in the OECD countries on average do have an impact in some individual countries (instructional time, index of monitoring of student progress, communication of performance information to school principal, study programme of 15-year-olds is based on students' academic record and index of teacher autonomy).

Conclusions

School composition has by far the greatest impact on student performance in reading literacy. Schools may implement selection policies to actively control school composition. For example, there could be a set quota of number of students with a particular background. In addition, schools could exercise policies to match teachers and student groups within the school, as well as policies to influence the representation of teachers with specific characteristics in a school (a teacher compositional effect). It seems likely that a school's climate would depend on the collective personality characteristics of teachers so that one could speak of teacher compositional effects. Of course school composition in this report is only considered in terms of the school average socio-economic background. PISA cannot show to what extent the school composition is influenced by student abilities.

School climate, policies and resources together explain 6 per cent of the performance differences between schools, but this varies greatly across countries. Of the three, school climate has the greater impact. However, the lesser impact of school factors that are more easily amenable to policy does not make them any less important. On the contrary, the results indicate several potential policy levers to improve school performance: improved disciplinary climate and student-related factors affecting the school climate, and a strong sense of belonging at school. A sense of belonging has a relatively strong impact on the performance of students in education systems where they are selected for particular institutions or educational programmes. Some selection and admission policies also explain a relatively large part of the differences in school performance. Although the OECD countries are relatively homogenous in terms of their school resources, the proportion of qualified teachers, educational resources and school size do make a difference to school performance.

In many cases school climate is heavily influenced by the school composition. However, this is also sometimes the case for school resources and school policies. These are areas over which schools and educational systems have more control and efforts could be made to ensure a more equal distribution among schools. This could be seen as specifically relevant for schools with a comparatively disadvantaged student population.

Notes

1. As shown in *Knowledge and Skills for Life*: *First Results from PISA 2000* (OECD, 2001), the fact that for some of these countries average socio-economic status does have a statistically significant impact on student performance in reading may be due to the different definitions of socio-economic status in the two reports (ISEI vs. HISEI).
2. The effect of this variable is significant even though the frequencies for this variable are low in Canada (only 12% of schools reply that transfer is likely).

Chapter

4

THE STRUCTURE OF EDUCATION SYSTEMS AND QUALITY AND EQUITY IN STUDENT PERFORMANCE

Introduction

To what extent does the structure of an education system affect the quality and equity of educational outcomes? Quality, as defined according to the productivity/effectiveness view discussed in Chapter 1, relates primarily to the realised level of performance (mean student performance in reading literacy). Equity is measured by the variation in student performance in reading literacy, and by the correlation between students' socio-economic status and student performance in reading literacy. Chapter 2 shows evidence that quality and equity can be compatible goals. This chapter investigates whether data from PISA 2000 provides any evidence that particular structures of education systems promote higher levels of quality and/or equity.

The structure of education systems and educational differentiation

Education systems take many different structural forms. Broadly speaking, systems can be classified on a continuum running from systems with low degrees of educational differentiation to systems with high degrees of educational differentiation. Educational differentiation can take place at the system level, at the school level and at the class level. It is fairly easy to classify education systems with respect to the degree of educational differentiation at the system level, but educational differentiation becomes more covert at the school and class levels.

Educational differentiation at the system level

Grouping students into specific institutions or educational programmes

A number of countries have selective education systems that group secondary students into different institutions according to their level of performance. Students are selected to attend a particular type of institution, where they follow a particular type of educational programme with students of similar academic levels. The assumption is that an intellectually homogeneous student body fosters the development of talent and enhances efficient teaching, thus improving the quality of educational outcomes. However, there has been heavy criticism of this approach in educational debates and it has been argued that the selection and grouping of students into different institutions reinforces existing socio-economic disparities and thus increases inequity in educational outcomes (Creemers and Scheerens, 1988). Although there may also be some selective schools within comprehensive education systems, comprehensive schools generally do not select students for specific educational programmes, but rather on the basis of their academic record. In comprehensive schools, students still follow the same programmes as those offered in other schools, but study among a more academically homogenous group.

Age of selection within compulsory education years

Institutional differentiation occurs in every education system at a certain age. However, this varies greatly across countries and in some countries may not happen during the years of compulsory education. Countries such as Austria and Germany select students by level of performance directly after the completion of primary education, which may be as early as the age of ten. In contrast, countries such as Canada and New Zealand do not have formal selection within the education system before the end of upper secondary education (and therefore compulsory education), which may be up until the age of eighteen.

Educational differentiation at the school level

Differentiation by type of educational programme

Students often follow different types of educational programmes, the major distinction being between general and vocational programmes. Students may not necessarily have to attend a particular institution in

order to follow a vocational programme. Some institutions offer both vocational programmes and general programmes. This would result in limited variation among schools with regard to student performance. However, some institutions may specialise in a certain type of educational programme and therefore differentiation by type of programme would be expected to mirror institutional differentiation and higher variation among schools in student performance would be likely.

Internal differentiation

Comprehensive education systems do not select and group students into distinct institutions to follow specific educational programmes. Therefore, lower variation in student performance among schools would be expected. However, comprehensive schools may group students within the school into different streams or tracks according to their performance, thus producing high within-school variance. There is also often a considerable flexibility in the combination of subjects that students can study. In some comprehensive systems students can choose between a large number of available subjects up until the end of upper secondary education and may even sit examinations in each subject at a different level. Schools may also provide additional courses for both talented students and low achievers in order to meet the wide range of needs and abilities within their student group.

Socio-economic composition of the school

Even when all students follow the same programme, it is possible that the levels of performance or the socio-economic backgrounds of students differ considerably among schools. Differences in the socio-economic levels in the region or town in which the school is located may lead to substantial variation in student performance among schools.

Box 4.1 Aspects of educational differentiation that cannot be examined in PISA

Educational differentiation at the system level

One problem with regard to assessing quality and equity of education systems on the basis of the PISA 2000 database is that the PISA students are only a representative sample of 15-year-olds enrolled in education. In several countries, a significant proportion of the population of 15-year-olds is not enrolled in schools (*e.g.* in Mexico and the partner countries Albania, Brazil, Indonesia, FYR Macedonia, Peru and Thailand). The fact that there is far from universal enrolment at the age of 15 in these countries would imply a less equitable education system. The findings presented in this report for these countries only concern the proportion of the enrolled population and therefore interpretation of measures of quality and equity should be made with caution.

Educational differentiation at the class level

The variation between classes within schools is an important aspect of educational differentiation. However, the design of the PISA 2000 survey does not allow the analysis of such variance. There are several possible sources of variation between classes within schools. The more overt reasons include the fact that schools may offer different programmes, or that schools may track or stream students of different abilities into different classes within the same study programme. There are other more covert aggregation phenomena that are often due to the students' choice of optional courses or to various strategies employed by school staff, such as isolating all students with behavioural problems in a single class to prevent disruption in other classes. Also, parental choice may cause further variation: for example, parents may demand to enroll their children in specific classes.

Indicators of educational differentiation in PISA 2000

PISA allows the analysis of a number of forms of educational differentiation. Two main categories of differentiation are distinguished: institutional differentiation and realised differentiation. This chapter uses two structural measures (age of selection and the number of educational programmes available to 15-year-olds) to indicate the degree of institutional differentiation in each education system. Analysis of PISA data can show whether institutional differentiation is related to other forms of educational differentiation and if so, how much this impacts on quality and equity in education systems. Four indicators of realised educational differentiation within the PISA assessment are analysed:

- Proportion of between-school variance in student performance in reading literacy
- Proportion of between-school variance in average school socio-economic status
- Percentage of students in general programmes
- Amount of variation in grade levels

Table 4.1 presents an overview of country results on the six measures of educational differentiation.

Indicators of institutional differentiation in PISA 2000

The number of programmes into which students are grouped and the first formal age of selection are two key indicators of the degree of institutional differentiation or, conversely, integration in an education system. Information on both these measures was collected from PISA National Project Managers.

If students are selected, then there must be at least two distinct educational programmes available within the education system. There is a clear association between the age of selection and the number of programmes for 15-year-olds. In selective education systems the number of programmes available for 15-year-olds ranges from two in Greece and Japan and the partner countries Chile and Thailand to five in the Czech Republic and the partner country Bulgaria. On average, there are three programmes in systems where selection starts at age fourteen or fifteen and nearly four in systems where selection starts even earlier. There are 14 single-programme education systems in which the first student selection takes place after the age of 15. The correlation between the age of selection and the number of educational programmes available to 15-year-olds is very strong: -0.90 in the OECD countries and -0.87 for all PISA countries (Table 4.4). Therefore, the age of selection can be used as a valid indicator for institutional differentiation and is used to group the countries in this analysis.

Classification of education systems by degree of institutional differentiation

There are three groups of countries presented in this analysis. Note that the countries are grouped by the first formal age of selection within each education system. In actual practice, a considerable number of the students within a given country may not yet have been selected for distinct educational programmes. In Ireland, for example, students at the end of 9th grade have four programme options, some of which converge again at the end of grade 10. However, many 15-year-olds in Ireland had not yet reached the end of grade 9, and therefore still followed a common programme. Moreover, the first formal age of selection may only apply to certain regions of a country (*e.g.* Germany) and sometimes only to a minority of students (*e.g.* the Czech Republic and Hungary).

Box 4.2 Four measures of realised educational differentiation in PISA 2000

Percentage of students in general programmes

The selection for general and vocational programmes is generally considered to be a crucial aspect of educational differentiation. In PISA 2000, students were asked to report which programme they were in at school. The programmes were then classified according to the International Standard Classification of Education (ISCED-97) as follows:

- **ISCED 2A** – A lower secondary programme designed to prepare students for further study at the upper secondary level in either an ISCED 3A or 3B programme in a sequence that would ultimately lead to tertiary education.
- **ISCED 2B** – A lower secondary programme designed to introduce students to the world of work as preparation for further vocational or technical education at the upper secondary level (ISCED 3C).
- **ISCED 2C** – A lower secondary programme designed to prepare students for direct entry, without further training, into the labour market.
- **ISCED 3A** – An upper secondary programme designed to prepare students for further study at the tertiary level in an ISCED 5A programme (university).
- **ISCED 3B** – An upper secondary programme designed to prepare students for further study at the tertiary level in an ISCED 5B programme (non-university).
- **ISCED 3C** - An upper secondary programme designed to prepare students for direct entry, without further training, into the labour market. Students could also go on to follow an ISCED 3A or 3B programme.

Where appropriate, ISCED 2A (lower secondary) and ISCED 3A (upper secondary) are considered to be general programmes in this analysis. ISCED defines general programmes as not being explicitly designed to prepare students for a specific class of occupations or trades or for entry into further vocational/technical education programmes. Less than 25 per cent of the programme content is vocational or technical. Some students may be enrolled in ISCED 2A or 3A programmes that are vocationally oriented. This proxy may lead to an underestimate of the percentage of students enrolled in vocational programmes in Austria, Belgium, the Czech Republic, Hungary, Ireland and Italy.

Proportion of between-school variance in reading performance

The proportion of between-school variance in student performance was obtained through multilevel analysis and measures the between-school variance expressed as a percentage of total variance in student performance within a country. Total variance for each country in reading literacy scores can be accounted for by differences between schools and differences between students within schools.

Proportion of between-school variance in average school socio-economic status

This measure indicates how much the average socio-economic composition of schools varies in each country. The average socio-economic status of each school is the average of the highest occupational status of either of the parents for each student within the school.

Variation in grade levels

The amount of variation in grade levels of 15-year-olds for each country was estimated by calculating the standard deviation in the grade levels as reported by the students. This measure provides an (indirect) indication of grade repetition, which is an attempt to match curriculum content and student performance. As such, it must also be considered as a form of differentiation. However, this measure is also affected by the degree to which students enter school later or earlier than the statutory entry age.

No selection: The first group of countries comprises education systems in which all 15-year-old students are still enrolled in the same educational programme. Of the 14 countries in this group, 11 are OECD countries. The group includes the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden) and the predominantly English-speaking countries (Australia, Canada, New Zealand, the United Kingdom and the United States), as well as the education systems of Spain and the partner countries Brazil, Hong Kong-China and Indonesia.

Selection at the age of 14 or 15: The second group of countries comprises education systems in which selection into distinct types of institution or educational programme starts at the age of fourteen or fifteen. Eight of the 17 countries in this group are OECD countries (Greece, Ireland, Italy, Japan, Korea, Poland, Portugal and Switzerland) while nine are partner countries (Albania, Argentina, Bulgaria, Chile, Latvia, FYR Macedonia, Peru, the Russian Federation and Thailand).

Selection before the age of 14: The third group of countries comprises education systems in which selection into distinct types of institutions or educational programmes starts before the age of 14. There is much variation in the age of selection within this group. The earliest first formal age of selection is in Austria and Germany (ten years) and the Czech Republic and Hungary (11 years). The majority of countries in this group first select students at the age of 12 (Belgium, Mexico, the Netherlands and the partner country Israel).

How does institutional differentiation relate to equity?

Impact of institutional differentiation on equity at the school level

Using age of selection as an indicator of institutional differentiation, considerably larger performance differences among schools in systems where students are selected for different programmes than in systems without such selection would seem to be likely. However, it is possible that only relatively small proportions of students within a school are channelled into certain programmes, and hence variation among schools could be relatively small despite the selection by performance. Similarly, in education systems with no institutional differentiation according to this indicator, there could still be considerable differences among schools, both with regard to student characteristics and student performance. Therefore, the proportion of between-school variance in student performance in reading literacy must be considered as the main indicator of actual institutional differentiation.

Variation among schools in student performance in reading literacy

As would be expected, Figure 4.1 shows that the proportion of between-school variance in student performance in reading literacy is considerably lower in systems where the 15-year-old students have not yet been selected for different programmes (17 per cent on average in the OECD countries). In countries where selection takes place before the age of fourteen, the proportion of between-school variance in student performance in reading literacy is highest (55 per cent on average in the OECD countries). The relationship between the age of selection and the proportion of between-school variance in student performance in reading literacy is very strong: -0.83 in the OECD countries and -0.68 for all PISA countries (Table 4.4).

Variation among schools in school composition

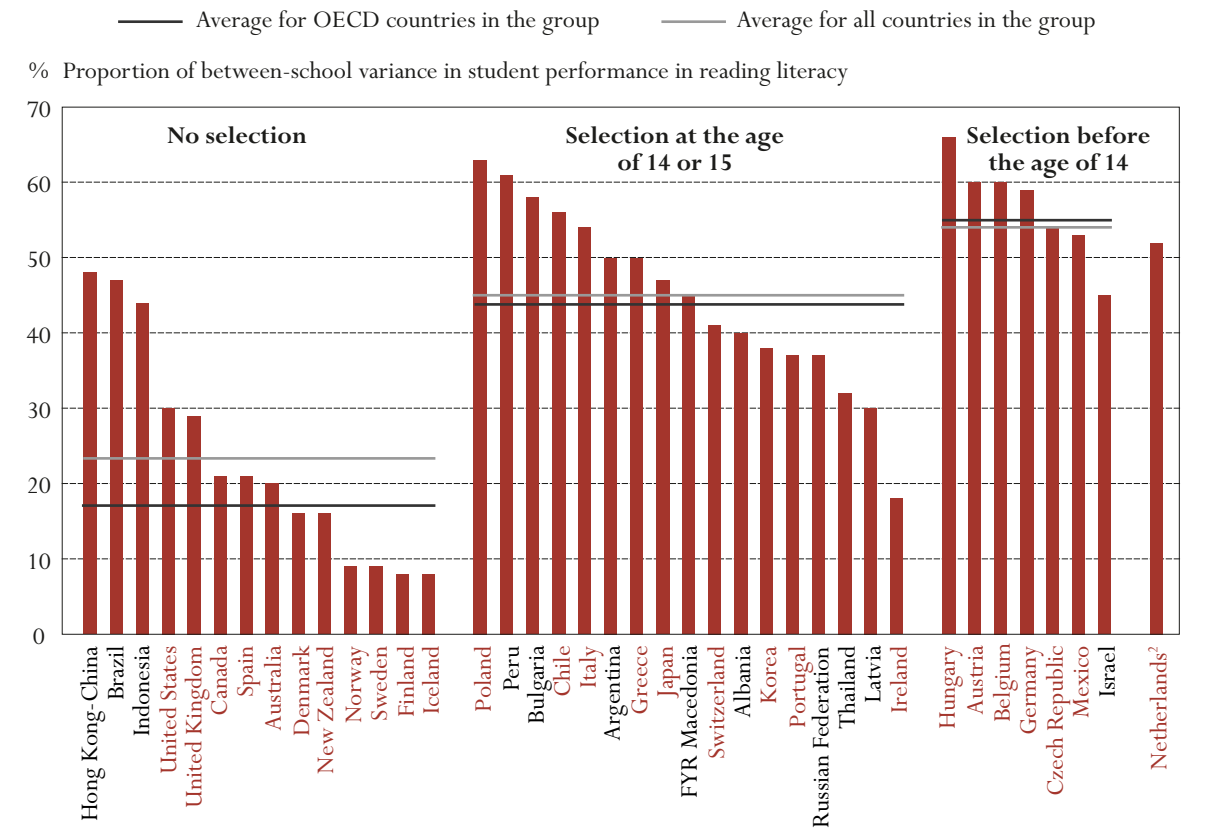
Given the substantial relationship between student characteristics and student performance, one might also expect that performance differences among schools would coincide with different levels of average school socio-economic status, that is, the school composition. Figure 4.2 shows comparatively the highest levels of between-school variance in average school socio-economic status in systems where selection takes place

before the age of fourteen (28 per cent on average in the OECD countries). Although the average variance in the OECD countries with comprehensive systems is lower (19 per cent) than in selective systems, this proportion is higher than the proportion of between-school variance in student performance in reading literacy for comprehensive systems. In particular, the proportion of variation in student performance in reading literacy among schools is lower than the proportion of variation in average school socio-economic status among schools in Australia, Denmark, Finland, Iceland, Norway, Spain and Sweden, and is the same for New Zealand. However, the correlation between both types of between-school variance is very high: 0.80 for the OECD countries and 0.67 for all PISA countries (Table 4.4).

Figure 4.1

Variation among schools in student performance in reading literacy for education systems grouped by age of selection

Between-school variance in student performance in reading literacy expressed as a percentage of the total variation in student performance in reading literacy[1], by age of selection (no selection, selection at the age of 14 or 15 and selection before the age of 14)



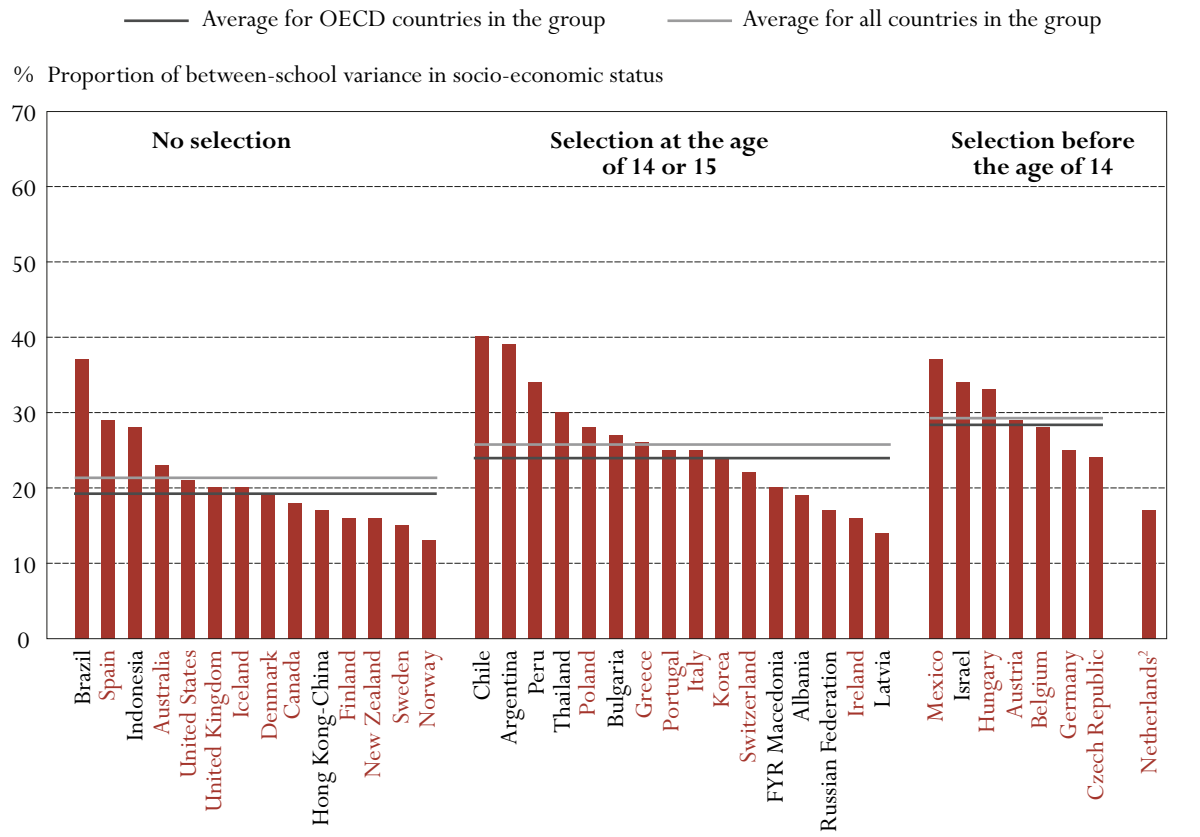
1. This index is often referred to as the intra-class correlation (rho).
2. Response rate too low to ensure comparability.

Source: OECD PISA database. Tables 4.1, 4.6a and 4.6b.

Figure 4.2

Variation among schools in average school socio-economic status for education systems grouped by age of selection

Between-school variance in parents' occupational status (HISEI) expressed as the percentage of the total variation in parents' occupational status (HISEI),[1] by age of selection (no selection, selection at the age of 14 or 15 and selection before the age of 14)



1. This index is often referred to as the intra-class correlation (rho).
2. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 4.1, 4.6a and 4.6b.

Variation in grade levels

The standard deviation in grade levels provides an (indirect) indication of grade repetition, which can be considered as a form of internal differentiation. Figure 4.3 shows the amount of variation in grade levels for each country. The average standard deviation for the OECD countries where 15-year-olds have not been selected for a particular educational programme or institution is 0.35, and for the OECD countries where selection has taken place before the age of 14 the average standard deviation is 0.67. The relationship between the age of selection and the average standard deviation in grade levels is statistically significant for the OECD countries with a correlation of -0.48 (Table 4.4). There is therefore a relatively strong association between institutional differentiation as measured by the age of selection and an increased likelihood for students of the same age to be enrolled in different grade levels.

Impact of institutional differentiation on overall equity in student performance

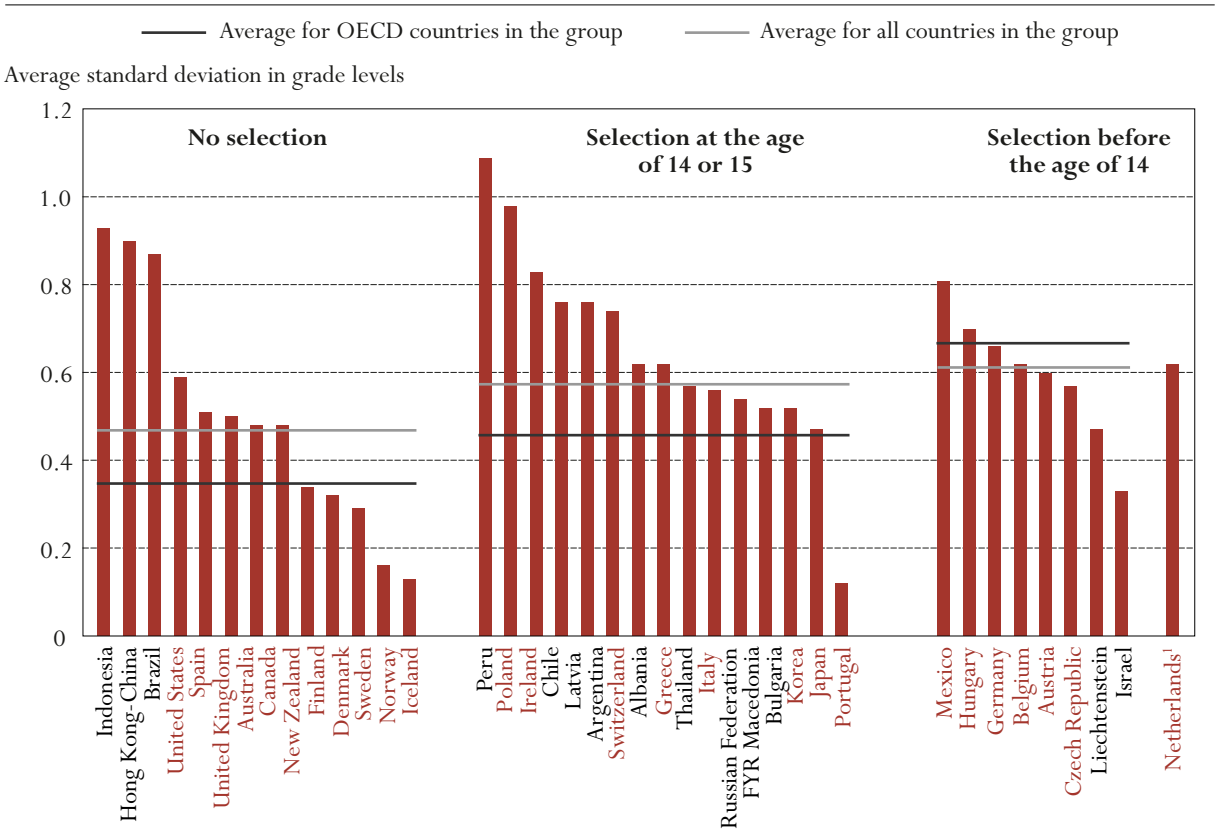
The most commonly used argument against the selection of students for different educational programmes or institutions is the negative impact this has on equity in educational outcomes. However, is this really the

case? While PISA cannot establish the causal direction of the selection and increased inequity, it can shed light on whether or not selective education systems tend to have lower equity in student performance. As mentioned earlier, equity can be defined by two measures: (1) the variation in student performance in reading literacy, and (2) the correlation between students' family background and student performance. The analysis in Chapter 2 of the total variation among students in performance in reading literacy shows that there is a very different pattern across the PISA countries. Many countries in which there is relatively low between-school variance have high overall variation among students, and vice versa (Figures 2.2 and 2.3). However, is there nevertheless an association between institutional differentiation and lower equity in student performance? Figure 4.4 shows the standard deviation in student performance in reading literacy for the three groups of countries. In the OECD countries, the average standard deviation for the group of countries with no selection is not statistically significantly lower than the average standard deviation for the group where selection begins before the age of 14 (97 and 98, respectively), and the average for the group of countries where selection takes place at the age of 14 or 15 is lowest (92). The common sense expectation that institutional differentiation enhances variation in student performance is not confirmed when inequity and equity are measured by variation in student performance in reading literacy in PISA 2000. None of the six indicators of educational differentiation show a significant correlation with the standard deviation in reading literacy (Table 4.5).

Figure 4.3

Variation in grade levels for 15-year-old students enrolled in education systems grouped by age of selection

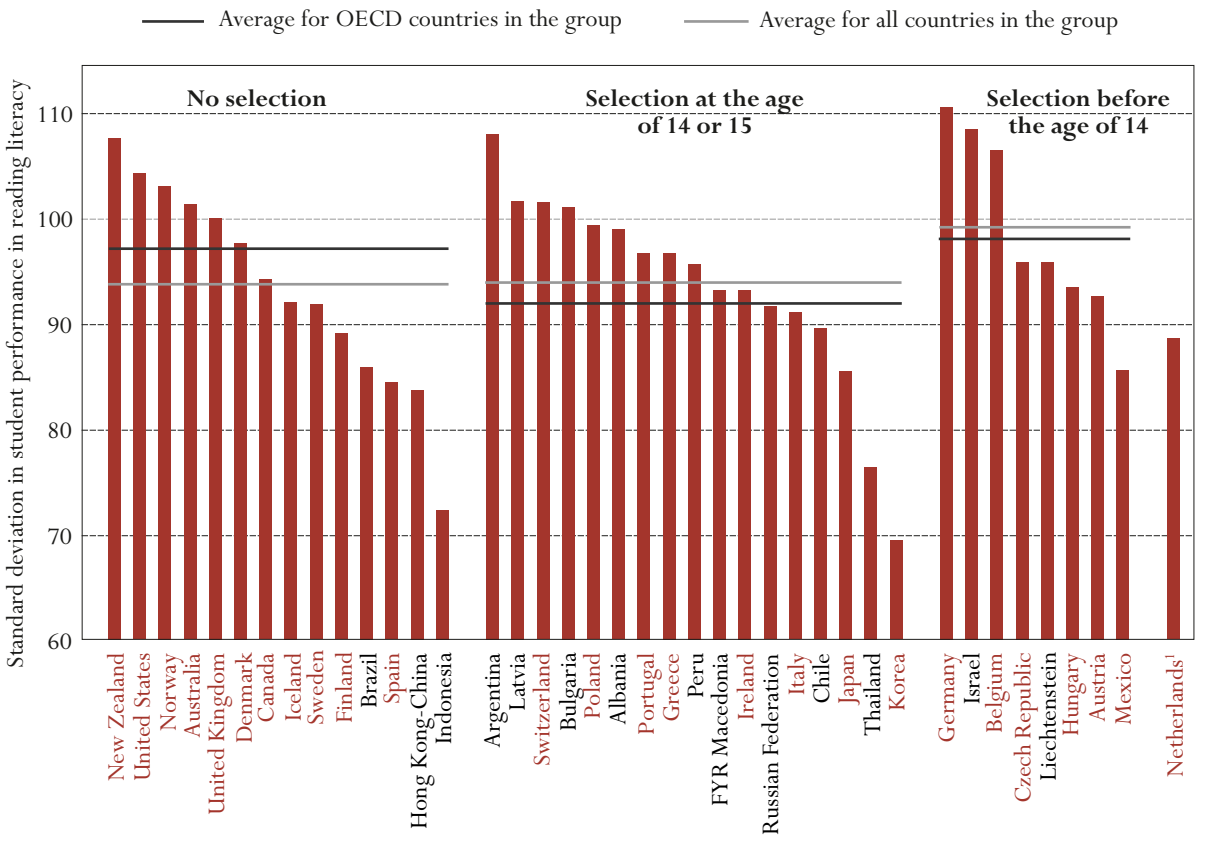
Average standard deviation in grade levels of 15-year-olds



1. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 4.1, 4.6a and 4.6b.

Figure 4.4

Standard deviation in student performance in reading literacy for education systems grouped by age of selection



1. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 4.1, 4.6a and 4.6b.

However, when equity is measured by the correlation between parents' occupational status and student performance, the common sense expectation is confirmed. Five out of six indicators of educational differentiation show positive statistically significant relationships with the impact of parents' occupational status on reading performance (Table 4.5). The only exception is the percentage of students in vocational programmes. Figure 4.5 presents the correlation between parents' occupational status and reading performance in each country, comparing comprehensive and selective education systems. The figure shows that in countries where selection starts at an early age, the correlation between students' socio-economic background and students' performance is stronger. In this sense, the PISA 2000 database provides a clear confirmation for the expectation that differentiation increases inequity.

Education systems with the highest level of institutional differentiation increase the variation of student performance among schools, as well as the variation in levels of average school socio-economic status. However, the group of education systems with the lowest level of institutional differentiation has a slightly lower average proportion of between-school variance in student performance in reading literacy than the proportion of between-school variance in average school socio-economic status. Therefore, performance differences among schools are lower than differences in school composition. On average, the standard

deviation in grade levels is also higher in selective education systems. However, there is not a clear relationship between institutional differentiation and variation in overall student performance among countries.

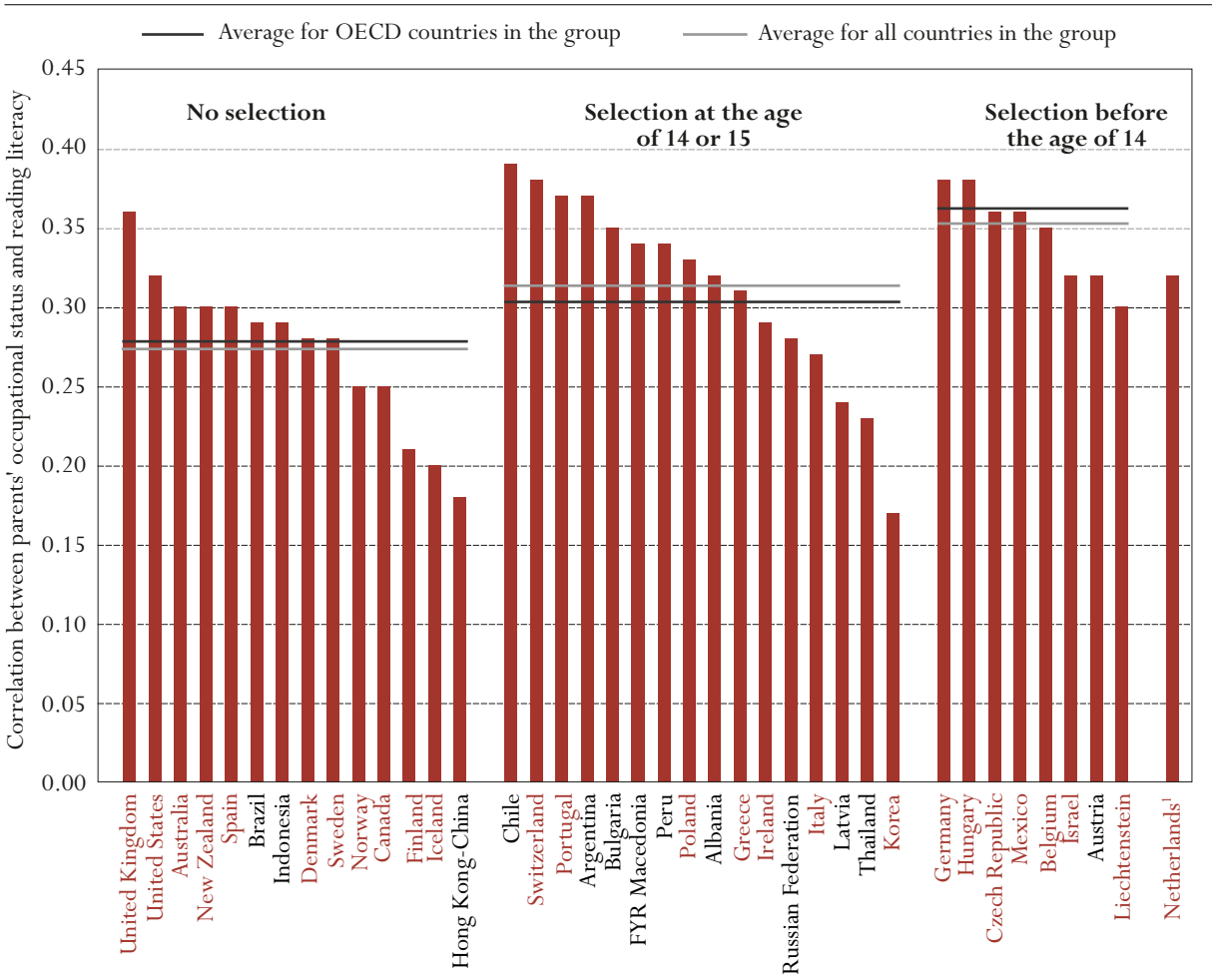
How does institutional differentiation relate to quality?

Impact of institutional differentiation on overall quality of student performance

Selective education systems aim to improve the quality of educational outcomes by grouping students of similar academic levels together. Using the mean student performance in reading literacy from PISA 2000 as a measure of quality, Figure 4.6 displays the average realised quality for the three groups of education systems. There are clear differences between the three groups of education systems, but the direction of the relationship is opposite to the one that is usually asserted by proponents of grouping students by level of performance. In the OECD countries, mean performance in reading literacy is highest in systems

Figure 4.5

Correlation between parents' occupational status (HISEI) and student performance in reading literacy for education systems grouped by age of selection

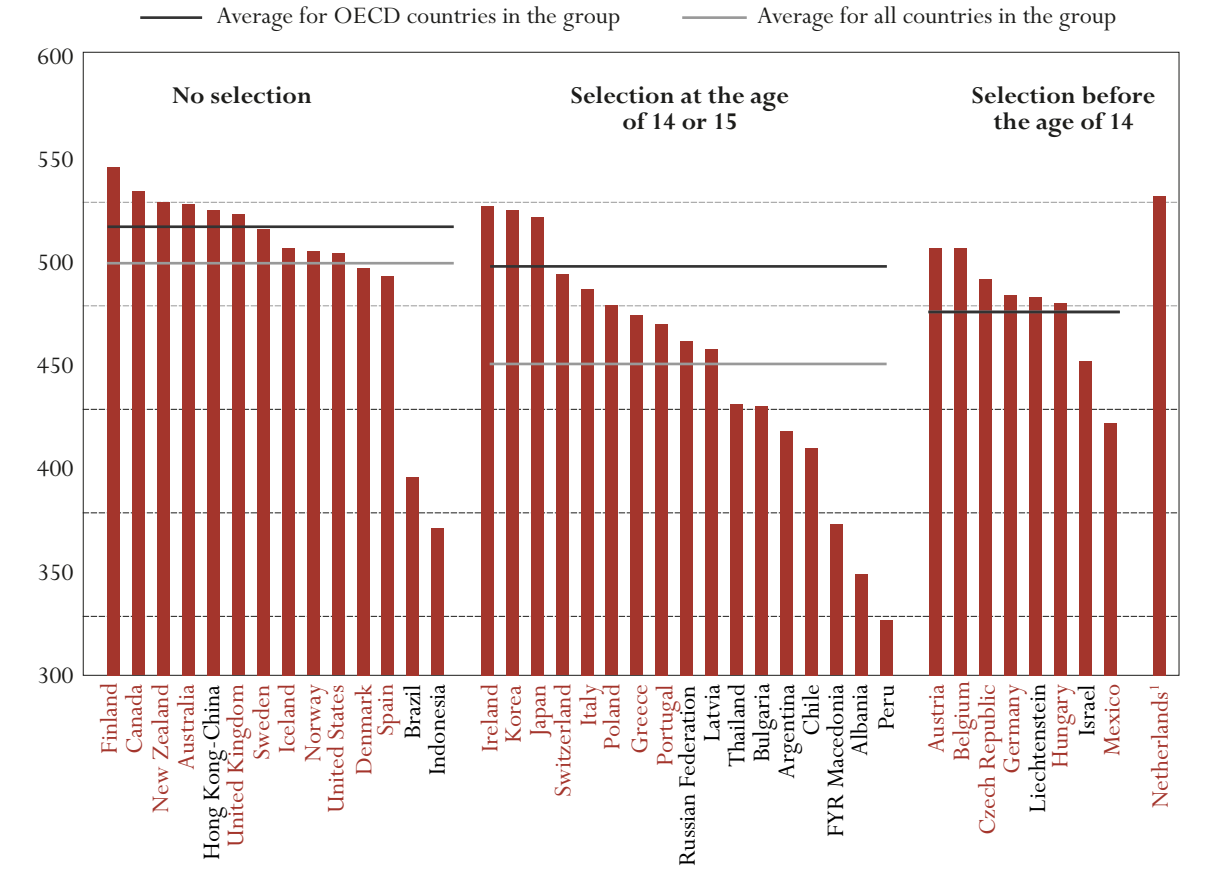


1. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 4.2, 4.6a and 4.6b.

Figure 4.6

Mean student performance in reading literacy in education systems grouped by age of selection

Averages for mean student performance in reading literacy for education systems with no selection, selection at the age of 14 or 15 and selection before the age of 14



1. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 4.2, 4.6a and 4.6b.

where 15-year-olds have not yet been selected (517 score points on average) and lowest in countries where selection starts before the age of fourteen (476 score points on average). This difference of 41 score points in the PISA assessment in reading literacy is quite significant. A difference of 73 score points on the PISA scale represents one proficiency level in reading literacy, and there is a gap of 48 score points between the fifth highest and the fifth lowest OECD countries. The relationship between institutional differentiation and quality is very strong for the OECD countries (correlation of 0.59 between age of selection and mean student performance in reading literacy).

Impact of institutional differentiation on quality at the school level

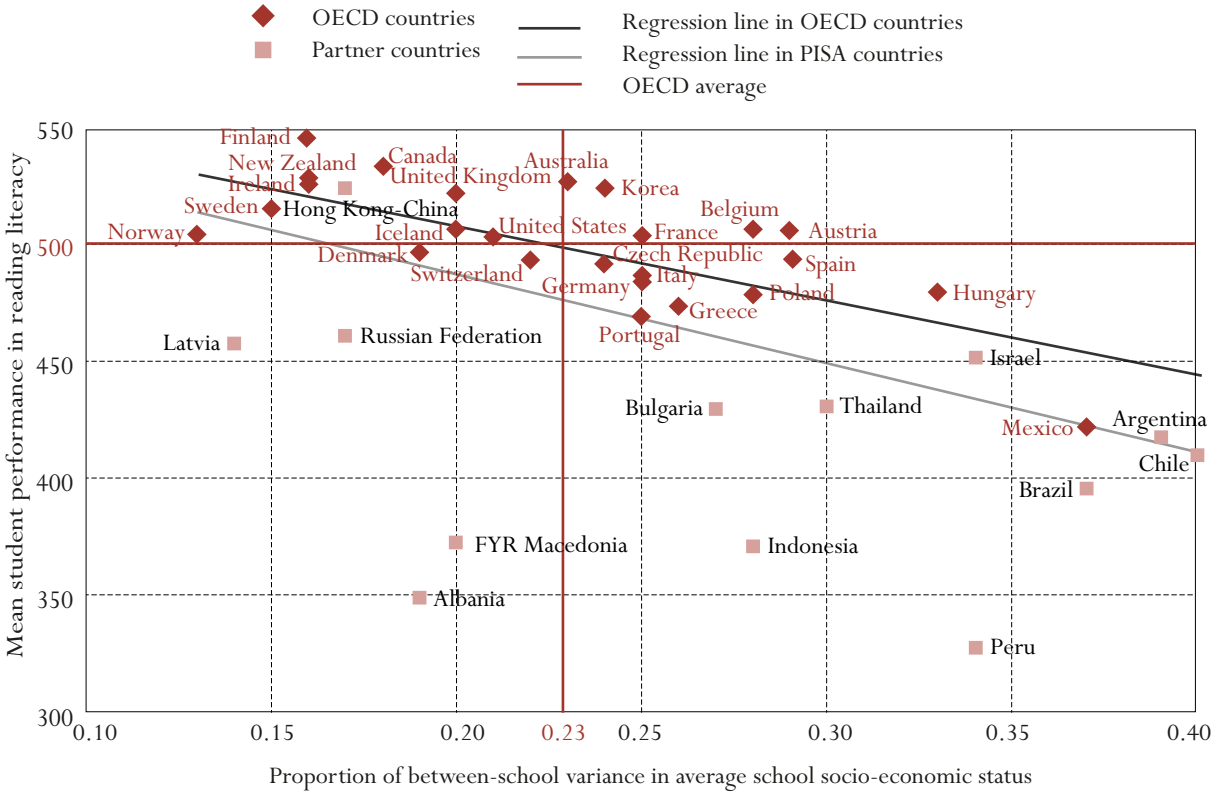
Variation among schools in average school socio-economic status and quality

Figure 4.2 shows that education systems with higher levels of institutional differentiation tend to have higher variation among schools in average school socio-economic status. How does the variation among schools in school composition relate to quality? Figure 4.7 shows the relationship between mean student performance in reading literacy and the proportion of between-school variance in average school socio-

economic status. There is a clear decline in performance as the variation among schools in average school socio-economic status increases, with a correlation of -0.65 for the OECD countries (Table 4.5). In the top right quarter of Figure 4.7, Austria and Belgium present exceptions to the average relationship for the OECD countries, showing above average proportion of between-school variance in average school socio-economic status, but above average student performance in reading literacy. Australia and Korea present another example: mean student performance in both countries is comparatively highest across the OECD countries, yet both countries have above average between-school variance in average school socio-economic status. The Czech Republic, Germany, Greece, Hungary, Italy, Poland, Portugal and Spain, and the partner country Israel, all have comparatively low mean student performance in reading literacy and comparatively high proportions of between-school variance in average school socio-economic status. This relationship is even stronger in Mexico and the partner countries Argentina, Brazil, Chile and Peru (bottom right quarter of Figure 4.7). The relationship between mean student performance in reading literacy and the proportion of between-school variance in student performance in reading literacy is similar, although not quite so strong, with a correlation of -0.49 on average in the OECD countries (Table 4.5). This implies that on average, mean student performance in reading literacy tends to be lower in education systems with a high degree of variation in student performance among schools.

Figure 4.7

Relationship between proportion of between-school variance in average school socio-economic status and mean student performance in reading literacy



Source: OECD PISA database. Tables 4.1 and 4.2.

Standard deviation in grade levels and quality

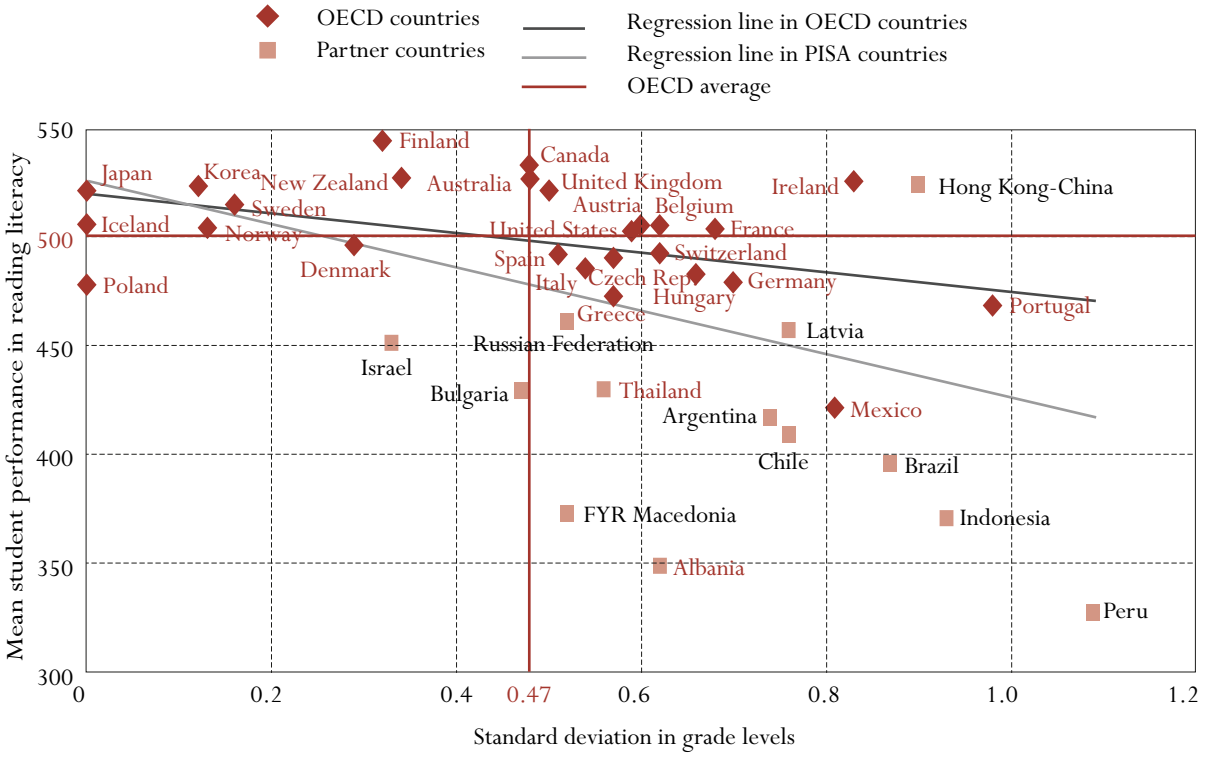
Figure 4.3 shows a relatively strong association between institutional differentiation and variation in grade levels. This aspect of educational differentiation tends to coincide with relatively low performance as well, as shown in Figure 4.8. However, the picture is more ambiguous as standard deviation in grade levels correlates less strongly with student performance than with variation among schools regarding socio-economic status, with correlations of -0.43 and 0.69 respectively (Table 4.5). In particular, countries such as Ireland[1] and the partner country Hong Kong-China have comparatively high standard deviation in grade levels and above average student performance in reading. There seems to be a high degree of internal differentiation within some comprehensive education systems. Australia,[2] Canada, the United Kingdom and the United States all have above-average standard deviation in grade levels and above-average student performance in reading literacy (top right quarter of Figure 4.8).

Percentage of students in general programmes and quality

The percentage of PISA 2000 students in general programmes is significantly correlated with the age of selection (Table 4.4). Figure 4.9 shows a selection of countries in which more than one per cent of students participating in PISA 2000 were enrolled in vocational programmes. The scale on the right of the graph shows the percentages of students enrolled in vocational programmes for each country. Clearly, for some countries the percentage of students enrolled in vocational programmes is a form of differentiation that is independent from the age of selection. Many students are enrolled in vocational programmes in some countries with comprehensive systems (such as Australia and the partner country Hong Kong-China). It is

Figure 4.8

Relationship between standard deviation in grade levels and mean student performance in reading literacy



Source: OECD PISA database. Tables 4.1 and 4.2.

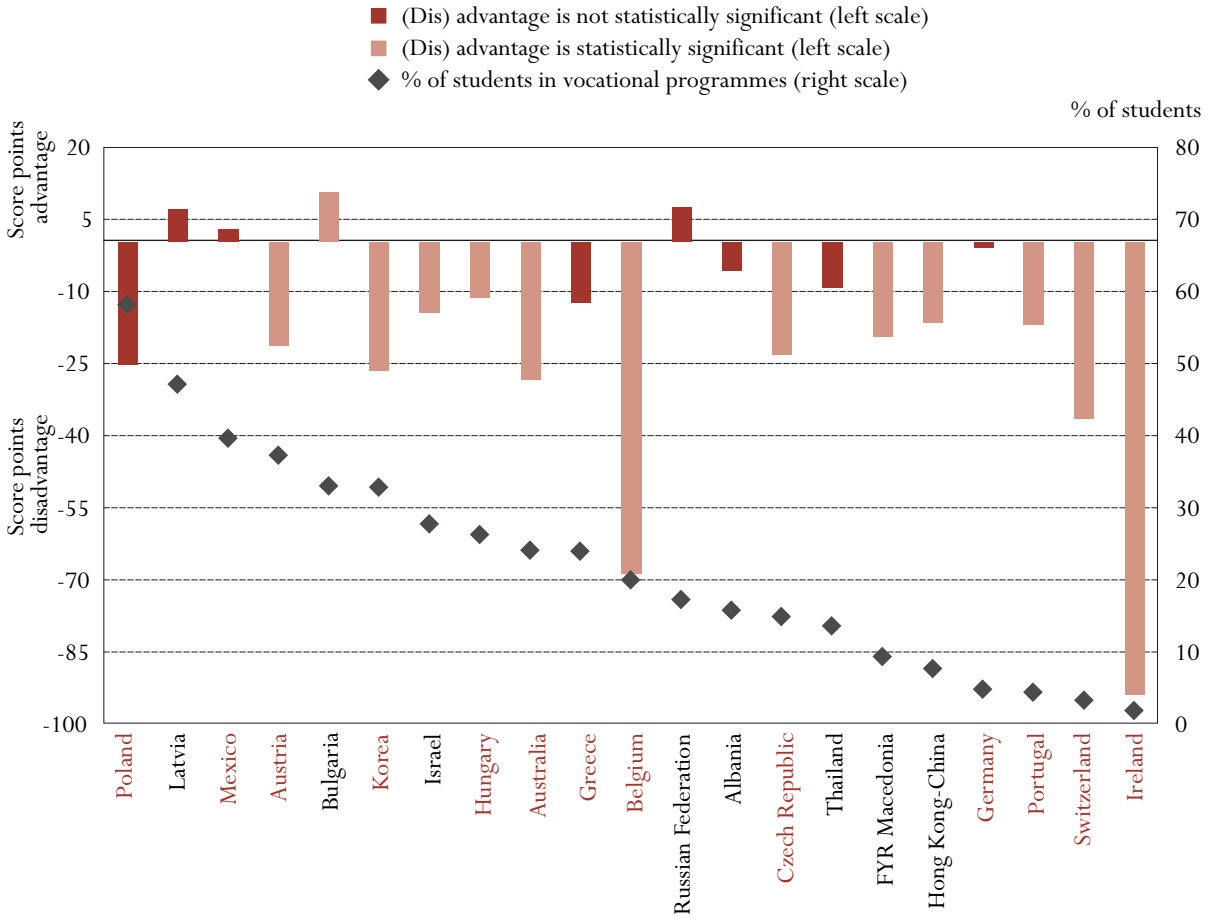
also true that most countries with selective systems still have the majority of students enrolled in general programmes. The only exception is Poland, where 58 per cent of students are enrolled in vocational programmes. However, on average there does tend to be a higher percentage of students enrolled in vocational programmes in selective systems. The group of countries in which selection starts before the age of 14, has 23 per cent of students enrolled in vocational programmes and in countries in which selection starts at the age of 14 or 15 this percentage is slightly lower (18%).

Is there a difference in the performance of students enrolled in vocational programmes? Figure 4.9 shows the score points advantage or disadvantage for students enrolled in vocational programmes (left scale), as well as the percentage of students enrolled in vocational programmes (right scale). For 13 out of 21 countries there is a statistically significant difference in performance levels of students enrolled in vocational programmes compared to students enrolled in general programmes. Bulgaria is the only country in which students enrolled in vocational programmes have a statistically significant performance advantage (10 points). For the

Figure 4.9

Performance (dis)advantage for students in vocational programmes and percentage of students in vocational programmes

Regression coefficients for students in ISCED 2B, 2C, 3B or 3C (vocational) programmes showing a negative or positive contrast to students in 2A or 3A (general) programmes



Note: Countries are ranked in descending order of the percentage of students enrolled in vocational programmes.
Source: OECD PISA database.

remaining 12 countries students enrolled in vocational programmes have a performance disadvantage ranging from 12 score points in Hungary to 94 score points in Ireland. However, in Ireland and Switzerland where the score point disadvantage for students is comparatively high, less than 5 per cent of students are enrolled in vocational programmes. In contrast, Belgium has 20 per cent of students enrolled in vocational programmes with a performance disadvantage of 69 score points. This clearly explains much of the variation among students in Belgium. Similarly, Austria and Korea have over 30 per cent of students enrolled in vocational programmes with a performance disadvantage of over 20 score points, and in Australia over 20 per cent of students are enrolled in vocational programmes and have a performance disadvantage of 24 score points.

In summary, the relationship between quality and the degree of institutional differentiation is in fact negative, contrary to the belief that institutional differentiation promotes quality at the expense of equity. Countries with selective education systems, on average, perform less well than countries with more comprehensive education systems. The more schools are differentiated in terms of their socio-economic composition, the lower the mean student performance in reading literacy. Education systems with more differentiation in terms of grade levels also tend to perform less well – although this relationship is not as strong. Finally, in many countries students enrolled in vocational programmes perform significantly less well in reading literacy than students enrolled in general programmes.

Conclusions

The classification of PISA countries by the degree of institutional differentiation in their education systems shows many revealing results. The findings from PISA 2000 show that education systems with the lowest degree of differentiation achieve the highest mean student performance in reading literacy. Education systems with the highest degree of institutional differentiation sort students of similar ability into the same type of programmes or institutions in order to adequately deal with the wide range of variation in performance among students in secondary education. Systems offering just one programme are perceived by supporters of selective education systems as inadequate in meeting the needs of higher- or lower-performing students. In reality, single programme systems often offer a wide range of educational choices to students and sometimes even allow students to take examinations at different levels. All of this gives students the possibility to set up highly individual programmes. Perhaps single-programme systems are actually more flexible in matching curriculum content to students' needs than selective education systems that provide a limited number of programmes. This ability to better deal with individual differences among students might explain the higher performance levels in PISA for these countries.

PISA 2000 also reveals that comprehensive education systems are not always more equitable in terms of variation in performance in reading literacy among students. There was no statistically significant difference between the average standard deviation in student performance of the countries with comprehensive education systems and the countries with the highest degree of institutional differentiation. However, the group of countries with differentiated education systems are less equitable in terms of the impact that student socio-economic background had on performance. Perhaps surprisingly, the PISA 2000 findings show more solid evidence for integrated, comprehensive school systems being high performers rather than champions of equity.

Notes

1. Grade 10 in Ireland is optional. This effectively increases the range of grade levels by one year.
2. Australia has a high standard deviation in grade levels due to the fact that the States and Territories have different school starting ages. In this case, therefore, high standard deviation in grade levels does not reflect a high rate of grade repetition.

Chapter

5

DECENTRALISED DECISION MAKING, PRIVATISATION AND STUDENT PERFORMANCE

Introduction

Over the past two decades, many countries have been engaged in a shift of decision-making authority to lower administrative levels, either to local or regional governments, or to schools. This move towards decentralisation is a global phenomenon, affecting developing as well as industrialised countries, although the motives and incentives are diverse. The increased attention for decentralisation in education is perhaps best reflected by the numerous initiatives to stimulate decision making by schools, such as site- or school-based management (SBM), the local management of schools and the establishment of relatively autonomous schools like the charter schools in the United States. This widespread trend towards school autonomy has also stimulated the debate about the advantages and disadvantages of private schooling. These debates are inspired by micro-economic theory and ideas about the application of market mechanisms such as choice and competition in education (Chubb and Moe, 1990).

This chapter analyses information reported by school principals in PISA 2000 on both decentralisation and privatisation. First, the chapter presents the degree of autonomy schools enjoy in four domains of decision making and then sheds light on the extent to which these responsibilities at the school level are actually distributed within schools. Second, the chapter presents evidence on the impact of educational decentralisation and of privatisation on student performance in reading literacy.

Educational decentralisation

The motives for educational decentralisation are manifold and vary from country to country. Frequently mentioned expectations are increased efficiency and improved financial control, a reduction of bureaucracy, a restoration of the confidence in government through a redistribution of authority, an increased responsiveness to local communities, creative management of human resources, improved potential for innovation and, as an overarching aspiration, the creation of conditions that provide more incentives for schools to improve their own quality. The rationale behind most of these motives is the assumption that schools are best equipped to enhance the quality of education themselves and that this will result in higher student achievement and a lower drop-out rate. Moreover, at least in some countries, it is believed that schools, once given more freedom from central bureaucratic control, will regain their position in the centre of the community and contribute to social cohesion (Fiske, 1996).

Critics of educational decentralisation argue that it will hardly affect teachers' daily work with their students. Whether regulations are set by central government, by the school board or even by the school principal makes no real difference for those who work directly with students. It is argued that autonomy will put an extra burden on the members of the school board and the principal. In its turn, this might result in an increase of support staff within schools and a stronger focus of the school principal on administrative rather than on educational issues. Furthermore, school autonomy may have a negative effect on equity, by favouring groups in society that are already advantaged. In order to take advantage of the benefits of educational decentralisation and to counter negative side effects, most countries have searched for a mix of balancing centralised and decentralised components in their education system (Wößmann, 2000).

Different aspects of educational decentralisation

Decentralisation is generally defined in terms of the level of the system at which decisions are taken. In this chapter, two aspects of decentralisation are considered: the domains of decision making and the levels of decision making.

Domains of decision making

Decisions on school processes may concern a variety of aspects. Decisions are taken in the administrative domain, such as decisions on financial budgets or the recruitment and selection of school personnel, or in the educational domain, such as decisions on courses, textbooks or pedagogical issues. For this chapter, a classification of four domains of decision making is used: personnel management, financial resources, student policies, and curriculum and instruction. Box 5.1 summarises the four domains.

Box 5.1 The four domains of decision making

Personnel management	Student policies
Appointing teachers Dismissing teachers Establishing teachers' starting salaries Determining teachers' salary increases	Establishing student disciplinary policies Establishing student assessment policies Approving students for admittance to school
Financial resources	**Curriculum and instruction**
Formulating the school budget Allocating budget within the school	Choosing which textbooks are used Determining course content Deciding which courses are offered

Levels of decision making

The level at which decisions are taken is often referred to as the locus of decision making. It must first be established whether a school has decision-making authority, *i.e.* does the school have a degree of autonomy? PISA 2000 data indicate whether schools have some degree of autonomy in certain domains, and also provide insight into the question as to which persons within the schools have responsibility. This chapter identifies four levels within the school: the elected or appointed school board, the school principal, the department head, and the teachers. It should be borne in mind, however, that in some countries school-level decision making may be heavily guided by a framework set by a higher level of government, whereas in other countries these decisions may be taken more freely.

Levels of school autonomy in the four domains of decision making

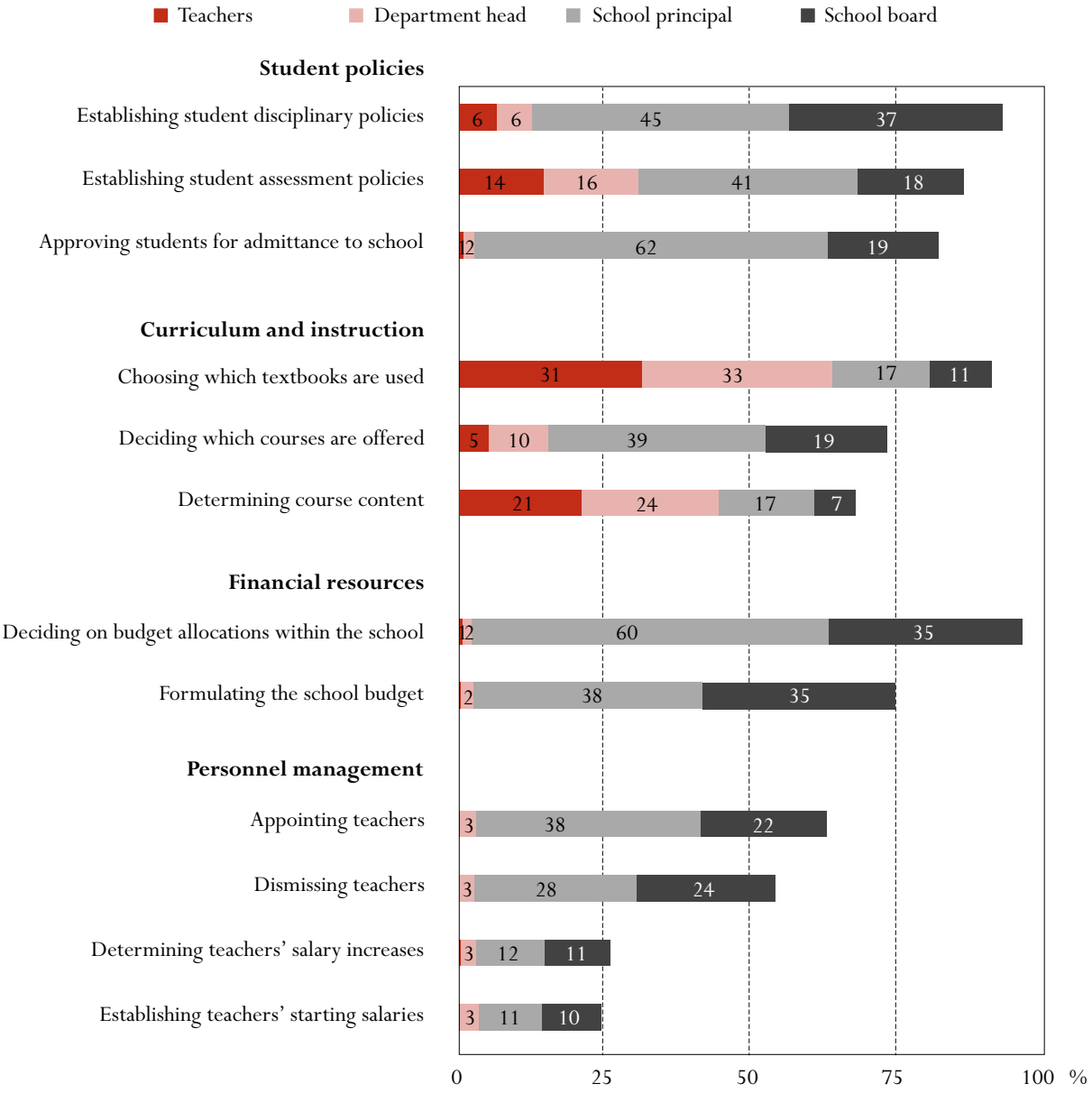
Degree of school autonomy

Figure 5.1 shows the average proportion of 15-year-olds assessed in OECD countries who are enrolled in schools that have, according to the reports of their school principals, some degree of autonomy in the four decision-making domains. In other words, the length of the bar shows the degree of school autonomy, whereas the colours show the locus of authority within the school. In terms of the degree of school autonomy, over 80 per cent of students attend schools that have responsibility for student disciplinary policies, student assessment policies, student admissions, the choice of textbooks and budget allocations, whereas only around 25 per cent of students are in schools that have responsibility for teachers' salary increases and teachers' starting salaries.

Figure 5.1

Responsibility at the school level in OECD countries for student policies, curriculum and instruction, financial resources, and personnel management

Mean distribution in OECD countries on average of percentages of students enrolled in schools where principals report that teachers, the department head, the principal or the school board have some responsibility for the following aspects of school policy and management



Source: OECD PISA database. Table 5.1.

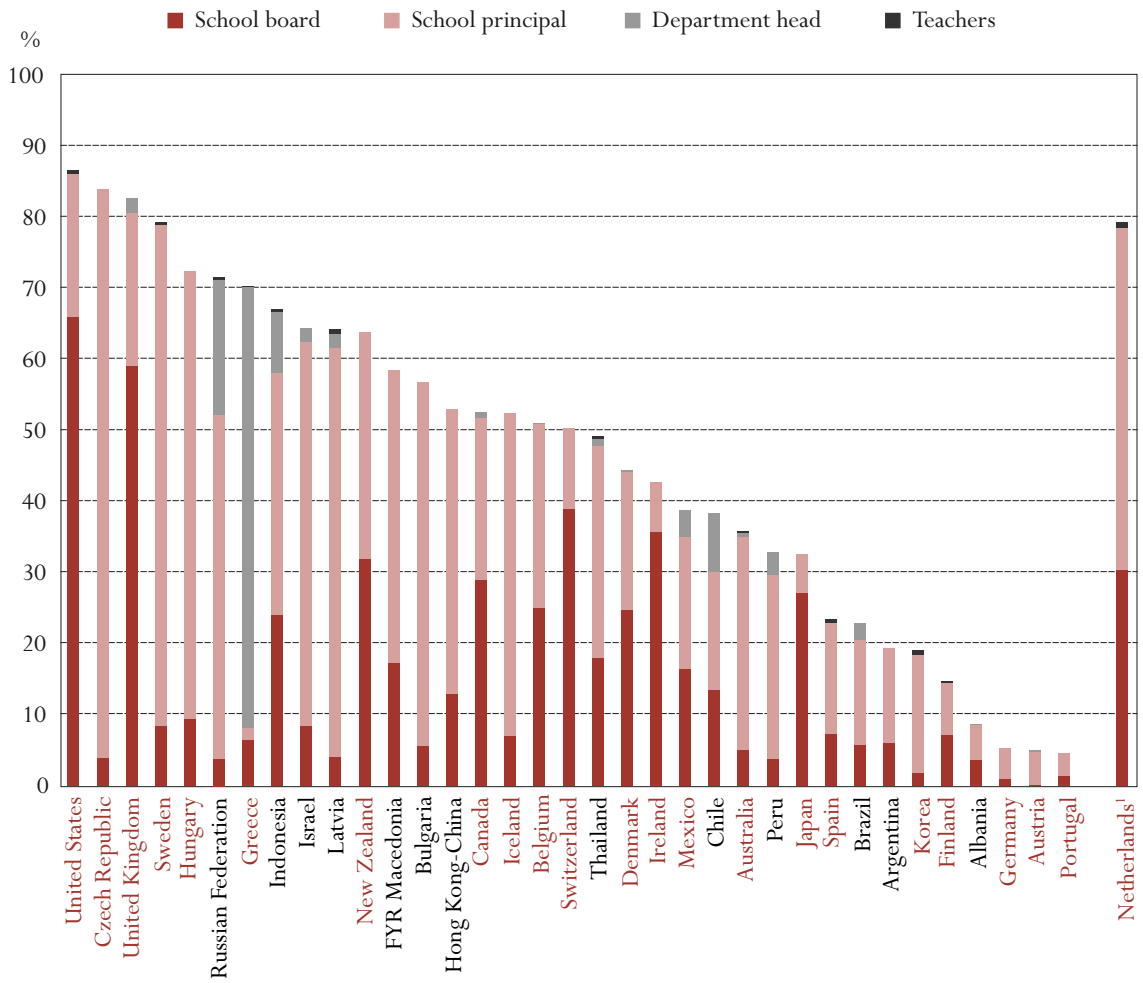
Locus of decision making within the school for different domains

Figures 5.2 to 5.5 show whether the school principal, school board, department heads or teachers have responsibility within schools for decision making in personnel management, financial resources, student policies and curriculum and instruction for each country.

Figure 5.2

Responsibility for personnel management at the school level

Distribution of mean percentages of students enrolled in schools where principals report that the school board, principal, department head or teachers have some responsibility for personnel management



1. Response rate is too low to ensure comparability.
Source: OECD PISA database. Table 5.2.

Personnel management

In most countries, personnel management issues fall under the responsibility of the principal or the school board. In half of the participating countries over 50 per cent of 15-year-olds are enrolled in schools where the principals report that the school has some responsibility for personnel management. For the majority of countries responsibility for personnel management at the school level lies more with the principals than the school boards (Figure 5.2). Notable exceptions are Belgium, Canada, Denmark, Ireland, Japan, New Zealand, Switzerland, the United Kingdom and the United States. Responsibilities for department heads in personnel management are rather limited according to principals' reports. However, in the partner countries Chile, Indonesia and the Russian Federation, principals report that substantial numbers of 15-year-olds are enrolled in schools where department heads have responsibilities in personnel management (between 8 and 19 per cent) and in Greece principals report that this is the case for the majority of 15-year-olds (62 per cent) .

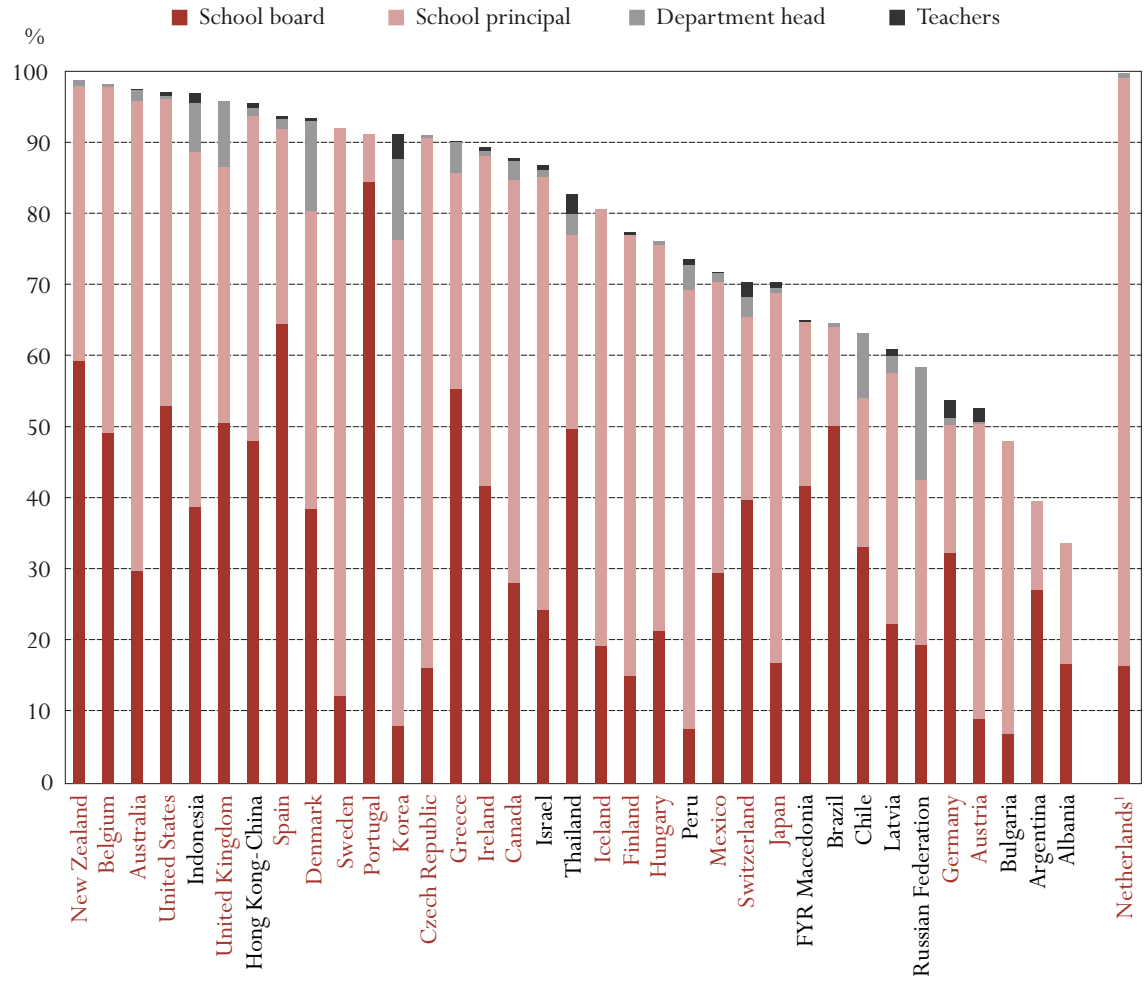
Financial resources

In 32 of the 35 countries with comparable data, over 50 per cent of 15-year-olds are enrolled in schools with some autonomy in the domain of financial resources, and in 14 countries over 90 per cent are. However, there is much variation across countries as to whether the main responsibility lies with the school board or the principal for decisions regarding financial resources made within the school (Figure 5.3). Only in Portugal, Spain and the partner country Brazil are 15-year-old students enrolled in schools in which the school board is clearly more influential than the principal, whereas in Austria, the Czech Republic, Finland, Hungary, Iceland, Japan, Korea and Sweden, and the partner countries Bulgaria, Israel and Peru, the principal has far more responsibility for financial resources. In Denmark, Korea and the United Kingdom, and in the partner countries Chile, Indonesia and the Russian Federation, teachers and department heads are also reported to be responsible to some degree for financial resources (Figure 5.3).

Figure 5.3

Responsibility for financial resources at the school level

Distribution of mean percentages of students enrolled in schools where principals report that the school board, principal, department head or teachers have some responsibility for financial resources

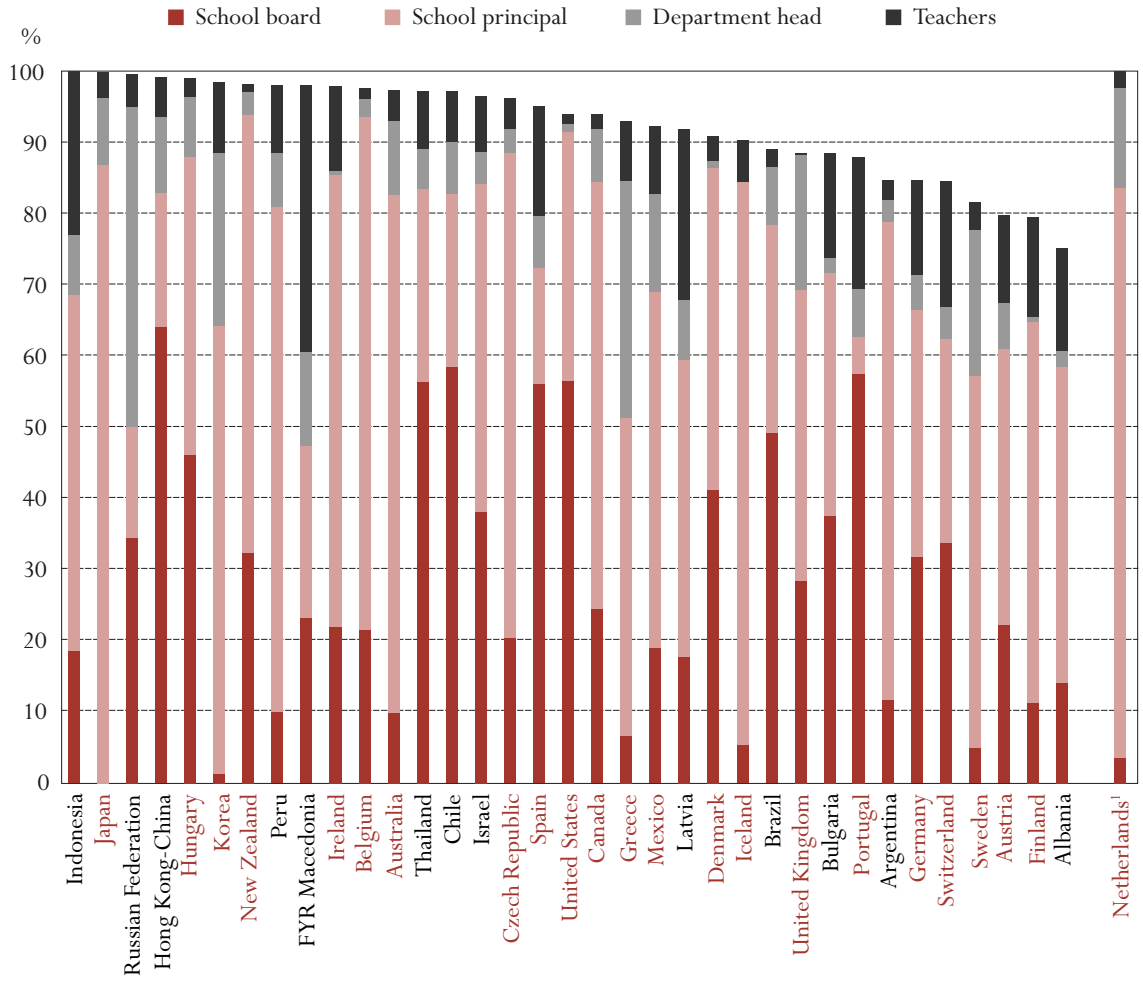


1. Response rate is too low to ensure comparability.
Source: OECD PISA database. Table 5.3.

Figure 5.4

Responsibility for student policies at the school level

Distribution of mean percentages of students enrolled in schools where principals report that the school board, principal, department head or teachers have some responsibility for student policies



1. Response rate is too low to ensure comparability.
Source: OECD PISA database. Table 5.4.

Student policies

In all countries with comparable data at least 75 per cent of students are enrolled in schools with some autonomy over student policies, and in 24 countries over 90 per cent are (Figure 5.4). In many countries principals report that responsibilities within their schools for student policies to a large extent lie with either the school board or the principal. Whether it is the school board or the principal that is most influential varies among countries. However, a substantial percentage of the students attend schools in which the decisions on student policies are taken by teachers or department heads. In Greece, Korea and Portugal, and in the partner countries Indonesia, Latvia, FYR Macedonia and the Russian Federation, this amounts to 25 per cent or more of the 15-year-olds (Figure 5.4).

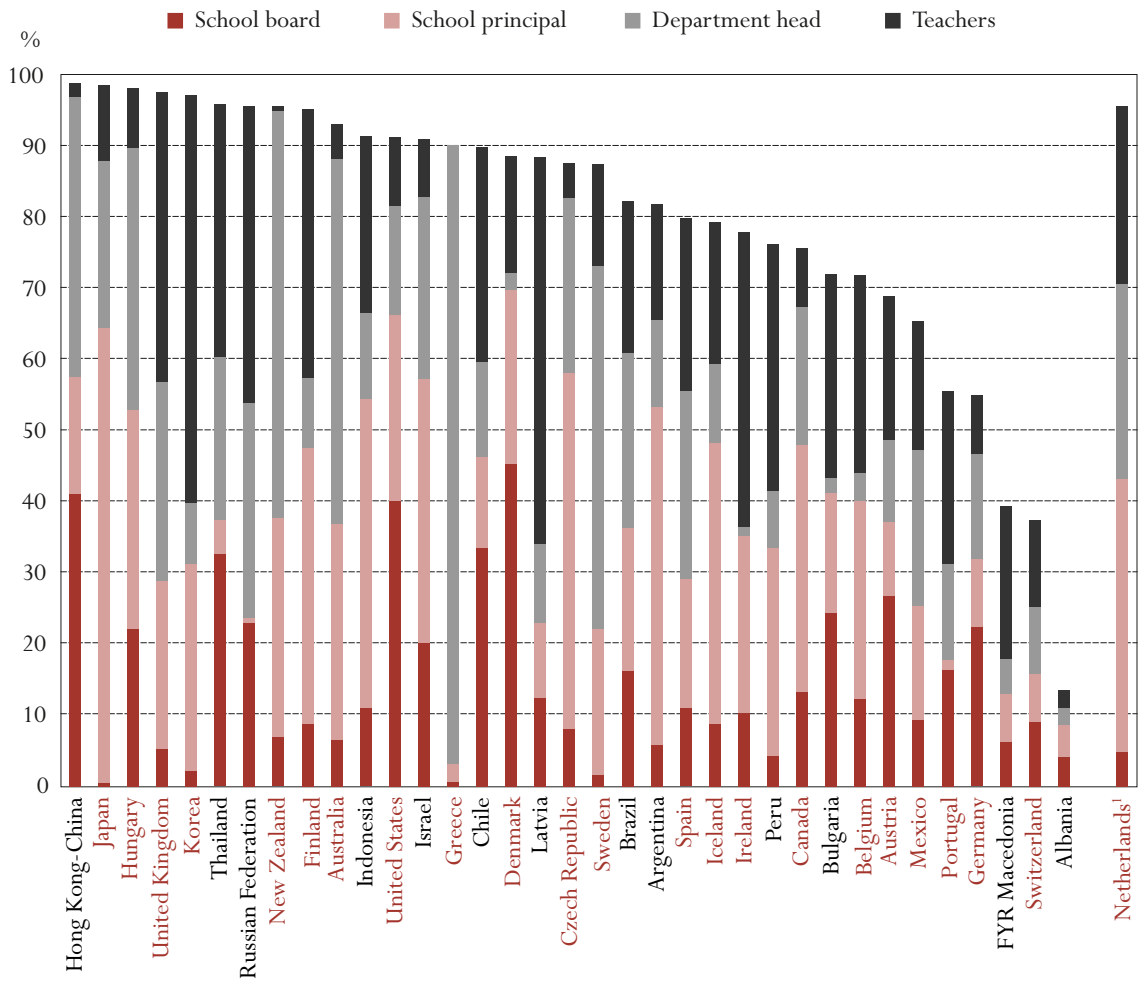
Curriculum and instruction

Principals in all but three countries with comparable data report that over 50 per cent of the 15-year-olds attend schools that have some autonomy in the domain of curriculum and instruction, and in 15 countries 90 per cent or more do (Figure 5.5). In many countries, these school-level responsibilities are decentralised to department heads or teachers. More specifically, in Australia, Greece, Korea, New Zealand, Spain, Sweden and the United Kingdom, and in the partner countries Latvia, the Russian Federation and Thailand, more than half of the students are enrolled in schools in which department heads or teachers are responsible for curriculum and instruction in school. After department heads and teachers, school principals have the most responsibility in this domain. The school board only plays an important role in Austria, Denmark and the United States, and in the partner countries Chile, Hong Kong-China and Thailand (Figure 5.5).

Figure 5.5

Responsibility for curriculum and instruction at the school level

Distribution of mean percentages of students enrolled in schools where principals report that the school board, principal, department head or teachers have some responsibility for curriculum and instruction



1. Response rate is too low to ensure comparability.
Source: OECD PISA database. Table 5.5.

In summary, school principals report that responsibilities in the four domains are largely decentralised to schools, although responsibilities in the personnel management domain are still largely beyond the control of schools in a number of countries. For all domains except curriculum and instruction, school principals report that teachers and department heads have limited responsibility within schools, and most responsibility lies either with the school board or the school principal.

Is there a relationship between school autonomy and student performance?

In *Knowledge and Skills for Life: First Results from PISA 2000* (OECD, 2001), it is noted that within a given country the relationship between aspects of school autonomy and student performance is likely to be rather weak. After all, the discretion of schools to decide on teachers' starting salaries, or which textbooks will be used, among other aspects, is largely dependent on other factors. For example, teachers' salaries may well be organised through collective bargaining agreements with teacher unions, and there may exist national legislation on which text books should be used. Across countries, however, substantial differences in school autonomy become apparent. In those countries in which school principals report, on average, a higher degree of school autonomy with regard to the choice of courses, the average performance on the combined reading literary scale tends to be higher (OECD, 2001).

As far as teacher participation in decision making is concerned, *Knowledge and Skills for Life: First Results from PISA 2000* (OECD, 2001) states that countries with a strong involvement of teachers in school management perform better, on average, on the combined reading literacy scale. More specifically, significant positive correlations are reported between teachers' involvement in deciding which courses are to be offered and average performance on the combined reading literacy scale. In addition, teachers' involvement in determining the course content was positively related to students' reading literacy. Based upon these findings, *Knowledge and Skills for Life: First Results from PISA 2000* (OECD, 2001) concludes that school autonomy and teacher participation in decision making tend to be positively associated with reading performance.

The present report examines the effect of school autonomy, taking into account additional student characteristics, the school context and the policy-amenable school characteristics. The following section determines the direct effect of the level of school autonomy on student performance, then tests the magnitude of the effect in different domains of decision making and finally explores the indirect effect of school autonomy on student performance.

Effect of school autonomy on student performance

The school autonomy index was derived from the number of categories that school principals classified as being a school responsibility (see Annex A for a detailed description of the index). When examining the effect of schools autonomy across the OECD countries without taking student and school characteristics into account, school autonomy has a statistically significant positive relationship with reading literacy (see Table 5.6; Model 1). In other words, on average, student performance in reading is higher in schools with more responsibility. More specifically, if a school's autonomy in one of the OECD countries is one standard deviation above the international average, its mean performance in reading literacy is nearly 7 score points higher than the performance of the average OECD school. Taking into account all countries, this effect is even larger. If a school's autonomy in one of the PISA countries is one standard deviation above the international average, its average performance is nearly 9 score points higher than the average PISA school. This finding suggests that decentralised education systems are more advantageous for students than centralised systems.

Teacher autonomy was derived from the number of categories that the principals classified as being mainly the responsibility of teachers. Without taking into account student characteristics and school-level factors, teacher autonomy has no significant relationship with reading literacy. More internal decentralisation of decision making, in other words, is not related to either lower or higher student performance, both for the OECD countries and for all PISA countries.

However, a slightly different picture emerges if these findings are controlled for relevant student and school-level factors (see Table 5.6; Model 2): across the OECD countries, school autonomy has a statistically significant negative relationship with student performance in reading literacy, although this is weak. On average across the OECD countries, student performance in reading literacy is 2 score points lower in schools with more responsibilities, if student characteristics, school context and other policy-amenable school characteristics are taken into account. As far as the level of teacher autonomy at the school level is concerned, there is no significant relationship with student performance, even when adjusting for the relevant student characteristics, school context and policy-amenable school characteristics.

Effects of decentralisation in different domains of decision making on student performance

Table 5.7 shows the effect of decentralisation on student performance separately for each decision-making domain. The findings reveal different effects according to the decision-making domain without taking into account student characteristics, school context and policy-amenable school characteristics: decentralisation, with regard to personnel management, has a statistically significant positive relationship with student performance in reading literacy; for the financial resources and curriculum and instruction domains there is no statistically significant relationship; and for student policies there is a statistically significant negative effect for all PISA countries (Table 5.7; Model 1).

The positive impact of decentralisation in the domain of personnel management means that students in schools with more autonomy in the domain of personnel management performed better in reading literacy. Students in schools with one standard deviation above the OECD average on autonomy in the domain of personnel management score on average 11 points higher in reading literacy. This positive effect is slightly weaker in PISA countries overall (10 score points higher).

Decentralisation in the domain of student policies, on the other hand, has a negative impact on mean student performance in reading literacy when analysing the impact on all PISA countries (4 score points lower). However, there is no statistically significant effect for all OECD countries and the impact on student performance is also much smaller than that of autonomy in personnel management.

Again controlling for relevant student characteristics, school context and policy-amenable school characteristics shows a different picture (see Table 5.7; Model 2). Decentralisation in the domain of personnel management, then, has a statistically significant negative relationship with reading literacy, but only for the OECD countries. On average, student performance in reading literacy is 2 score points lower if responsibilities for personnel management are decentralised and if student characteristics, school context and other school factors are taken into account. Furthermore, the relationship between decentralisation in the domain of student policies and student performance is no longer statistically significant.

Indirect effect of school autonomy on student performance

In order to test some of the pathways between school autonomy and student performance, such as higher management efficiency and teacher morale, the relationship between different domains of decentralisation

and selected school factors was examined (Table 5.8). In each domain, decentralisation is only weakly associated with most school factors. Still, decentralisation on financial resources is related to a higher quality of educational resources (correlation of 0.16). In other words, learning in schools with more autonomy over their financial resources is less hindered by a lack of computers for instruction, or by a lack of instructional materials in the library, among other things.

Furthermore, decentralisation in the domain of curriculum and instruction is weakly associated with a higher percentage of fully-certified teachers (correlation of 0.10), and a higher percentage of teachers with an ISCED 5A qualification in the language of assessment (correlation of 0.13). This could suggest that decisions on the planning of courses, and the determination of their content, are delegated more easily to teachers and department heads with more qualifications (Table 5.8).

There is a weak positive correlation (0.11) between teacher morale and commitment and school autonomy in personnel management. Perhaps when responsibilities for personnel management lie closer to teachers' daily work environment there are benefits in combating teacher burnout and teachers' absence due to illness.

In all cases, however, the association found is rather weak, with the correlation ranging from 0.10 to 0.16. This does not support the hypothesis that decentralisation of decision making in the four domains has an indirect effect on performance, that is mediated through these school characteristics. The school factor that correlates highest with the four domains of decision making is school type, ranging from -0.20 to -0.11 (Table 5.8). This indicates, not surprisingly, that private schools have more autonomy in the domains of personnel management, financial resources, curriculum and instruction, and student policies. These findings do not imply, however, that private schools internally have responsibilities that are more decentralised than those of public schools.

The PISA 2000 results only partly support the widespread positive expectations that exist with respect to school autonomy and the internal decentralisation of decision making. The expected results are only found when the models are unadjusted for student background and school-level characteristics. However, when interpreting the results it is important to bear in mind the possibility of over-correction for student background characteristics and school-level characteristics.

Public and private schooling

Introduction

The benefits of private schools have been the subject of debate in many industrialised and developing countries over the past two decades. In industrialised countries, private schools are expected to provide better quality education than public schools. However, as private schools are funded to a large extent by fees from parents and students, students in these schools generally come from more advantaged families. At the same time, private schools are usually entitled to select students for admittance. Both facts raise the question as to the degree to which private schools have an advantage in fostering high student achievement that is independent of differences in student intake. In this respect, there are studies that indicate that differences in outcomes between public and private education become much smaller (or even disappear) if student intake characteristics are included in the analyses (McEwan, 2000; Somers *et al.*, 2004). These findings lead to the conclusion that the presumed advantages of private schooling, in terms of student outcomes, are far from clear. Moreover, critics argue that privatisation leads to increased levels of segregation between students with different socio-economic backgrounds.

Public and private schools in PISA

This section shows results as reported by school principals in PISA 2000 for all countries except Australia, Belgium, Canada, France and the partner country Liechtenstein. PISA 2000 classifies schools as either public or private according to whether a public agency or private entity possesses the ultimate power to make decisions concerning the school's affairs. Private schools are schools that school principals report to be controlled and managed by a non-governmental organisation, and/or to have governing boards consisting mostly of members not selected by a public agency. Examples of non-governmental organisations are churches, trade unions and business enterprises.

Private schools are further categorised as either independent private schools or government-dependent private schools according to the source of their funds. Independent private schools receive at least 50 per cent of their funds from private sources, for example from fees paid by parents, donations, sponsorships or parental fund-raising. Government-dependent private schools, however, receive 50 per cent or more of their core funding from government agencies. In other words, government-dependent private schools are predominantly financed through the public purse.

Public schools are reported by their principals to be controlled and managed directly by a public education authority, a governmental body or by a governing body, most of whose members were either appointed by a public authority or elected by public franchise.

Distribution of PISA 2000 students by type of school

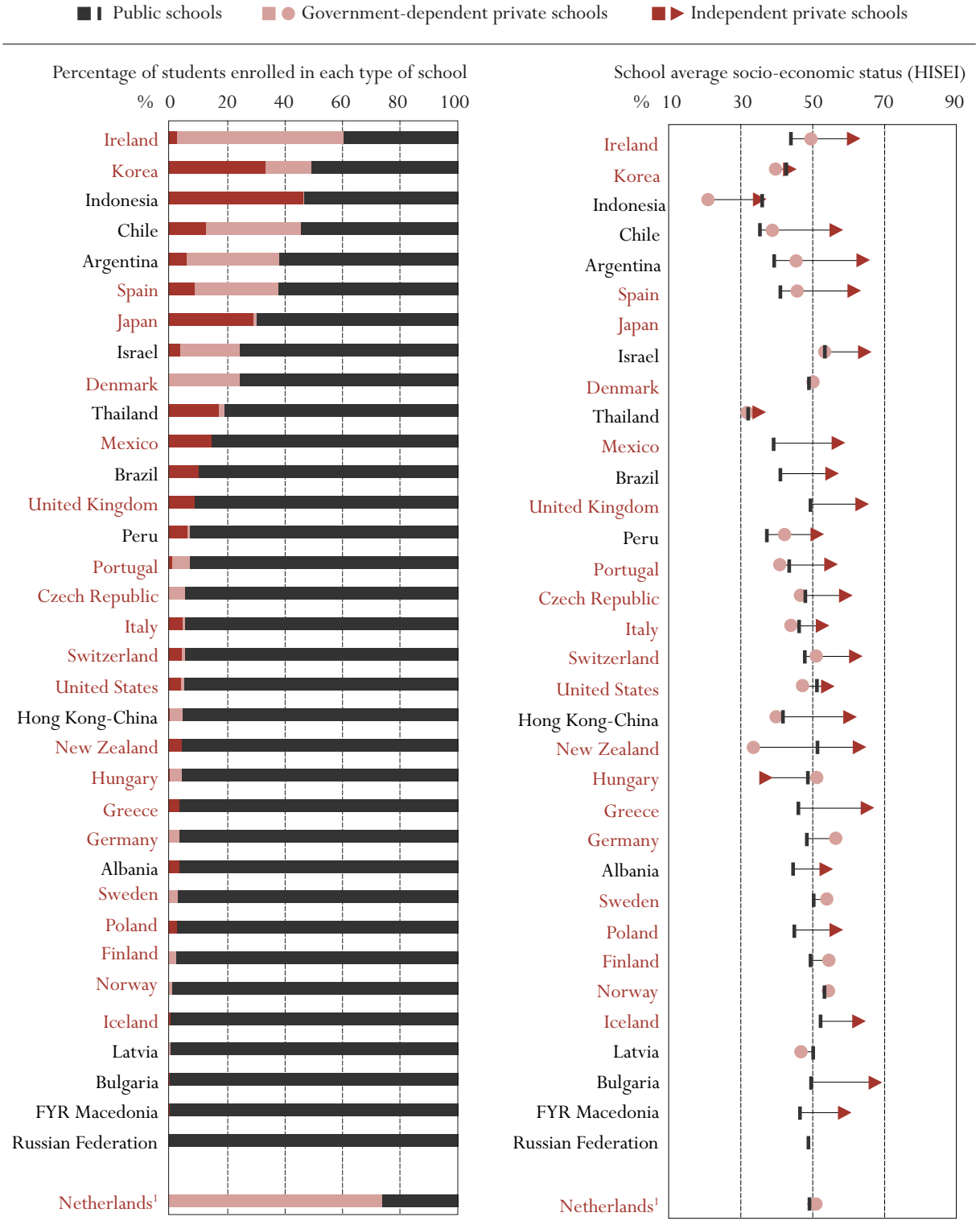
Figure 5.6 shows the distribution of students enrolled either in independent private schools, government-dependent private schools or public schools. On average in the OECD countries, around 6 per cent of all participating students are enrolled in schools whose principals report the school as being both privately managed and funded (independent private schools). In some countries, however, independent private schools play a more substantial role on the educational scene: in Japan and Korea 30 per cent or more students were enrolled in independent private schools and in the partner country Indonesia this was over 40 per cent, and in Mexico and the partner countries Brazil, Chile and Thailand over 10 per cent. In the OECD countries, students attending a private school are more likely to be enrolled in a government-dependent private school (11 per cent of 15-year-old students on average). In Ireland and the Netherlands, the majority of students attend government-dependent private schools (58 and 74 per cent of students, respectively).

School average socio-economic status and type of school

There is an uneven distribution of students from different socio-economic backgrounds across school types: independent private schools draw their students from higher social strata than both government-dependent private schools and public schools (Figure 5.6). Only one country clearly deviates from this pattern: Hungary, where students in public schools and government-dependent private schools come from higher socio-economic backgrounds than students in independent private schools. For the majority of countries there are not large differences in average socio-economic status between government-dependent private schools and public schools and these differences are usually in favour of government-dependent private schools. However, in both New Zealand and the partner country Indonesia public schools on average have a significantly higher socio-economic intake than government-dependent private schools (Figure 5.6).

Figure 5.6

PISA 2000 students enrolled in public and private schools



Note: Countries are ranked in desending order of percentage of students enrolled in public schools.
1. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 5.9 and 5.10.

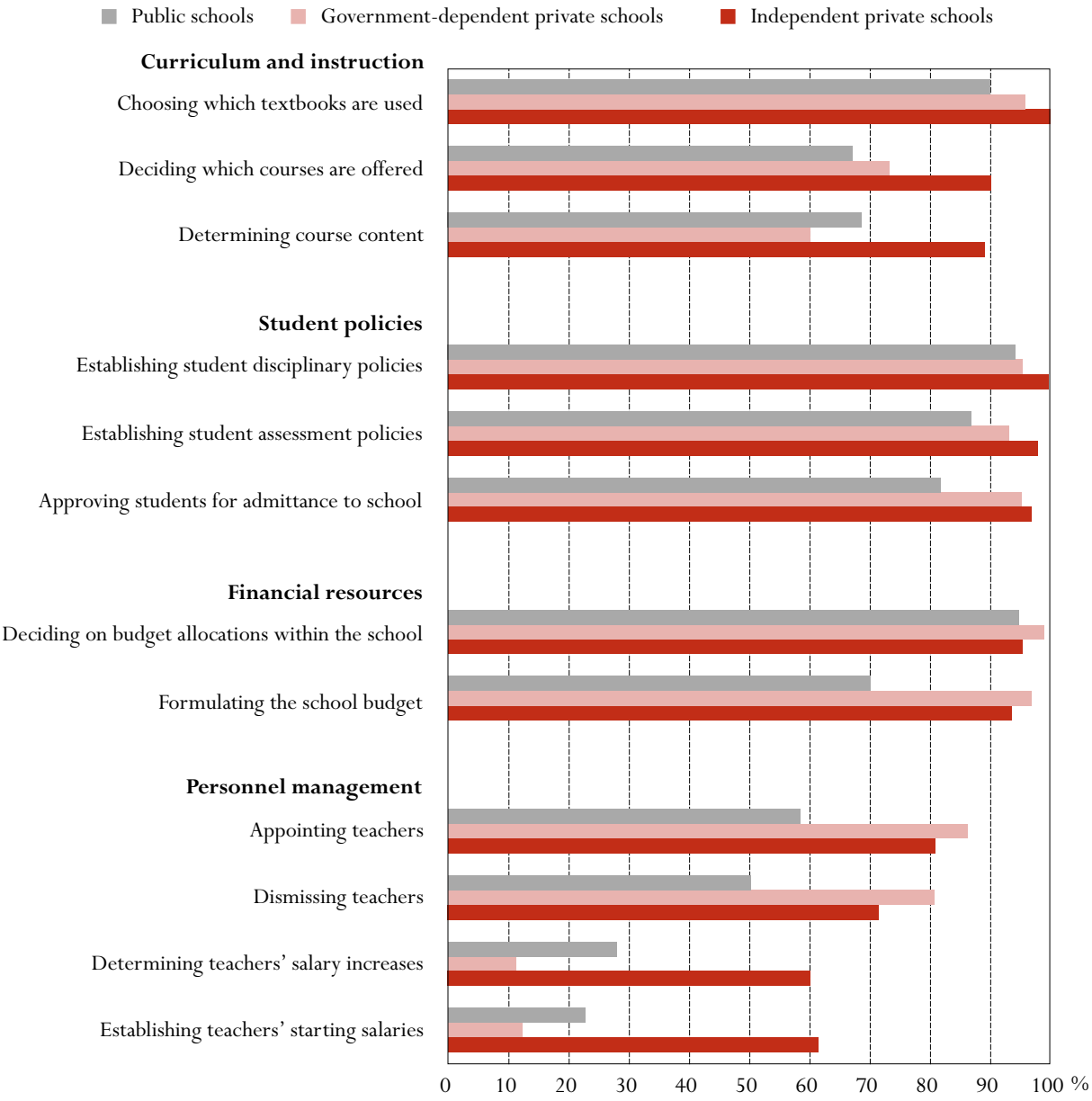
Degrees of decentralisation in public and private schools

Previous studies on the organisation and functioning of public and private schools have indicated that, in some countries, differences exist between these two school types with regard to the level of teacher participation in decision making, and in the degree to which other actors are involved in decisions that are taken in school (Hannaway, 1991). Although the findings of these studies are inconclusive in some

Figure 5.7

Responsibility at the school level in OECD countries for curriculum and instruction, student policies, financial resources and personnel management in public and private schools

Distribution of mean percentages of students enrolled in schools where principals report that schools take on the following aspects of policy and management



Source: OECD PISA database. Table 5.11.

respects, they generally reveal that public schools are less autonomous than private schools. Figure 5.7 shows for the OECD countries on average the percentage of 15-year-olds enrolled in independent private schools, government-dependent private schools and public schools with a degree of autonomy in each of the domains of decision making. The results indicate a greater level of autonomy in private schools than in public schools on every aspect of decision making, but in particular with regard to responsibilities for personnel management. On average in the OECD countries government-dependent private schools typically enjoy a higher degree of autonomy than public schools, but a lower degree of autonomy than independent private schools regarding deciding on which courses are offered, the choice of textbooks, student admittance, student assessment policies and student disciplinary policies. However, government-dependent private schools enjoy more autonomy than both public schools and independent private schools with respect to budget allocation, formulating the school budget, dismissing teachers and appointing teachers.

Differences in school characteristics between the three school types

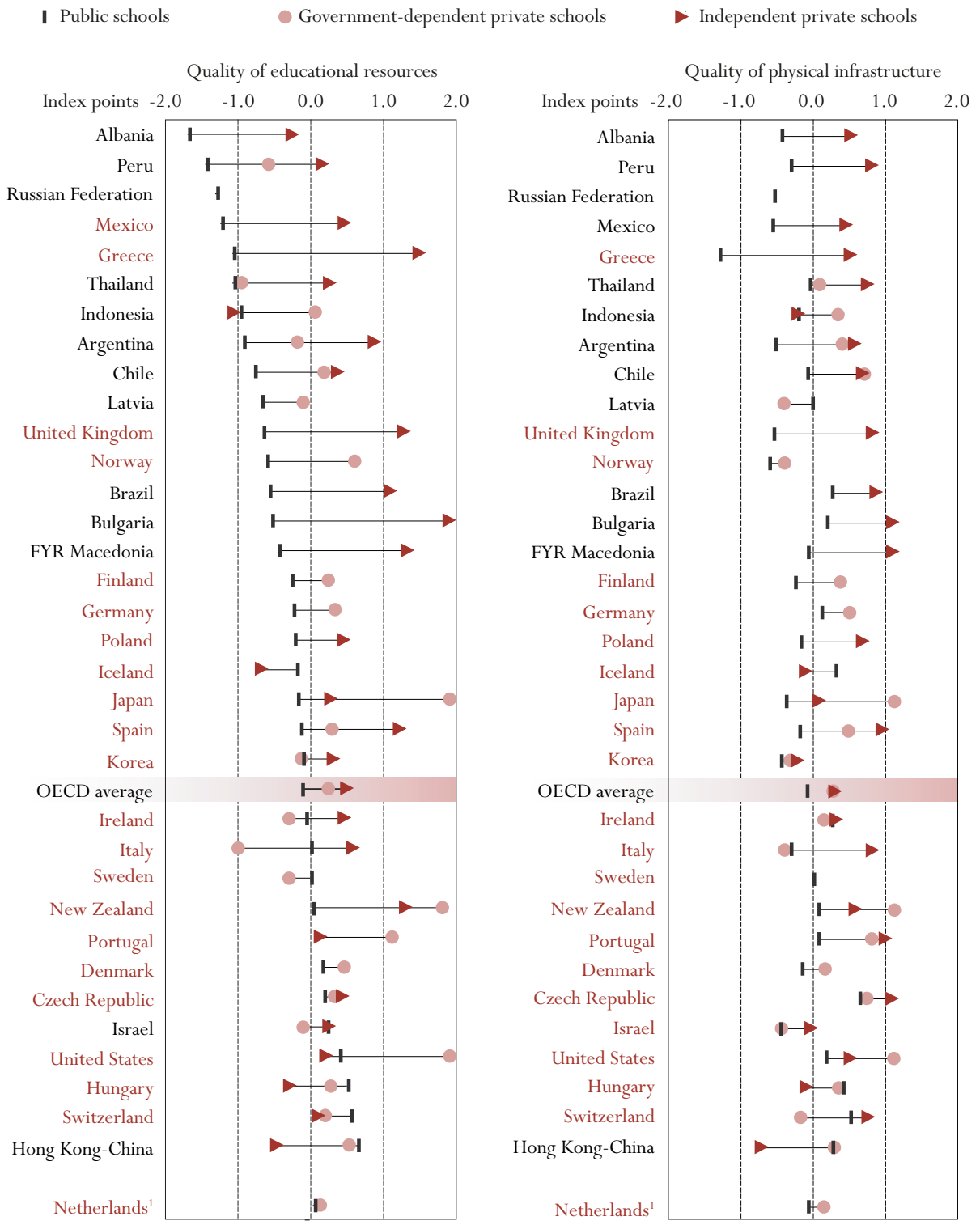
Apart from differences in autonomy and school internal decentralisation, other school characteristics differ between public and private schools. School principals were asked to provide their views on the quality of educational resources and physical infrastructure in their schools, on how they perceive their schools' climate in terms of both teacher- and student-related factors, and also the level of morale and commitment teachers have within their schools. Standardised indices were developed from principals' responses that allow a comparison of perceptions in public schools, independent private schools and government-dependent private schools. Annex A presents the details of how each index was derived.

PISA 2000 asked school principals in public and private schools to report on the quality of educational resources in their schools. Specifically, PISA 2000 asked to what extent learning by 15-year-olds in their schools was hindered by not enough computers for instruction; lack of instructional materials in the library; lack of multi-media resources for instruction; inadequate science laboratory equipment; and inadequate facilities for the fine arts. Principals in public schools report a comparatively lower quality of educational resources than their counterparts in private schools report in almost all of the participating countries (see Figure 5.8). Only in Hungary, Iceland, Sweden, Switzerland and the partner countries Hong Kong-China and Israel, are public schools reported to have on average better educational resources than private schools. In particular, the principals of public schools in the partner countries report comparatively lower quality educational resources than the principals of private schools in the partner countries report (at least one index point lower). The principals of public schools in Greece, Italy, Japan, New Zealand, Norway, Spain, the United Kingdom and the United States also perceive a relatively low quality of educational resources in their schools.

PISA 2000 also asked principals to report on the physical infrastructure in their schools, specifically on the extent to which learning by 15-year-olds in their school was hindered by: poor condition of buildings; poor heating and cooling and/or lighting systems; and lack of instructional space (*e.g.* in classrooms). A similar pattern is found regarding the perceived quality of the physical infrastructure (Figure 5.8). In all but three participating countries (Hungary, Iceland and the partner country Hong Kong-China), the perceived quality of the physical infrastructure is lower in public schools than in independent private schools. Again in the majority of countries, principals in both independent private schools and government-dependent private schools report better quality physical infrastructure in comparison to their counterparts in public schools. Nevertheless, there is much difference within countries in the reported quality of physical infrastructure in independent private schools and government-dependent private schools.

Figure 5.8

School resources in public and private schools



Note: Countries are ranked in ascending order of quality of educational resources in public schools.
1. Response rate too low to ensure comparability.
Source: OECD PISA database. Table 5.15a.

Chapter 3 demonstrates that of the policy-amenable school characteristics school climate has the most impact on student performance. PISA 2000 asked principals in public and private schools to give their views on their schools' climate. The questions asked allow a separation between teacher- and student-related factors that affect the school climate. Teacher-related factors that may hinder learning by 15-year-olds in school include low expectations of teachers; poor student-teacher relations; teachers not meeting individual students' needs; teacher absenteeism; staff resisting change; teachers being too strict with students; and students not being encouraged to achieve their full potential. Student-related factors that may hinder learning by 15-year-olds in school include student absenteeism; disruption of classes by students; students skipping classes; students lacking respect for teachers; the use of alcohol or illegal drugs; and students intimidating or bullying other students.

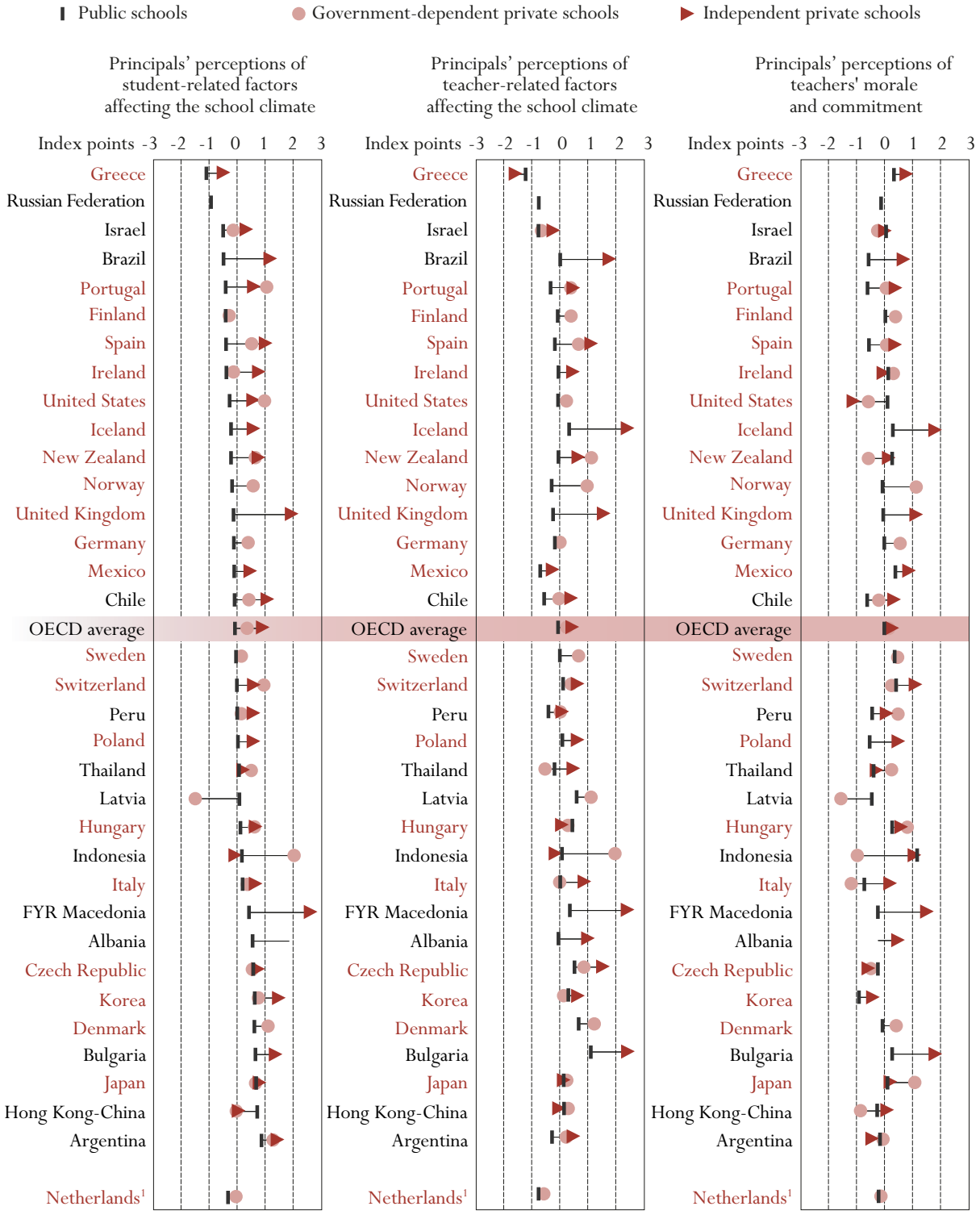
Principals in public schools report to have a less favourable school climate than their counterparts in independent private schools in most countries. With regards to teacher-related factors affecting the school climate, only in Greece, Hungary and the partner countries Hong Kong-China and Indonesia do principals in public schools report a more favourable climate than the principals in independent private schools (Figure 5.9). Similarly, in all but three countries (Hungary, Korea and the partner country Thailand), principals in government-dependent private schools also report a more favourable school climate with respect to teacher-related factors than their counterparts in public schools, although within countries the perceived climate of independent private schools and government-dependent private schools may differ considerably (Figure 5.9).

A similar pattern is found regarding student-related factors affecting the school climate. In the majority of participating countries principals in independent private schools and government-dependent private schools report to have a more favourable climate with respect to student-related factors than their counterparts in public schools (Figure 5.9). In Ireland, Spain, the United Kingdom and the partner countries Albania, Brazil, Chile and the FYR Macedonia principals in independent private schools report that student behaviours and attitudes form a much more favourable climate than their counterparts in public schools report (at least one index point higher). Again, across countries big differences are found in the school climate regarding student factors in independent private schools and government-dependent private schools: in general principals in independent private schools report a more favourable climate, but principals in government-dependent private schools in Portugal, Switzerland, the United States and the partner countries Indonesia and Thailand report a more favourable climate.

Another important aspect of the school climate is teachers' morale and commitment. Principals were asked to provide their views on teachers in their schools by specifying to what extent they agreed with the following statements: the morale of the teachers in this school is high; teachers work with enthusiasm; teachers take pride in this school; and teachers value academic achievement. Again, in the majority of countries principals in public schools report comparatively lower levels of teachers' morale and commitment, however in many countries there is not much difference in principals' perceptions between the different types of schools (Figure 5.9). Only in a few countries do principals in independent private schools report teachers' morale and commitment to be an index point higher than principals in public schools (Iceland, the United Kingdom, and the partner countries Brazil, Bulgaria and the FYR Macedonia). In the Czech Republic, New Zealand, the United States and the partner country Indonesia, principals in private schools report comparatively lower levels of teachers' morale and commitment (Figure 5.9).

Figure 5.9

School climate in public and private schools



Note: Countries are ranked in ascending order of principals' perceptions of student-related factors affecting the school climate in public schools.
1. Response rate too low to ensure comparability.
Source: OECD PISA database. Tables 5.15b and 5.15c.

Public and private schooling and student performance

Are there differences in student performance between public and private schools? If so, how significant are these differences and are they similar across countries? On average in the OECD countries there are very clear observed differences in student performance: students in independent private schools and government-dependent private schools outperform students in public schools by 43 score points and 28 score points, respectively (see Model 1 in Table 5.13). However, the results are quite different once adjusting for student characteristics, school context and policy-amenable school characteristics: there is not a statistically significant difference in performance between students in government-dependent private schools and students in public schools on average in the OECD countries (see Model 2 in Table 5.13). Similarly, if student characteristics, school context and policy-amenable school characteristics are accounted for students attending public schools outperform students attending independent private schools in reading literacy by about 14 score points in the OECD countries on average. Average performance differences for all PISA countries show a similar trend (Table 5.13).

It is important to consider that private education may have different meaning in different education systems. Figure 5.10 (selected countries from Table 5.14) shows 17 countries that have significant differences in student performance between independent private schools and public schools.[1] As can be seen from the many light bars on the right side of the figure, independent private schools significantly outperform public schools in 14 of the 17 countries for which significant performance differences can be observed. In Iceland, Ireland, Italy, Mexico, New Zealand, Spain and the United Kingdom, as well as in the partner countries Argentina, Bulgaria, Chile, Israel and Peru, the large significant performance advantage observed for independent private schools becomes insignificant, once student characteristics, school context, school resources, school climate and school policies have been taken into account. In the Czech Republic, students in public schools actually perform significantly better than students in independent private schools, once controlling for these factors.[2] Thus, for the 13 countries mentioned above, the expectation that independent private schools do not perform better than public schools when adjusting for student and school characteristics is confirmed. In other words, the relative advantage in many countries of independent private schools in student performance may be attributed to the fact that they have better student intake, school resources and a more favourable school climate.

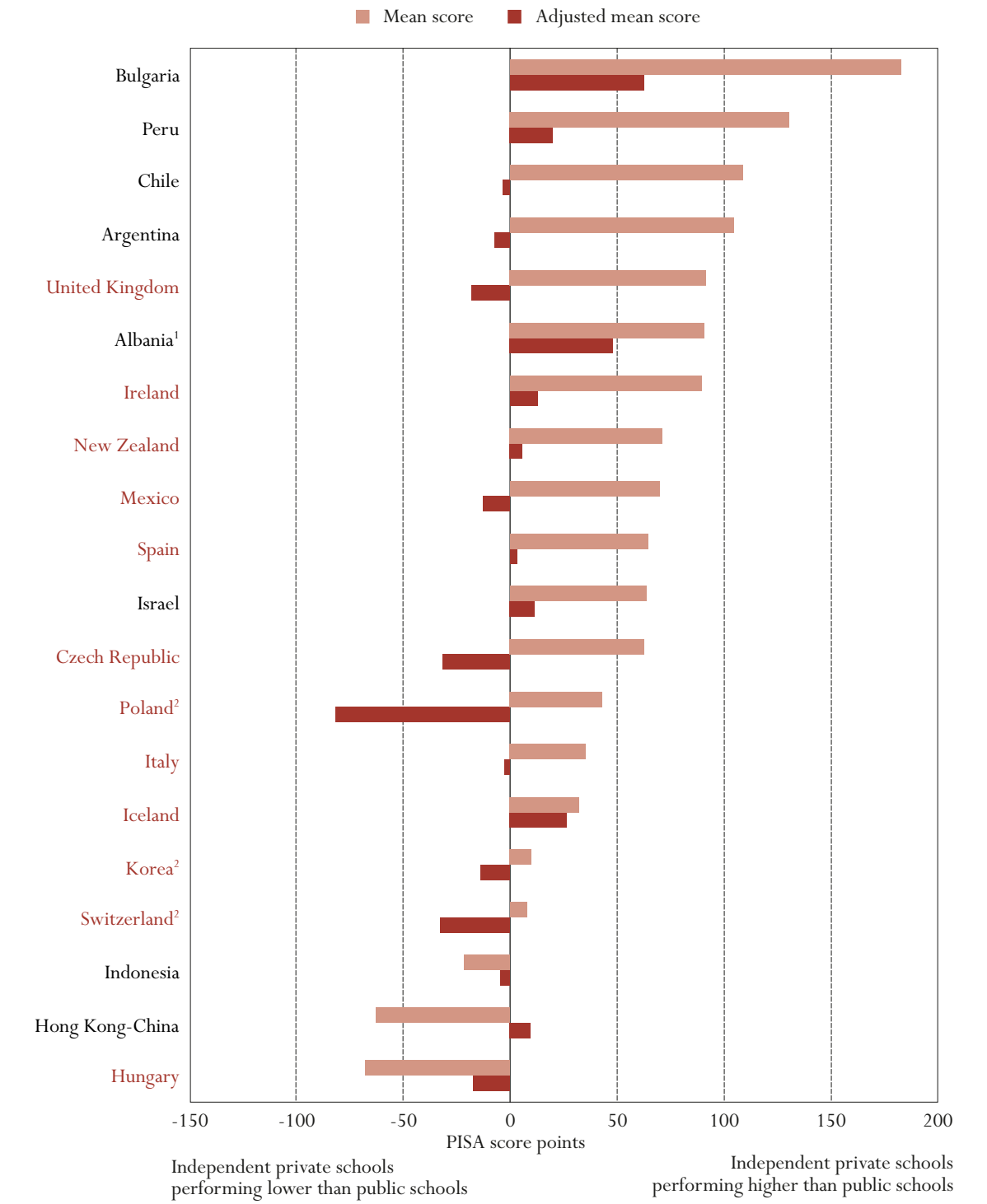
However, it is important to highlight that there are three countries (Hungary and the partner countries Hong Kong-China and Indonesia) in which students in independent private schools perform significantly lower than students in public schools. Interestingly, once controlling for student background and school characteristics, the performance difference is reduced in Hungary and the partner country Indonesia, and in the partner country Hong Kong-China independent private schools outperform public schools (although the difference is not significant). In other words, in these countries independent private schools may be disadvantaged in their resources and may have a large percentage of students from less advantaged backgrounds.

Figure 5.11 (selected countries from Table 5.14) shows 11 countries, in which there are significant performance differences between government-dependent private schools and public schools[3]. As can be seen from the many light bars on the right side of the figure, in the majority of the countries (Germany, Ireland, Spain and the United States, and the partner countries Argentina, Chile and Peru), government-dependent private schools also outperform public schools. Furthermore, in all seven countries, the performance difference becomes insignificant, once controlling for student and school characteristics. This suggests that higher performance of government-dependent private schools may

Figure 5.10

Difference in student performance between independent private and public schools

Comparing differences in the unadjusted model and the adjusted model (controlling for student and school characteristics)



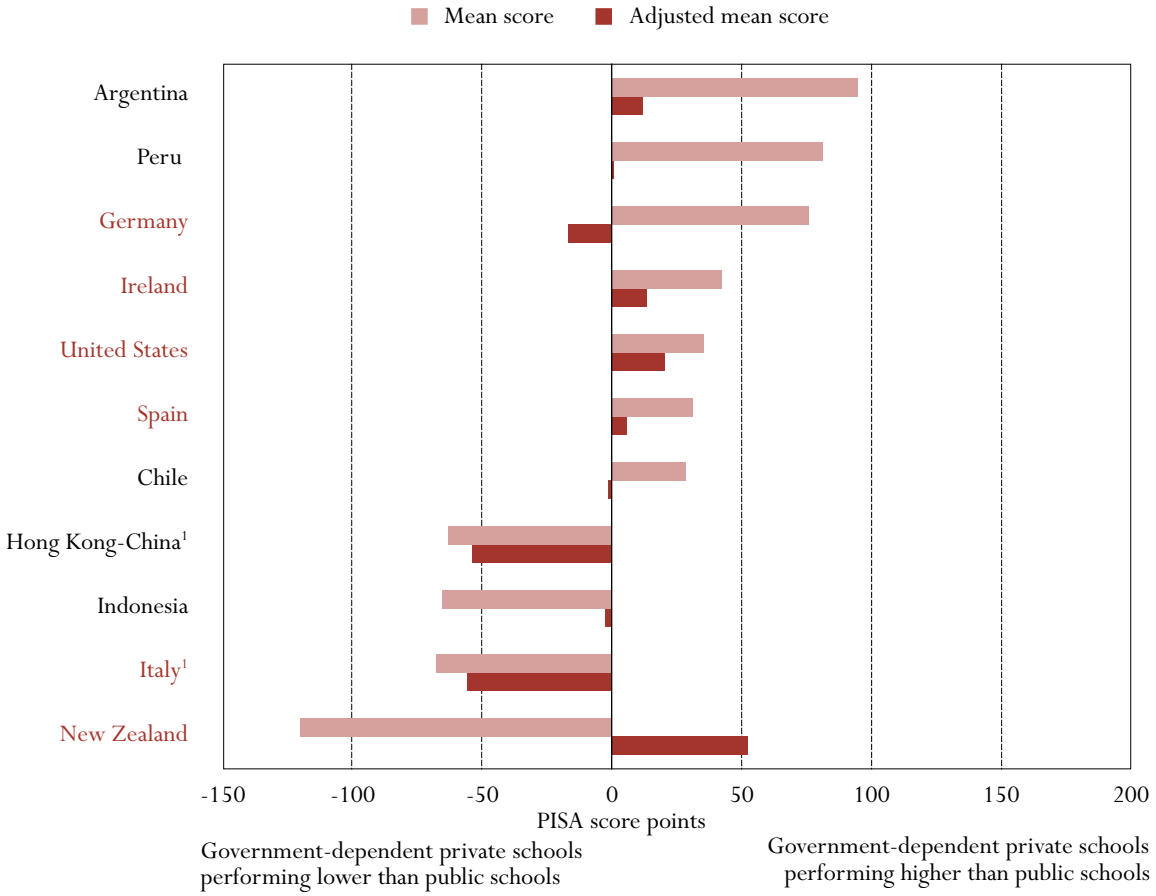
1. Significant difference between public and independent private schools in the adjusted model ($p<0.01$) only.
2. Difference is only statistically significant when adjusted for student characteristics and school context.

Source: OECD PISA database. Table 5.14.

Figure 5.11

Difference in student performance between government-dependent private and public schools

Comparing differences in the unadjusted model and the adjusted model (controlling for student and school characteristics)



1. Significant difference between private government-dependent schools and public schools in the adjusted model ($p<0.01$) only.
Source: OECD PISA database. Table 5.14.

also be attributable to their higher levels of socio-economic status in student intake, their school resources and their school climate.

However, in four countries (Italy, New Zealand and the partner countries Hong Kong-China and Indonesia), public schools significantly outperform government-dependent private schools (Figure 5.11). The comparison of public schools and government-dependent private schools in New Zealand shows a unique case, in which public schools lose their performance advantage over government-dependent private schools, once taking into account student and school characteristics. In Indonesia, the significant positive difference is reduced and becomes insignificant. Even after considering student characteristics and school characteristics, public schools significantly outperform government-dependent private schools in Italy and the partner country Hong Kong-China, which suggest that the disadvantage of government-dependent private schools is due to other reasons.

Countries that are not included in Figures 5.10 and 5.11 show no significant difference in student performance between public schools and independent private schools or between public schools and government-dependent private schools[3]. The effects of public and private schools on reading literacy described above, therefore, certainly can not be generalised among countries. Nevertheless, there appears to be a pattern in many countries with regard to public and private schools: students in independent private as well as in government-dependent private schools perform better in reading literacy than students in public schools; differences in achievement between school types disappear if adjustments are made for student intake and for the facilities and the qualifications and morale of the teachers at these schools. At the same time, Figures 5.10 and 5.11 also reveal that in some countries the difference between public and private schools is in the opposite direction, which indicates that private education in some education systems has a different status and meaning than it has in other education systems.

Conclusions

Principals report that schools play a prominent role in decision making in all countries, although decision-making powers in the personnel management domain remain largely beyond the control of schools in a number of countries. Where decisions are decentralised to schools, either the school board or the school principal takes them, with department heads and teachers playing a major role only in the domain of curriculum and instruction.

On average across the OECD countries, students in schools with more autonomy perform better. A closer look at autonomy in each domain of decision making reveals that students enrolled in schools with responsibility for personnel management outperform students in other schools by 11 score points. Autonomy in the other domains of decision making does not have such an impact on student performance. However, the advantage that schools with more autonomy in personnel management enjoy appears to be linked to their favourable school composition, as adjustment for student and school characteristics shows.

Levels of autonomy also differ according to the type of school. Independent private schools enjoy more autonomy than public schools in all domains. According to the decision-making domain, government-dependent private schools fall between these schools. With regard to approving students for admittance to school, formulating the school budget and deciding on budget allocations, as well as the appointment and dismissal of teachers, government-dependent private schools are very much like independent private schools. Concerning decisions on teachers' starting salaries and salary increases, the determination of the course content and student disciplinary policies, government-dependent private schools show great resemblance to public schools.

In most countries principals report that teaching and learning in public schools takes place under less advantageous conditions than in private schools. These differences in school conditions imply differential educational opportunities for students attending different school types. Compared to other school types, principals in public schools report that their schools have lower quality educational resources and physical infrastructure, less favourable school climate and that the teachers have slightly lower levels of morale and commitment than their counterparts in private schools.

However, despite these reported disadvantages, in half of the participating countries there are not statistically significant performance differences between students in public or independent private schools. For the remaining countries students in independent private schools outperform students from public

schools. The school composition again plays the most significant role in these performance advantages: independent private schools lose their performance advantage in all countries once student and school characteristics are taken into account. This is confirmed by the few countries in which public schools significantly outperform independent private schools – controlling for student and school characteristics shows that this is largely attributable to a more favourable intake.

Notes

1. Korea, Poland and Switzerland were included in Figure 5.10, although the observed performance differences are not statistically significant, once adjustment is made for student and school characteristics independent private schools perform statistically significantly lower than public schools.
2. Once adjustment is made for student and school characteristics public schools significantly outperform independent private schools in Korea, Poland and Switzerland.
3. Japan is excluded as data for the adjusted model are unavailable.

Chapter

6

A SUMMARY OF MAIN RESULTS AND THE IMPLICATIONS FOR EDUCATIONAL POLICY

Summary of main findings

School performance differs, but far more so in some countries than in others

PISA 2000 results show that the schools students attend are closely related to their performance. On average across OECD countries, roughly 35 per cent of the overall variation in reading literacy performance lies between schools (Table 2.1). However, the extent to which school performance varies differs greatly across countries, ranging from 8 per cent of the overall performance variation in Finland and Iceland to 66 per cent in Hungary (Table 2.2). The lowest variation in student performance among schools is found in the Nordic countries. The countries with highly stratified school systems show the largest between-school variances.

The socio-economic composition of schools is strongly related to student performance

From a policy perspective it is important to consider the effect of those conditions in schooling that can be influenced by policy, ranging from structural differentiation in the system of schools to teaching strategies. In order to study these effects in studies such as PISA, they must be disentangled from contextual factors that are more difficult to influence. This report analysed how much of the between-school variation in student performance in reading literacy is explained by student characteristics, school averages on student characteristics and the various policy-amenable school characteristics that were measured in the PISA 2000 survey, including school climate, school policies and school resources. Contextual factors, in particular a school's socio-economic composition, account for significantly more variation in student performance among schools than do factors relating to school climate, school policies and school resources, underlining the importance for education policy makers to devote adequate attention to those features of education systems that relate to the socio-economic composition of schools. In the OECD countries around 50 per cent of the between-school variance in reading literacy is explained by student background, just under 20 per cent by the school context (in particular, school average socio-economic status), and around 5 per cent by the school climate, school policies and school resources that were measured in the PISA 2000 survey. Around 30 per cent of the between-school variance remains unexplained. Results are quite similar for variation in student performance in mathematical literacy and scientific literacy (Table 3.1).

Many school factors interact with the socio-economic composition of schools, raising important questions about equality in educational opportunities

However, the interpretation of these results is complicated by the fact that contextual factors and school characteristics show considerable overlap in their association with student performance. The amount of performance variation among schools that these factors jointly explain outweighs the variation uniquely explained by the school characteristics measured by PISA in most countries. This joint association may suggest that there is a positive interaction between a favourable school composition and favourable school characteristics. This is highly relevant for policies designed to improve equity in educational opportunities. For example, less advantaged students would tend to be in schools in which conditions are sub-optimal. When explaining performance variation among schools, there is a far stronger joint association between the school climate and the contextual factors than there is between either school policies or school resources and the contextual factors. School climate may be strongly influenced by the norms and values that students bring to the school, which in turn may be closely associated with the students' socio-economic background.

Early selection is also closely associated with school difference and social disparities

Catering for an increasingly diverse student body and narrowing the gaps in student performance represent formidable challenges for all countries and the approaches that countries have chosen to address these demands vary. Some countries have non-selective school systems that seek to provide all students with similar opportunities for learning by requiring that each school caters for the full range of student performance. Other countries respond to diversity explicitly by forming groups of students through selection either between schools or between classes within schools, with the aim of serving students according to their academic potential and/or interests in specific programmes. Education systems can be located on a continuum ranging from systems with low stratification at system, school and classroom levels to systems that are highly differentiated.

An important dimension of tracking and streaming is the age at which decisions between different school types are generally made, and therefore students and their parents are faced with choices. Such decisions occur before the age of 14 in eight of the countries participating in PISA 2000, and as early as age 10 in Austria and Germany. By contrast, in 14 of the participating countries no formal differentiation takes place at least between schools until after the age of 15.

Across the OECD countries, mean student performance in reading literacy tends to be lower in countries with a high degree of institutional differentiation and selection at an early age, as compared to countries with integrated secondary school systems where selection has not taken place at the age of 15. Even more importantly, the share of the OECD average variation in student performance that lies between students and schools tends to be much higher in countries with early selection policies. While this, in itself, is not surprising because variation in school performance is an inevitable outcome of stratification, the findings also show that education systems with lower ages of selection tend to show much larger social disparities. The reason why the age at which differentiation begins is closely associated with social selectivity may be explained by the fact that students are more dependent upon their parents and their parental resources when they are younger. In systems with a high degree of educational differentiation, parents from higher socio-economic backgrounds are in a better position to promote their children's chances, whereas in a system in which such decisions are taken at a later age students themselves can play a bigger role.

In sum, PISA 2000 results show that students in integrated education systems perform, on average, better than those in selective education systems, and that their educational performance is less dependent on their background. Many factors may be at play here. A higher average performance suggests that the more heterogeneous student groups or classes in integrated education systems could have a beneficial effect for the lower-performing students. Also, the flexibility offered by an integrated system may allow students to improve their performance while keeping their academic options open.

School autonomy has been realised to a considerable extent with regard to responsibilities for student policies, financial resources, and curriculum and instruction

Increased autonomy over a wide range of institutional operations, with the objective to raise performance levels through devolving responsibility to the frontline and encouraging responsiveness to local needs, has been a main aim of the restructuring and systemic reform since the early 1980s. This has involved enhancing the decision-making responsibility and accountability of principals and, in some cases, the management responsibilities of teachers or department heads. Nonetheless, while school autonomy may stimulate responsiveness to local requirements, it is sometimes seen as creating mechanisms for choice favouring groups in society that are already advantaged.

In order to gauge the extent to which school staff have a say in decisions relating to school policy and management, principals in PISA 2000 were asked to report whether teachers, department heads, the principal or an appointed or elected board had responsibility for appointing teachers, dismissing teachers, establishing teachers' starting salaries, determining teachers' salary increases, formulating school budgets, allocating budgets within the school, establishing student disciplinary policies, establishing student assessment policies, approving students for admittance to school, choosing which textbooks to use, determining course content and deciding which courses were offered.

These reports from school principals show that school autonomy has been realised to a considerable extent in domains like student policies (policies with respect to admittance, discipline and assessment), financial resources (formulating and allocating the school budget), and curriculum and instruction (choosing textbooks, determining course content and deciding which courses are offered). Large percentages of 15-year-old students are in schools that have considerable autonomy in these areas (Table 5.1). More variation between countries exists in the domain of personnel management (Tables 5.2, 5.3, 5.4 and 5.5). This is also the domain in which, on average, school autonomy tends to be most restricted.

Responsibilities within autonomous schools mainly lie with the school board and school principal

PISA 2000 also allows an examination of the distribution of decision-making responsibilities within schools, which might also be seen as the degree of participation in school-level decision making of teachers and department heads. Within schools that have autonomy in the domains of personnel management and financial resources management, in most countries responsibilities lie with the school principal (on average in the OECD countries 22 per cent and 49 per cent of 15-year-olds are enrolled in schools where the school principal has responsibility for these decisions, respectively) and the school board (17 per cent and 34 per cent on average in the OECD countries, respectively), while department heads and teachers have relatively few responsibilities. Department heads and teachers enjoy relatively more responsibilities in the domain of student policies (8 per cent and 7 per cent on average in the OECD countries, respectively) and in the domain of curriculum and instruction (22 per cent and 19 per cent on average in the OECD countries, respectively).

School autonomy is associated with better student performance

Does the distribution of decision-making responsibilities affect student performance? In this field, the association between the different aspects of school autonomy and student performance within a given country is often weak. This is understandable because national legislation frequently specifies the distribution of decision-making responsibilities, so there is often little variation within countries. However, the data suggest that in those countries in which principals report, on average, higher degrees of autonomy in key aspects of school management the average performance of schools in reading literacy tends to be higher. Again, this observed performance advantage seems to be linked to the fact that schools with a more advantaged social intake have higher reported levels of school autonomy (Table 5.6).

Independent private schools have more autonomy and a more advantaged student intake and this is also true for government-dependent private schools in 15 countries

Independent private schools tend to be more autonomous than public schools. Government-dependent private schools fall between independent private and public schools in their autonomy (Table 5.11). With respect to the composition of the school population, independent private schools appear to draw their students from higher social strata than government-dependent private and public schools. This is the case in all countries, except for Hungary. When comparing government-dependent private schools and

public schools a higher school average socio-economic status was found in government-dependent private schools in 15 countries, while the reverse was true for 9 countries. In general, the differences in student intake between government-dependent private schools and public schools are smaller than those between independent private schools and public schools (Table 5.10).

Public schools have a comparatively lower quality of school conditions when measured by school climate and material resources, but not by teacher quality

When comparing the quality of school conditions on a number of PISA measures referring to material resources and favourable climate conditions, independent private schools are far better off than public schools, according to the school principals' reports. Government-dependent schools fall between independent private and public schools on most aspects (Table 5.12). These general results are confirmed in a majority of countries, in particular the disadvantaged position of public schools regarding material resources and school climate conditions. The results concerning teacher quality offered a more mixed picture, and country-specific analyses showed large differences between countries (Tables 5.15a, 5.15b and 5.15c).

Independent private schools and government-dependent private schools outperform public schools in many countries, but this appears to be largely due to an advantaged student intake

In many countries, independent private schools and government-dependent private schools outperform public schools. However, this association disappears (or even becomes negative), once student background variables are taken into account (Table 5.14).

Summary of main indicators of quality and equity in education systems

Figure 6.1 provides an overview of key equity-related indicators for each country. Countries are ranked according to their mean student performance in reading literacy. Countries have been grouped into five categories, depending on their mean performance relative to the OECD average: countries that performed statistically significantly above the OECD average; countries that performed not statistically significantly different from the OECD average; countries that performed statistically significantly below the OECD average by less than 50 score points; countries that performed statistically significantly below the OECD average by 50 to 100 score points; and countries that performed statistically significantly below the OECD average by more than 100 score points. Countries have also been grouped into five categories on each of the eight equity indicators, depending on the decile scores on the respective indicators. The second and third columns in Figure 6.1 indicate the position of countries on the two indicators that reflect the observed student performance variation. The fourth and fifth columns show indicators that reflect the degree of equity/inequity of input provisions, teacher qualifications and the quality of school resources. The remaining columns show indicators on the extent to which the following student background characteristics are associated with student performance: parents' occupational status, immigrant status, gender and the joint effect of student characteristics, school context and school resources.

Performance variation between schools

Nine of the 13 top performing countries show a high degree of consistency in the performance of schools. In contrast, in Austria, Belgium, Germany, Hungary and Poland, and the partner countries Argentina, Bulgaria and Peru, the performance of schools differs significantly. With the exceptions of Austria and Belgium all of these countries show below-average overall performance.

Figure 6.1

Summary of main measures of quality and equity

	QUALITY	EQUITY[1]							
		Realised performance differences		Distribution of inputs		Student background dependency of educational performance			
	Mean student performance in reading literacy	School level: Between-school variance	Overall: Standard deviation in student performance in reading literacy	Teachers with an ISCED 5A qualification in the language of assessment[2]	Quality of school resources[2]	Difference between top and bottom quarter on parents' occupational status	Reading advantage of female students	Reading disadvantage of non-native students	Variance jointly explained by student characteristics, school context and school resources
Finland	546	1	3	4	3	2	10	8	1
Canada	534	3	5	m	4	3	6	6	2
New Zealand	529	3	10	6	6	6	9	6	7
Australia	528	4	8	6	8	6	6	3	6
Ireland	527	2	5	3	2	5	4	1	4
Hong Kong-China	525	5	1	4	7	1	1	5	4
Korea	525	3	1	3	6	1	1	a	9
United Kingdom	523	4	8	3	8	9	3	7	7
Japan	522	6	2	m	3	m	5	c	m
Sweden	516	1	4	7	7	4	7	7	3
Austria	507	10	4	9	1	7	3	9	2
Belgium	507	10	9	8	2	9	6	8	8
Iceland	507	1	4	5	1	1	8	m	1
Norway	505	2	9	7	7	3	9	6	1
France	505	m	3	m	m	5	4	7	m
United States	504	5	9	5	2	7	4	6	3
Denmark	497	2	7	6	1	5	3	7	2
Switzerland	494	7	8	10	4	10	5	10	5
Spain	493	2	2	1	8	3	2	3	3
Czech Republic	492	8	6	8	3	9	7	c	9
Italy	487	7	3	6	3	3	8	c	7
Germany	484	10	10	10	4	10	6	9	8
Liechtenstein	483	m	6	10	7	6	5	10	m
Hungary	480	9	5	4	5	8	6	3	8
Poland	479	9	7	3	6	6	7	c	7
Greece	474	8	6	m	6	5	7	8	6
Portugal	470	6	6	2	6	8	3	3	10
Russian Federation	462	4	4	2	6	4	8	3	3
Latvia	458	5	9	9	2	2	10	3	4
Israel	452	8	10	1	9	6	1	3	5
Luxembourg	441	5	8	9	10	10	4	9	m
Thailand	431	3	1	7	10	1	8	c	4
Bulgaria	430	9	8	4	2	8	9	c	9
Mexico	422	7	2	1	8	8	2	9	6
Argentina	418	9	10	m	10	10	9	c	10
Chile	410	8	3	8	9	6	3	c	10
Brazil	396	6	2	5	9	3	2	c	5
FYR Macedonia	373	6	5	1	9	5	10	10	9
Indonesia	371	4	1	9	4	2	2	c	2
Albania	349	7	7	m	5	7	10	c	6
Peru	327	10	6	7	10	9	1	c	8

Note: Data for this figure are shown in: Table 4.1 (mean student performance in reading literacy and between-school variance per country [in absolute numbers]); Table 4.2 (standard deviation in student performance in reading literacy); Table 6.1 (teachers with an ISCED 5A qualification in the language of instruction and educational resources); Table 6.3 (difference in reading performance between top and bottom quarter on parents' occupational status; reading advantage of female students and reading disadvantage of non-native students); Table 3.8 (variance jointly explained by student background characteristics, school context and school resources).

1. Selected indicators measured by decile scores. A score of 1 means that the country is among the top 10 per cent of PISA countries and has comparatively high equity, a score of 10 means that the country is among the bottom 10 per cent of PISA countries and has comparatively low equity.

2. Difference between top and bottom quarter of schools as characterised by the occupational status of students' parents (HISEI).

Quality

- Statistically significantly above the OECD average
- Not statistically significantly different from the OECD average
- Statistically significantly below the OECD average (450-493 points)
- Statistically significantly below the OECD average (400-449 points)
- Statistically significantly below the OECD average (less than 400 points)

Equity

- High equity (decile score 1-2)
- Medium-high equity (decile score 3-4)
- Medium equity (decile score 5-6)
- Medium-low equity (decile score 7-8)
- Low equity (decile score 9-10)

A relationship between overall variation in student performance and country mean performance is more difficult to establish (Table 4.2). For example, Belgium and New Zealand combine a comparatively high overall performance with wide variation in student performance.

The degree to which student performance is dependent on background

Many of the results in this report speak to the issue of equity. When looking at the effectiveness of policy-amenable school characteristics PISA 2000 results showed a strong impact of student background characteristics and their aggregates at the school level. The analyses primarily used these contextual effects as control variables, but substantive interpretations in terms of the dependency of educational performance on student background characteristics should also be considered. The dependency of student performance on background characteristics, such as socio-economic status, should be seen as an aspect of inequity. In some education systems this dependency is larger than in others, and to the degree that performance is less dependent on such student background conditions and their aggregates, such education systems can be seen as more equitable. The superior performance of autonomous and private schools could be largely attributed to these student background characteristics.

In every country a significant advantage was found for students whose parents have higher status jobs. The OECD countries with consistently small differences and low correlations between socio-economic status and student performance in all three domains are Canada, Finland, Iceland, Italy, Korea and Norway, whereas Germany and Hungary are the OECD countries that show most consistently large differences and high correlations. Of the partner countries, Hong Kong-China shows most consistently small differences and low correlations, whereas the partner countries Argentina and Chile reveal the most consistently strong disadvantages for students whose parents have low occupational status (Table 6.2).

The amount of student performance variation jointly explained by student background characteristics and policy-amenable school characteristics could also be interpreted as an indicator of equity or inequity. If the amount of variance jointly explained is relatively high this indicates the degree to which students with favourable background characteristics receive better conditions of schooling. The amount of differences between schools in student performance that is jointly explained by the school resources and student characteristics and the school context is highest in Belgium, the Czech Republic, Germany, Hungary, Italy, Korea, New Zealand, Poland, Portugal and the United Kingdom, as well as in the partner countries Argentina, Bulgaria, Chile, FYR Macedonia and Peru.

Finally, the disadvantage in reading literacy performance of non-native students is largest in Austria, Germany, Mexico and Switzerland, and the partner countries Liechtenstein and FYR Macedonia.

High quality and equity can go together

When examining the patterns shown in Figure 6.1 more globally, countries with higher mean student performance in reading literacy tend to have better positions on the equity-related indicators. The Nordic countries have some of the most equitable education systems. Countries with relatively low equity on three or more equity indicators are Belgium, Germany, and Switzerland, and the partner countries Argentina, Bulgaria, FYR Macedonia, Latvia and Peru. However, Austria, Belgium and the United Kingdom have education systems that score comparatively high on quality in terms of mean student performance in reading literacy, but have low equity on some measures.

Policy implications

After adjustments for student background conditions, only a relatively small part of the between-school variance is explained by the school input characteristics measured in PISA 2000. For methodological reasons this conclusion should be interpreted cautiously. It should not be forgotten that all effects are comparative effects, and that some conditions in industrialised countries may be at a level where incremental improvements no longer make much of a difference with respect to performance. In particular, less advantaged students are likely to profit most from favourable conditions of schooling. The mixed patterns according to which selected school variables appeared to work in different countries imply that there are no universally applicable recipes for school improvement when it comes to school inputs.

In PISA, school climate to some extent refers to affective components and also to perceptions of conditions that favour or constrain good work at school. Thus, such affective and subjective aspects do matter and should not be overlooked in school improvement and systemic reform. Moreover, these affective and relatively subjective perspectives may also be seen to reflect a more objective state of affairs such as the amount of time that students can work undisturbed in classrooms. PISA does not collect data from teachers on these aspects, so it is not possible to triangulate the perceptions of students and principals, *i.e.* to bring additional data sources to speak on the same issues.

From the perspective of school improvement it is important to separate the effects of contextual factors and factors that are directly amenable to education policy. However, from the perspective of parents who select a school for their children, the observed performance differences between schools may be more important. The impact of student background characteristics, particularly aggregated to the school level (reflecting characteristics of the composition of the school), can also be the object of educational policy. Selection and admission policies, as well as the establishment of quota for children with specific background characteristics are cases in point. Results from PISA 2000 do not provide precise suggestions as to which school composition would be optimal. More basic research studies, however, seem to imply that, within certain limits of between-student aptitude differences, heterogeneous school and class composition works better for disadvantaged students (Schuemer, 2003). However, as an overall focus and concern of educational policy, school composition as well as explicit and implicit selection mechanisms deserve a high priority on the educational policy agenda.

A striking result was the advantage that comprehensive education systems appear to have in terms of student performance (quality). PISA 2000 results suggest that the performance of students enrolled in comprehensive education systems is less dependent on their socio-economic background.

At first sight, both autonomy and private schooling are significantly positively associated with performance. In the interpretation of this finding it is, however, important to recognise that there are many factors that affect school choice. Insufficient family wealth can, for example, be an important impediment to students wanting to attend independent private schools with a high level of tuition fees. Even government-dependent private schools that charge no tuition fees can cater for a different clientele or apply more restrictive transfer or selection practices. One way to examine this is to adjust for differences in the socio-economic background of students and schools. The impact of this contextual effect on school performance tends to be strong in most countries and, once it is accounted for, an advantage of private schools is no longer visible. This suggests that private schools may realise a significant part of their advantage not only from the socio-economic advantage that students bring with them, but even more so because their combined socio-economic intake allows them to create a learning environment that is more conducive to learning.

That said, while the performance of private schools does not tend to be superior once socio-economic factors have been taken into account, in many countries they still pose an attractive alternative for parents looking to maximise the benefits for their children, including those benefits that are conferred to students through the socio-economic level of schools' intake.

Finally, PISA 2000 has also shown signs of input inequity, in the sense that schools with larger proportions of students with a lower socio-economic background have relatively less favourable educational conditions. Compensatory policies and special programmes for disadvantaged learners might potentially counter these kinds of inequities. Research on school reform indicates that structured teaching approaches and the provision of remedial activity where needed can significantly improve the performance of disadvantaged learners (*e.g.* Slavin, 1996).

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Annex

A

THE PISA 2000 DATABASE, THE VARIABLES INCLUDED IN AND EXCLUDED FROM THE ANALYSES, AND THE METHODOLOGY USED

The PISA 2000 database and an analysis of school factors

Table A1.1 presents the description and names of all variables from the PISA 2000 database that are of importance for the analyses presented in this report.

Table A1.1
Description of PISA 2000 variables that are of interest in an analysis of school factors

General variables	
Reading literacy scores of the students	pv1read pv2read pv3read pv4read pv5read
Mathematical literacy scores of the students	pv1math pv2math pv3math pv4math pv5math
Scientific literacy scores of the students	pv1scie pv2scie pv3scie pv4scie pv5scie
Identifiers for students, schools and country	stidstd schoolid country
Student final weight	w_fstuwt
School weight (in school file)	wnrschbw
Weight adjustment factor for mathematics	w_mfac
Weight adjustment factor for science	w_sfac
Country reading adjustment factor	cntrfac
Country mathematics adjustment factor	cntmfac
Country science adjustment factor	cntsfac
Main school factors	
Material and physical resources	
Index of the quality of schools' physical infrastructure	scmatbui (inverse of it)
Index of the quality of schools' educational resources	scmatedu (inverse of it)
Proportion of computers available to 15-year-olds	percomp
Number of computers per student per school	ratcomp[1]
Index of students' use of school resources	st39q01 st39q03 st39q04 st39q05[1]
Human resources	
School size	schlsize
Teacher qualification:	
- Proportion of teachers with an ISCED 5A qualification in the language of assessment, mathematics or science	propread propmath propscie
- Proportion of teachers with an ISCED 5A qualification in pedagogy	propqual[1]
- Proportion of teachers who are certified by the appropriate authority	propcert[1]
Index of teacher shortage	tcshort (inverse of it)
Student-teaching staff ratio	stratio
Average number of students in test language, mathematics and science classes	st28q01 st28q02 st28q03 (school average)[1]
Professional development	sc15q01
School curriculum	
Instructional time	sc06q01 sc06q02 sc06q03 (product of these variables and then transformed to a score of clock hours per week)
Monitoring and evaluation practices	
Index of monitoring of pupils' progress	sc16q01 sc16q02 sc16q03 sc16q04 sc16q05 (sum of these variables)
Index of school self-evaluation	sc18q04 sc18q05 sc18q06 (sum of these variables which are recoded as no=0 and yes=1)
Relevant aspects of school climate	
Index of principals' perceptions of teachers' morale and commitment	tcmorale
Student's performance is considered for school admission	sc07q02
Study programme for 15-year-olds is based on students' academic record and/or placement exams	sc09q02 sc09q03
Transfer of low achievers to another school	sc10q01
Performance information is communicated to parents, school principal and/or local education authorities	sc17q01 sc17q02 sc17q03
Index of principals' perceptions of teacher-related factors affecting school climate	teacbeha (inverse of it)
Index of principals' perceptions of student-related factors affecting school climate	studbeha (inverse of it)

Factors relevant to equity and background conditions	
School average SES	hisei (school average)
Special courses at school	st23q01 st23q02 st23q03 st23q04 [1]
Special courses outside of school	st24q01 st24q02 st24q03 st24q04 st24q05 st24q06 st24q07 [1]
School location	sc01q01 (town is contrast)
School type	schltype (public is contrast)
Funding sources of school	sc04q01 sc04q02 sc04q03 sc04q04 [1]
Type of tracks in school	sc08q01 sc08q02 sc08q03 sc08q04 sc08q05 sc08q06
Socio-economic status (SES)	hisei (=highest international socio-economic index of occupational status of father or mother)
Grade level	st02q01
Vocational programme (ISCED 2B, 2C, 3B, 3C)	st25q01
Age	age
Gender	st03q01 (recoded as 0=male; 1=female)
Immigration status	st16q01 st16q02 st16q03 (recoded as 0=native; 1=child and parents born elsewhere)
Other relevant factors	
Time in minutes spent each week at school in reading, mathematics and science courses	st27q01 st27q03 st27q05
Index of time spent on homework	hmwktime [1]
Homework	st32q01 st32q02 st32q03 st32q04 st32q05 st32q06 st32q07
Index of teacher support	teachsup (school average)
Index of achievement press	achpress (school average)
Index of teacher-student relations	studrel (school average)
Index of students' sense of belonging in school	belong (school average)
Index of disciplinary climate	disclima (inverted school average)
Process related school variables:	
- Index of school autonomy	schauton
- Index of teacher autonomy	tchparti
- Special courses for students and staff members	sc12q01 sc12q02 sc12q03 sc12q04 sc12q05
Decision-making related school variables:	
- Personnel management[2]	sc22q01 sc22q02 sc22q03 sc22q04
- Financial resources[2]	sc22q05 sc22q06
- Student policies[2]	sc22q07 sc22q08 sc22q09
- Curriculum and instruction[2]	sc22q10 sc22q11 sc22q12

1. These variables have not been used in the analysis (see Section "PISA variables excluded from the analyses" for explanation).
2. The four indices for the domains of decision-making – personnel management, financial resources, student policies, and curriculum and instruction – were derived from an exploratory factor analysis. Data entered in these analyses were based on a recoding of each of the variables sc22q1 to sc22q12. The original string variables were recoded to a numeric variable representing the highest level that was ticked by the respondents as having the main responsibility. These recoded data were weighted by the school (wnrschbw) and by country (to ensure an equal representation of countries in the analyses).

PISA variable or indices used for student characteristics

Socio-economic status (SES)

Students were asked to report their mothers' and fathers' occupations, and to state whether each parent was: in full-time paid work; part-time paid work; not working but looking for a paid job; or "other". The open-ended responses were then coded in accordance with the International Standard Classification of Occupations (ISCO 1988).

The PISA ***International Socio-Economic Index of Occupational Status*** (ISEI) was derived from students' responses on parental occupation. The index captures the attributes of occupations that convert parents' education into income. The index was derived by the optimal scaling of occupation groups to

maximise the indirect effect of education on income through occupation and to minimise the direct effect of education on income, net of occupation (both effects being net of age). For more information on the methodology, see Ganzeboom *et al.* (1992). Values on the index range from 0 to 90; low values represent low socio-economic status and high values represent high socio-economic status.

Immigration background

Students were asked if they, their mother and their father were born in the country of assessment or in another country. The response categories were then grouped into two categories: *i)* ***native*** students (those students born in the country of assessment, including those whose parents were born in another country; and *ii)* ***non-native*** students (those born outside the country of assessment and whose parents were also born in another country).

PISA variables used for school context

School type

A school was classified as either public or private according to whether a public agency or a private entity had the ultimate power to make decisions concerning its affairs. A school was classified as ***public*** if the school principal reported that it was controlled and managed directly by a public education authority or agency; or controlled and managed either by a government agency directly or by a governing body (council, committee, etc.), most of whose members were either appointed by a public authority or elected by public franchise. A school was classified as ***private*** if the school principal reported that it was controlled and managed by a non-governmental organisation (*e.g.* a church, a trade union or a business enterprise) or if its governing board consisted mostly of members not selected by a public agency. A distinction was made between government-dependent and government-independent private schools according to the degree of a private school's dependence on funding from government sources. School principals were asked to specify the percentage of the school's total funding received in a typical school year from: government sources; student fees or school charges paid by parents; donations, sponsorships or parental fund-raising; and other sources. Schools were classified as ***government-dependent private*** if they received 50 per cent or more of their core funding from government agencies. Schools were classified as ***independent private*** if they received less than 50 per cent of their core funding from government agencies.

PISA variables or indices used for school climate

Disciplinary climate

The PISA index of ***disciplinary climate*** summarises students' reports on the frequency with which, in their <class of the language of assessment> the teacher has to wait a long time for students to <quieten down>; students cannot work well; students don't listen to what the teacher says; students don't start working for a long time after the lesson begins; there is noise and disorder; and, at the start of class, more than five minutes are spent doing nothing. A four-point scale with the response categories "never", "some lessons", "most lessons" and "every lesson" was used. The index was derived using WARM estimator, and was inverted before scaling so that low values indicate a poor disciplinary climate.

Index of school principals' perceptions of student-related factors affecting school climate

The PISA index of the ***principals' perceptions of student-related factors affecting school climate*** was derived from principals' reports on the extent to which learning by 15-year-olds in their school was hindered by: student absenteeism; disruption of classes by students; students skipping classes; students lacking respect for teachers; the use of alcohol or illegal drugs; and students intimidating or bullying other

students. A four-point scale with the response categories "not at all", "very little", "to some extent" and "a lot" was used. This index was inverted so that low values indicate a poor disciplinary climate. The indices were derived using the WARM estimator.

Index of school principals' perception of teachers' morale and commitment

The PISA index of the ***principals' perception of teachers' morale and commitment*** was derived from the extent to which school principals agreed with the following statements: the morale of the teachers in this school is high; teachers work with enthusiasm; teachers take pride in this school; and teachers value academic achievement. A four-point scale with the response categories "strongly disagree", "disagree", "agree" and "strongly agree" was used. The index was derived using the WARM estimator described above.

Teacher support

The PISA index of ***teacher support*** was derived from students' reports on the frequency with which the teacher shows an interest in every student's learning; the teacher gives students an opportunity to express opinions; the teacher helps students with their work; the teacher continues teaching until the students understand; the teacher does a lot to help students; and, the teacher helps students with their learning. A four-point scale with the response categories "never", "some lessons", "most lessons" and "every lesson" was used. The index was derived using the WARM estimator.

Pressure to achieve

The PISA index of ***achievement press*** was derived from students' reports on the frequency with which, in their <class of the language of assessment>: the teacher wants students to work hard; the teacher tells students that they can do better; the teacher does not like it when students deliver <careless> work; and, students have to learn a lot. A four-point scale with the response categories "never", "some lessons", "most lessons" and "every lesson" was used. The index was derived using the WARM estimator, "never" was recoded as 1 and all other response categories were recoded as 0, before scaling.

Teacher-student relations

The PISA index of ***teacher-student relations*** was derived from students' reports on their level of agreement with the following statements: students get along well with most teachers; most teachers are interested in students' well-being; most of my teachers really listen to what I have to say; if I need extra help, I will receive it from my teachers; and most of my teachers treat me fairly. A four-point scale with the response categories "strongly disagree", "disagree", "agree" and "strongly agree" was used. The index was derived using the WARM estimator; "strongly agree" was recoded as 1 and all other response categories were recoded as 0, before scaling.

Index of students' sense of belonging

The PISA index of ***students' sense of belonging*** in the school was derived from the students' responses to the following statements concerning their school: I feel like an outsider (or left out of things); I make friends easily; I feel like I belong; I feel awkward and out of place; other students seem to like me; and, I feel lonely. The index was derived using the WARM estimator.

PISA variables or indices used for school policies

Instructional time

The index of instructional time uses the PISA index of the ***hours of schooling per year,*** which was derived from the information which principals provided on the number of weeks in the school year for which the school operates; the number of <class periods> in the school week; and the number of teaching minutes in a single <class period>. The index was derived from the product of these three factors, divided by 60.

Index of monitoring of students' progress

School principals reported on the frequency with which 15-year-olds in their school are assessed using standardised tests; tests developed by teachers; teachers' judgmental ratings; student <portfolios>; and student assignments/projects/homework. School principals rated each form of assessment on a five-point scale with the response categories: 1 – " never", 2 – "yearly", 3 – "2 times a year", 4 – "3 times a year", and 5 – "4 or more times a year". The index was constructed by summing these ratings.

Index of school self-evaluation

School principals provided information on whether the assessment of 15-year-old students was used to compare a school's performance with <district or national> performance; monitor the school's progress from year to year; and make judgements about teachers' effectiveness. The self-evaluation index was constructed by counting the number of affirmative responses to these three items.

School and teacher autonomy

School principals were asked to report whether teachers, department heads, the school principal, an appointed or elected board or an education authorities at a higher level had the main responsibility for appointing teachers; dismissing teachers; establishing teachers' starting salaries; determining teachers' salary increases; formulating school budgets; allocating budgets within the school; establishing student disciplinary policies; establishing student assessment policies; approving students for admittance to school; choosing which textbooks to use; determining course content; and deciding which courses were offered.

The PISA index of ***school autonomy*** was derived from the number of categories that principals classified as not being a school responsibility. The scale was then inverted so that high values indicate a high degree of autonomy. The index was derived using WARM estimator.

The PISA index of ***teacher autonomy*** was derived from the number of categories that principals identified as being mainly the responsibility of teachers. The index was derived using WARM estimator.

PISA variables or indices used for school resources

Quality of the schools' physical infrastructure

The PISA index of the ***quality of the schools' physical infrastructure*** was derived from principals' reports on the extent to which learning by 15-year-olds in their school was hindered by: poor condition of buildings; poor heating and cooling and/or lighting systems; and lack of instructional space (*e.g.* in classrooms). A four-point scale with the response categories "not at all", "very little", "to some extent" and "a lot" was used. The index was derived using the WARM estimator. This index was inverted before scaling so that low values indicate a low quality of physical infrastructure.

Quality of the schools' educational resources

The PISA index of the ***quality of the schools' educational resources*** was derived based on the school principals' reports on the extent to which learning by 15-year-olds was hindered by not enough computers for instruction; lack of instructional materials in the library; lack of multi-media resources for instruction; inadequate science laboratory equipment; and inadequate facilities for the fine arts. A four-point scale with the response categories "not at all", "very little", "to some extent" and "a lot" was used. The index was derived using the WARM estimator described above. This index was inverted before scaling so that low values indicate a low quality of educational resources.

Proportion of computers available to 15-year-olds

School principals provided information on the total number of computers available in their schools and, more specifically, on the number of computers available to 15-year-olds; available only to teachers; available only to administrative staff; connected to the Internet; and connected to a local area network. The PISA index of the ***availability of computers*** was derived by dividing the total number of computers available to 15-year-olds by the total number of computers in the school.

Index of teacher shortage

The PISA index of the ***teacher shortage*** was derived from the principals' view on how much learning by 15-year-old students was hindered by the shortage or inadequacy of teachers in general, teachers in the <language of assessment>, mathematics or science. The index was derived using the WARM estimator described above. This index was inverted so that low values indicate problems with teacher shortage.

Student-teaching staff ratio

School principals indicated the number of full-time and part-time teachers employed in their schools. Principals also specified: the numbers of teachers that were <language of assessment> teachers, mathematics teachers and science teachers; the number of teachers fully certified as teachers by the <appropriate national authority>; and the numbers of teachers with a qualification at <ISCED level 5A> in <pedagogy>, at <ISCED level 5A> in the <language of assessment>, at <ISCED level 5A> in <mathematics>, and at <ISCED level 5A> in <science>.

The PISA ***student-teaching staff ratio*** was defined as the number of full-time equivalent teachers divided by the number of students in the school. In order to convert head-counts into full-time equivalents, a full-time teacher, defined as a teacher employed for at least 90 per cent of the statutory time as a classroom teacher, received a weight of 1 and a part-time teacher, defined as a teacher employed for less than 90 per cent of the time as a classroom teacher, received a weight of 0.5.

Staff professional development

The PISA index of the ***staff professional development*** was derived using the school principals' report on the percentage of teachers involved in professional development programmes. Professional development programmes included formal programmes designed to enhance teaching skills or pedagogical practices. Such programmes might or might not lead to a recognised qualification. For the purpose of this question, a programme had to be at least one full day in length and to focus on teaching and education.

PISA variables excluded from the analyses

A data reduction analysis was carried out on all variables listed in Table A1.1 to ensure that only relevant and well-measured variables were included in the analyses. The variables marked with footnote 1 in Table A1.1 were excluded from the analyses.

Variables for which there was a more reliable measure

Computers in school

The variable ***proportion of computers available to 15-year-olds*** was used in preference to the variable ***number of computers per student per school*** because the meaning of the former variable is more closely related to the students tested in PISA.

Teacher qualifications

The variables ***proportion of teachers with an ISCED 5A qualification in the language of assessment***, ***proportion of teachers with an ISCED 5A qualification in mathematics and proportion of teachers with an ISCED 5A qualification in science*** were included in the analyses instead of the other two variables ***proportion of teachers with an ISCED 5A qualification in pedagogy*** and ***proportion of teachers who are certified by the appropriate authority*** as the former three variables correlate more highly with students' literacy scores.

Funding sources

The ***funding sources*** variables were not included in the analyses as they are strongly associated with the more straightforward variable ***type of school***.

Class size

The group of variables ***average number of students in language of test, mathematics and science class*** was recorded at the student level, but in fact contains class-level variables. Inclusion of these variables would have lead to erroneous conclusions (underestimation of the standard error). Therefore, the variable ***student-teaching staff ratio*** was preferred as an indicator of the average class size.

Variables that were not robust enough for analysis

Special courses

The student variables ***special courses at school*** and ***special courses outside school*** could shed light on the equity questions discussed in this report. However, they were excluded from the analyses as the first variable applied only to a small number of PISA students and the second variable lacked scalability.

Use of school resources

The PISA index of the ***use of school resources*** was derived from the frequency with which students reported using the following resources in their school: the school library; calculators; the Internet; and <science> laboratories. Students responded on a five-point scale with the following categories: "never or hardly ever", "a few times a year", "about once a month", "several times a month" and "several times a week". The internal consistency of the index was low (alpha = 0.46). However, this was considered too low to include the index in the analyses.

Time spent on homework

The PISA index of ***time spent on homework*** was derived from students' reports on the amount of time they devote to homework per week in the <language of assessment>, mathematics and science. Students rated the amount on a four-point scale with response categories "no time", "less than 1 hour per week", "between 1 and 3 hours per week", "3 hours or more per week". The ***time spent on homework*** variables were not used in the analyses as their internal consistency was too low (alpha = 0.47).

Methodology

This section presents an overview of the way in which the PISA database has been used for the secondary analyses. The nature of the analyses is described in general terms. First, some relevant features of the student performance scales are described. Second, five technical aspects of analysing the PISA data are explained. Finally, the modelling strategy followed in the secondary analyses is discussed.

Characteristics of the student performance data in PISA 2000

PISA 2000 covers three domains: reading, mathematical and scientific literacy. PISA defines reading literacy as the ability to understand, use and reflect on written texts in order to participate effectively in life, mathematical literacy as the ability to formulate and solve mathematical problems in situations encountered in life, and scientific literacy as the ability to think scientifically in a world in which science and technology shape lives (OECD, 2001). PISA aims to measure competencies that are less curriculum-tied than in the International Association for the Evaluation of Educational Achievement's (IEA) studies, including the Trends in International Mathematics and Science Study (TIMSS).

The PISA 2000 performance tests for reading literacy yielded scores on three scales: retrieving information, interpreting texts and reflection and evaluation (students' ability to relate text to their knowledge, ideas and experiences). A combined reading literacy scale summarises the results from the three reading literacy scales. The combined reading literacy scale was designed to obtain an average score of 500 points, and a standard deviation of 100 points. As a consequence about two-thirds of students across the OECD countries score between 400 and 600 points (OECD, 2001). The proficiency levels are important for the interpretation of the PISA literacy scores. Each of the three reading literacy scales is divided into five knowledge and skills levels: Level 5 corresponds with a score of more than 625 points, Level 4 with scores in the range of 553 to 625 points, Level 3 with scores between 481 and 552 points, Level 2 with scores between 408 and 480 points, and Level 1 with scores between 335 and 407 points (OECD, 2001). Based on expert panel advice, a substantive interpretation is given to these proficiency levels, such that scoring at a particular level provides a clear indication of students' abilities.

Mathematical literacy is measured on a single scale, again with a mean of 500 and a standard deviation of 100. No attempts have been made to define proficiency levels for this scale. A similar design and interpretation was made for the scale that was used for measuring scientific literacy in PISA 2000 (OECD, 2001).

Technical considerations in the analysis of the PISA data

To analyse the PISA 2000 data five technical considerations have to be addressed: (1) the hierarchically structured database, (2) the definition of "a school", (3) the weighting of students and schools, (4) the use of plausible values, and (5) the handling of missing data.

Hierarchically structured database

In the PISA study a two-stage sampling procedure was carried out in each country; first, schools were drawn and thereafter students within schools. This resulted in a hierarchically structured database. Students are nested within schools, and schools are nested within countries. Multilevel models can represent the PISA sampling strategy. Multilevel analyses allow for modelling the sampling error at all levels that can be distinguished in a hierarchically structured database. In an analysis per country the variance in students' literacy scores is attributed to two levels: a student level and a school level. In an analysis that includes all OECD countries, or all countries that participated in PISA 2000, three levels are distinguished: the country, the school and the student level. For details about the modelling techniques used, see Snijders and Bosker (1999). Multilevel statistical models have been used for the estimation of the parameters of interest by means of the software package MLwiN, version 1.10 (Rasbash *et al.,* 2000).

The definition of a school

Country differences

The organizational unit of a school may have certain country-specific characteristics that should be taken into consideration when making international comparisons. The PISA study was primarily designed as a yield study on the performance of 15-year old students. These students are in schools that may differ between countries according to the specific structure of the educational system. Some systems are highly institutionally differentiated whereas others are more integrated. Given the fact that an age-based sample was drawn, 15-year-old students may be in different grades of the particular school they are in. In some extreme cases (*e.g.* France), some of the 15-year-olds may be in lower secondary schools and others in upper secondary schools. In some countries, PISA students attend schools that are relatively simple single-site organisations, while in other countries a school comprises networks of several school sites.

Controlling for differences

These intricacies surrounding schools can partly be tackled on the basis of information within the database that makes it possible to analyse the effects of certain institutional variations, or to control for the possibly confounding effects of certain other characteristics. Chapter 4 examines the possible effects of school systems being differentially structured, focusing on the differences between selective and comprehensive systems. The possibility that students may be at different grade levels is controlled by including grade level as a contextual variable in all multilevel analyses. It was decided not to include France in the reporting on school factors.

Analysis of the effectiveness of different conditions of schooling versus different organisational units

It could be argued that differences among countries in school structure, in the sense of grade-levels that are covered, and sometimes even with respect to the level of education offered (ISCED lower secondary or upper secondary), complicate an internationally comparative assessment of school effectiveness. Indeed, if the objective were to compare schools as organisational units one could question the sense of comparing structures that may vary from primary/secondary school combinations (15-year-olds enrolled in the highest grades) to upper secondary schools (15-year-olds enrolled in the first or second grade). However, when this report makes associations between school characteristics and student performance these should rather be interpreted in the sense of the effectiveness of certain conditions of schooling to which 15-year-olds are exposed. The degree to which such associations can be validly compared among countries depends upon whether it can be assumed that students have been exposed to the school characteristics in question for a period that is long enough for these conditions to have taken effect.

This issue is related to the question whether survey data on conditions of schooling, such as aspects of the school climate, collected at the time when performance assessment takes place, could be expected to reveal causality, given the assumption of temporal precedence of the causal conditions. Two arguments are of relevance for this question: the degree to which the items in the PISA background questionnaires address issues that refer to relatively stable school characteristics and the periodicity the respondents have in mind when they answer the questions (are they asked about state of affairs that are clearly fixed to a specific recent event or about conditions that are more indefinite). Most of the issues addressed in the school and student questionnaires refer to relatively stable conditions and respondents are rarely given a specific, short-term reference (exceptions are the references to students' last report in the student questionnaire). When 15-year-olds are enrolled in the last grade of a combined primary and lower secondary programme, responses could theoretically be expected to include a longer experiential basis and in this sense be more valid, than when the students are in their first year of study at the upper secondary level of education. To what extent this would really be the case is a matter of speculation.

Nevertheless the time students have been enrolled in the particular school when the data were collected is a relevant issue for the comparability of the responses on school conditions. There is far less reason for concern if the students have been enrolled in the school for a year or more. According to the data in the table below, this would imply that for Japan, Korea and Poland the association of school characteristics and performance should be interpreted cautiously. In these countries nearly all students most probably entered their present school less than one year before the time of data collection for the PISA 2000 survey. In the partner country FYR Macedonia this concerns 60 per cent of the students and in Austria, the Czech Republic, France, Hungary and Mexico a sizable minority of the students (approximately 40%) entered their present school less than one year before the time of data collection.

The table below shows for each country the percentage of 15-year old students whose grade level equals the lowest level provided by the school in which they are enrolled.

Table A1.2
Percentage of students enrolled in the lowest grade level provided by their school

	%		%
Australia	1	Albania	18
Austria	46	Argentina	15
Belgium	4	Brazil	13
Canada	14	Bulgaria	18
Czech Republic	40	Chile	16
Denmark	6	Hong Kong-China	3
Finland	0	Indonesia	29
France	38	Israel	12
Germany	3	Latvia	11
Greece	23	Liechtenstein	0
Hungary	43	FYR Macedonia	60
Iceland	12	Peru	4
Ireland	3	Russian Federation	20
Italy	15	Thailand	16
Japan	100		
Korea	98		
Luxembourg	2		
Mexico	45		
Netherlands	0		
New Zealand	0		
Norway	0		
Poland	98		
Portugal	11		
Spain	8		
Sweden	1		
Switzerland	13		
United Kingdom	0		
United States	26		

Note: Student grade levels are based on students' self-reports (PISA 2000 survey; student questionnaire - question 2). Grade levels provided by the school are based on reports by school principals (PISA 2000 survey; school questionnaire - question 5).

Weighting of students and schools

The student weights in the PISA 2000 database compensate for non-participation of schools and students, and for the absence of performance scores of some students within a school, and as such reduce unexpected large school or student weights. The sum of the student weights constitutes an estimate of the size of the target population, *i.e.* the number of 15-year-old students in a particular country. See Cochran (1977) and Särndal *et al.* (1992) for the underlying statistical theory. For the country-specific analyses, the student final weights were standardised to have a mean of 1 in each participating country. When the analysis is carried out on the average for the OECD countries and for all PISA countries the student final weight was multiplied by a country weight adjustment factor to assure that each country contributes equally to the calculations across countries. The school weights in the PISA database adjust for school non-response.

Use of plausible values

Proficiency measures are generally subject to measurement error. Disregarding measurement error can lead to seriously biased inferences. Therefore, the variance component attributed to measurement error must be explicitly entered into the analysis models. This has been accomplished by using five plausible values for each test score on reading, mathematics or science, rather than just one observed test score for each subject. These plausible values are available in the PISA 2000 database. Plausible values are random numbers that are drawn from the distribution of test scores that could reasonably be assigned to each individual, based on his or her Item Response Theory (IRT) proficiency score. The plausible values have been standardized so that the average of each subject is equal to 500 and the standard deviation equals 100 for the OECD countries, with equal contribution per country. Only the use of all five plausible values will give the correct results. For that reason the five plausible values of each student are conceived as an extra level in the analyses: five plausible values are nested within students, students are nested within schools and schools are nested within countries. By means of repeated measures modelling in MLwiN the variance components of each level can be estimated correctly. More detailed information on this issue can be found in the users guide of MLwiN (Rasbash *et al.,* 2000).

Handling of missing data

Missing data for PISA variables were handled in different ways depending on the type of scale the variable in question was measured on.

Variables on a continuous scale

If the missing value was a variable that was measured on a continuous scale, the missing value was replaced by the weighted school average of the variable, or, if no school average could be calculated, the weighted country average was imputed. In both cases the standardised final student weight was used. In case of a missing value for a continuous school variable, this value was also replaced by the weighted country average (school weight).

Categorical or dichotomous variables

Categorical student or school variables were re-coded as dummy variables, and, if a student or a school had a missing value for a categorical variable, another dummy variable was added. Thus, no replacement of the missing value itself was made. This means that such a student or school has the value 0 for all dummy variables that correspond with the original categorical variable, except for the dummy variable that indicates that the score is missing.

Quality control

To ensure that missing data in the PISA 2000 database did not adversely affect the results of the analyses, missing dummy variables were added to the models. The dummy variable was coded to 0 if a student's or a school's value for the corresponding variable was known and to 1 if it was unknown, *i.e.* missing.

Modelling strategy

Model 1 – an empty or null model

As part of the multilevel analysis an empty model was always fitted first.[1] An empty model is a model without explanatory variables. It provides an estimation of the partitioning of the total variance into variance components at the respective levels. This initial analysis indicates the proportion of the total variance in students' test scores that is due to measurement error, the proportion at the student level, the proportion at the school level, and the proportion at the country level. The empty model is also used as a reference model for more extended models (with at least one explanatory variable).

Model 2 – extended model containing one or more explanatory variables

The next two steps in the analyses consist of adding explanatory variables at the student level and at the school level respectively. Models are compared hierarchically, that is, a so-called extended model in which one or more explanatory variables are present is compared with a so-called restricted model in which these explanatory variables are not present. Comparison of the residual variance at the various levels shows how much variance at the student, school or country level is explained by the added explanatory variable(s) of the extended model. The percentage of variance explained by the added variables is given by:

$$\frac{\text{Variance restricted model} - \text{Variance extended model}}{\text{Variance restricted model}}$$

Value-added approach – adjustment for student background variables

A value-added approach was used to estimate the impact of policy-amenable school characteristics on the educational performance measures. Ideally, to assess the relative impact of policy-amenable school

Table A1.3
Variables used to control for student characteristics and school context in the value-added model

Student characteristics
Grade level (deviation from country mode)
Age
In vocational programme (ISCED 2B, 2C, 3B or 3C)
Socio-economic status: The highest occupational status of either parent (HISEI)
Female student
Immigrant
School context
School average socio-economic status: the average of the highest occupational status of either parent (HISEI) of all students enrolled in the school
School type: Public school, private government-dependent school, and private government-independent school
School location: Village (less than 3 000 inhabitants), small town (3 000-15 000 inhabitants), town (15 000-100 000 inhabitants), city (100 000-1 000 000 inhabitants), and large city (more than 1 000 000 inhabitants)

characteristics on student performance, the students' achievement levels when they entered school should be taken into account. PISA does not include data on students' previous achievement or students' scores on aptitude tests, so selected PISA variables have been used as proxies to adjust for these student characteristics: the students' socio-economic status (SES), age, gender and immigration status, plus the students' grade level and whether or not they are enrolled in a vocational programme (Table A1.3). All these explanatory variables were included in the restricted model and as such the value-added model corrects outcomes for student background factors. The model allows an analysis of the extent to which student background factors explain the student performance differences within schools and between schools, and even between countries when the analysis is conducted for all the OECD countries or all PISA countries on average.

Extension of the value-added model

Subsequently, the value-added model was extended by introducing policy-amenable school characteristics in groups, *e.g.* school resources, school climate, school policies and equity-related school factors. Such value-added models allowed an analysis of the unique effect of each group of policy-amenable school variables on the educational performance of students. Table A1.4 presents an overview of the models run in the analyses for this thematic report. The main outcome variable in this report is student performance in reading literacy. To check the stability of the models, student performance in mathematical literacy and scientific literacy were also used as outcome variables for aggregate analyses of OECD countries and all countries participating in PISA 2000.

Table A1.4
Models run in the analyses

Empty or null model	
Value added model I	(Adjustment for student characteristics)
Value added model II	(Adjustment for student characteristics and school context)
School climate model I	(Gross effect)
School resources model I	(Gross effect)
School policies model I	(Gross effect)
School climate model II	(Adjustment for student characteristics and school context)
School resources model II	(Adjustment for student characteristics and school context)
School policies model II	(Adjustment for student characteristics and school context)
All school variables model (School climate, resources, policies)	(Adjustment for student characteristics and school context)
School type I (public/private)	(Gross effect)
School type II	(Adjustment for student characteristics and school context)

How to analyse and interpret the relative impact of student characteristics, school context and policy-amenable school characteristics on student performance

A serious problem with regard to the interpretation of the results of the analyses relates to the possible overlap between how much variance in student performance is explained by background or contextual variables and policy-amenable school characteristics. When referring to background or contextual variables it is important to distinguish between variables at the student level (*e.g.* students' socio-economic status) and variables aggregated to the school level (*e.g.* the school average socio-economic status). In statistical terms, the between- and within-school regression lines are the same in the value-added model if predictor variables on the school level are not included. To model separate between- and within-school regression

lines it is necessary to introduce the school average socio-economic status as a predictor at the school level. To establish how much variance in student performance is explained by policy-amenable school factors, both the student-level variables and the school-level variables are taken into account. The interaction between school-level variables and student-level variables can work in two directions. For example, maybe schools set high standards because their students come from a favourable home background, *i.e.* the higher expectations of students create better school conditions. Conversely, this could work in the other direction so that schools with better conditions attract students from a more favourable home background because their standards are high, *i.e.* better school conditions create a more favourable school composition. Both relationships are plausible and it is quite likely that the relative importance of the two effects varies across countries. Figure A1.1 presents the different influences on student performance. Arrow A reflects the direct effect that school variables have on student performance, but these variables may also affect student performance indirectly (the arrows C and B show this indirect effect). This would be the case if schools with an enriched curriculum attracted mainly students from an advantaged background. Similarly, arrow B shows the direct effect of background, while the arrows A and D show the indirect effect. Arrow D shows the change in school variables as a result of changes in the student population. Unfortunately, it is impossible to estimate this model on the basis of the cross-sectional data collected in the PISA 2000 survey. Longitudinal data would be required to estimate the dynamics of the interrelationships between school average socio-economic background and policy-amenable school factors. With longitudinal data one could analyse to what extent changes in the policy-amenable school factors lead to changes in the schools' student population, and to what extent policy-amenable school factors are affected by changes in the student population.

Figure A1.1

Interrelations between policy-amenable school factors, school context and student performance

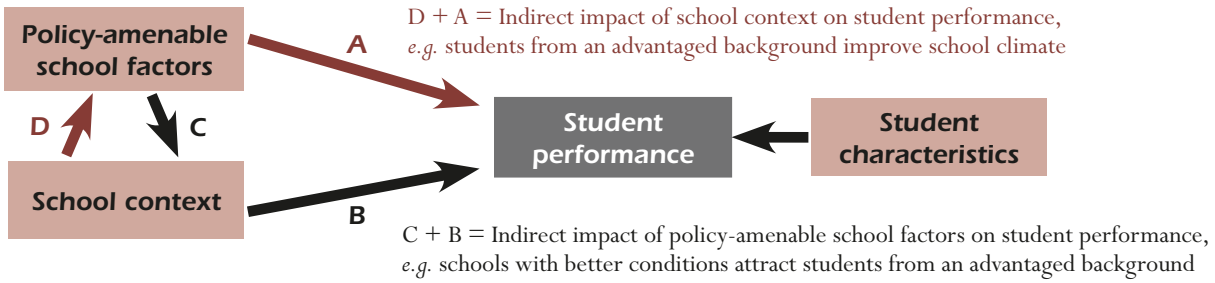
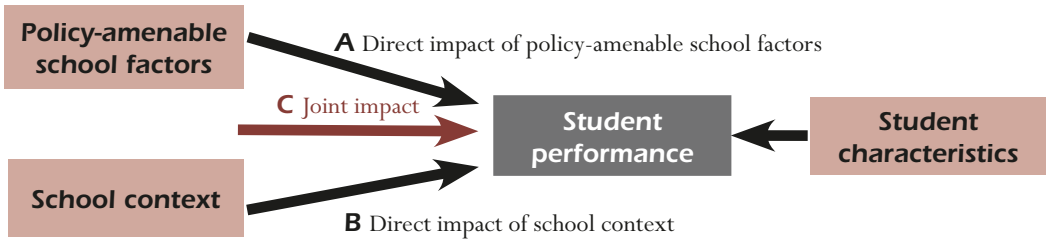


Figure A1.2 shows that PISA data only allow an estimate of how much variance in student performance is jointly explained by the school average socio-economic status and the policy-amenable school factors (arrow C), and how much variance in student performance is uniquely explained by policy-amenable school factors (arrow A) and uniquely explained by the school average socio-economic status (arrow B). Without further information it is impossible to say how much of the variance that is jointly explained is accounted for by the policy-amenable school factors and how much is accounted for by the school average socio-economic status. It is only known for certain that some part of the variance that is jointly explained is actually explained by an indirect impact of the policy-amenable school factors, while the other part is explained by an indirect impact of the school average socio-economic status.

Figure A1.2

Interrelations between policy-amenable school factors, school context and student performance that can be measured in the PISA data



The unique impact of the student background variables was estimated in a similar way as the unique impact of the policy-amenable school variables. All analyses were carried out with the value-added model (the model with student background variables, but without school average socio-economic status and policy-amenable school variables) as a baseline. First, the policy-amenable school variables were added to the value-added model, followed by the school average socio-economic status. The additional explained percentage of variance at the school level of the school average socio-economic background is the unique impact of this group of variables. If the unique impact of the policy-amenable school factors and the unique impact of the school average socio-economic status are subtracted from the total effect of both groups of variables, the joint impact is obtained. This overlapping proportion of explained variance at the school level is a measure for the joint impact of policy-amenable school factors and school average socio-economic status.

Notes

1. All multilevel models were fitted by means of the RIGLS (restricted iterative generalised least squares) estimation method instead of the IGLS. The RIGLS method estimates the variance components and the regression parameters while taking into account the loss of degrees of freedom from estimating parameters. In case of a small number of groups the variance estimated by means of IGLS is downward biased, in the case of RIGLS it is not (Snijders and Bosker, 1999).

Annex

B

DATA TABLES

Table 2.1
Percentage of variance in student performance in reading, mathematical and scientific literacy

	Percentage at country level	Percentage at school level	Percentage at student level
Reading literacy			
OECD countries	8	35	57
Partner countries	28	35	37
All PISA countries	27	30	43
Mathematical literacy			
OECD countries	16	31	54
Partner countries	36	27	38
All PISA countries	35	25	40
Scientific literacy			
OECD countries	10	32	59
Partner countries	27	28	45
All PISA countries	26	27	47

Table 2.2

Total variance in student performance in reading literacy and proportion of between-school variance and within-school variance

		Total variance in absolute numbers	Between-school variance in absolute numbers	S.E.	Within-school variance in absolute numbers	S.E.	Proportion of between-school variance (%)	Proportion of within-school variance (%)
OECD COUNTRIES	Australia	10 738	2 181	(233)	8 557	(199)	20	80
	Austria	10 975	6 600	(543)	4 375	(87)	60	40
	Belgium	11 713	7 033	(629)	4 680	(135)	60	40
	Canada	9 318	1 929	(95)	7 389	(59)	21	79
	Czech Republic	8 955	4 838	(471)	4 117	(72)	54	46
	Denmark	9 547	1 496	(321)	8 051	(184)	16	84
	Finland	7 712	594	(136)	7 118	(159)	8	92
	France	m	m	m	m	m	m	m
	Germany	11 546	6 855	(753)	4 691	(117)	59	41
	Greece	9 977	5 011	(522)	4 966	(118)	50	50
	Hungary	9 440	6 186	(535)	3 254	(63)	66	34
	Iceland	8 504	694	(148)	7 810	(204)	8	92
	Ireland	8 749	1 571	(206)	7 178	(184)	18	82
	Italy	8 729	4 754	(603)	3 975	(43)	55	45
	Japan	m	m	m	m	m	m	m
	Korea	4 946	1 876	(205)	3 070	(71)	38	62
	Luxembourg	m	m	m	m	m	m	m
	Mexico	7 439	3 971	(315)	3 468	(73)	53	47
	New Zealand	11 634	1 872	(266)	9 762	(252)	16	84
	Norway	10 728	977	(159)	9 751	(252)	9	91
	Poland	9 866	6 188	(614)	3 678	(93)	63	37
	Portugal	9 357	3 489	(340)	5 868	(165)	37	63
	Spain	7 153	1 515	(149)	5 638	(126)	21	79
	Sweden	8 481	748	(156)	7 732	(151)	9	91
	Switzerland	9 768	4 000	(361)	5 768	(179)	41	59
	United Kingdom	10 015	2 905	(234)	7 110	(139)	29	71
	United States	11 078	3 275	(452)	7 803	(203)	30	70
	OECD average	*9 420*	*3 357*	*(364)*	*6 063*	*(139)*	*36*	*64*
PARTNER COUNTRIES	Albania	9 841	3 934	(359)	5 907	(127)	40	60
	Argentina	11 342	5 652	(518)	5 690	(164)	50	50
	Brazil	7 758	3 630	(332)	4 128	(80)	47	53
	Bulgaria	11 157	6 439	(653)	4 718	(124)	58	42
	Chile	8 992	5 016	(484)	3 976	(82)	56	44
	Hong Kong-China	6 988	3 338	(390)	3 650	(125)	48	52
	Indonesia	4 706	2 079	(195)	2 627	(46)	44	56
	Israel	11 999	5 427	(598)	6 572	(240)	45	55
	Latvia	10 409	3 139	(387)	7 270	(202)	30	70
	Liechtenstein	m	m	m	m	m	m	m
	FYR Macedonia	8 788	3 914	(465)	4 874	(146)	45	55
	Peru	11 041	6 704	(671)	4 337	(93)	61	39
	Russian Federation	8 312	3 067	(300)	5 245	(117)	37	67
	Thailand	6 077	1 927	(238)	4 150	(97)	32	68
	Average of countries participating in PISA	*9 290*	*3 629*	*(387)*	*5 661*	*(126)*	*39*	*61*
	Netherlands[1]	7 838	4 075	(575)	3 763	(154)	52	48

1. Response rate too low to ensure comparability.

Table 3.1

Percentage of the between-school variance in student performance in reading, mathematical and scientific literacy explained by student characteristics, school context and school climate, policies and resources

Average between-school variance is set at 100%

	Student characteristics (%)	School context (%)	Policy-amenable school characteristics				Unexplained variance
			All policy-amenable school characteristics[1] (%)	School climate (%)	School policies (%)	School resources (%)	
Reading literacy							
All PISA countries	45.3	20.2	5.3	4.4	0.8	0.7	29.1
OECD countries	50.5	18.3	5.8	4.5	1.1	0.9	25.4
Mathematical literacy							
All PISA countries	40.7	20.1	5.5	4.1	0.9	0.7	33.6
OECD countries	47.7	17.1	6.7	5.3	1.8	1.5	28.5
Scientific literacy							
All PISA countries	41.4	19.3	6.0	5.0	1.3	0.6	33.2
OECD countries	47.0	17.5	6.7	5.4	1.7	1.3	28.8

1. The percentage in the column *All policy-amenable school characteristics* is smaller than the sum of the percentages in the columns *School climate*, *School policies* and *School resources*. This shows that school climate, school policies and school resources are related. The sum of these three groups of variables would only equal the column *All policy-amenable school characteristics* if they were unrelated.

Table 3.2

Percentage of between-school variance in student performance in reading literacy explained by student characteristics, school context and school climate, policies and resources

Between-school variance for each country is set at 100%

		Student characteristics (%)	School context (%)	School climate, policies and resources (%)	Unexplained variance (%)
OECD COUNTRIES	Australia	48	25	7	20
	Austria	56	19	8	17
	Belgium	64	19	10	7
	Canada	45	11	6	38
	Czech Republic	60	24	4	11
	Denmark	57	7	8	28
	Finland	14	3	16	67
	France	m	m	m	m
	Germany	36	44	7	12
	Greece	55	11	6	28
	Hungary	39	42	5	14
	Iceland	20	2	25	53
	Ireland	40	33	2	25
	Italy	29	29	14	27
	Japan	m	m	m	m
	Korea	58	10	15	17
	Luxembourg	m	m	m	m
	Mexico	53	28	5	14
	New Zealand	52	24	7	17
	Norway	36	7	12	45
	Poland	50	16	15	19
	Portugal	86	7	n	7
	Spain	43	18	5	34
	Sweden	60	11	8	21
	Switzerland	38	21	18	23
	United Kingdom	33	35	11	21
	United States	57	28	n	16
	OECD average	*50*	*24*	*8*	*19*
PARTNER COUNTRIES	Albania	38	43	4	15
	Argentina	55	26	8	12
	Brazil	55	20	7	19
	Bulgaria	22	56	9	13
	Chile	65	20	6	9
	Hong Kong-China	21	28	32	19
	Indonesia	36	17	11	35
	Israel	29	30	4	38
	Latvia	38	20	9	32
	Liechtenstein	m	m	m	m
	FYR Macedonia	44	27	17	12
	Peru	54	25	4	17
	Russian Federation	14	29	12	45
	Thailand	38	20	4	38
	Average of countries participating in PISA	*46*	*26*	*9*	*20*
	Netherlands[1]	72	17	3	7

1. Response rate too low to ensure comparability.

Table 3.3

Percentage of between-school variance in student performance in reading literacy that is jointly explained by student characteristics, school context and *school climate*

Between-school variance for each country is set at 100%

		Total variance explained by student characteristics, school context and school climate (%)	Variance explained: By school climate net of student characteristics and school context (%)	Variance explained: By student characteristics and school context net of school climate (%)	Variance explained: Jointly by student characteristics, school context and school climate[1] (%)	Significant[2] improvement of the model fit ($p<0.01$)
OECD COUNTRIES	Australia	78.6	5.8	38.7	34.1	1
	Austria	79.8	4.0	66.9	8.9	1
	Belgium	89.1	6.4	33.3	49.3	1
	Canada	59.8	3.8	46.3	9.8	1
	Czech Republic	88.1	3.5	34.3	50.3	1
	Denmark	70.5	6.0	53.8	10.6	1
	Finland	22.7	6.2	10.0	6.5	0
	France	m	m	m	m	m
	Germany	85.5	4.8	31.0	49.6	1
	Greece	72.0	6.0	32.4	33.7	1
	Hungary	86.8	5.1	37.0	44.7	1
	Iceland	50.7	28.7	21.7	0.3	1
	Ireland	75.2	2.9	46.9	25.5	0
	Italy	69.9	11.1	22.5	36.4	1
	Japan	m	m	m	m	m
	Korea	81.3	13.4	13.0	55.0	1
	Luxembourg	m	m	m	m	m
	Mexico	86.0	4.2	47.3	34.5	1
	New Zealand	83.0	7.3	32.2	43.4	1
	Norway	59.1	15.8	39.9	3.5	1
	Poland	79.7	13.3	22.3	44.1	1
	Portugal	93.6	0.3	29.6	63.7	0
	Spain	66.0	4.9	35.9	25.2	1
	Sweden	80.1	8.8	48.1	23.2	1
	Switzerland	72.5	13.9	27.7	30.9	1
	United Kingdom	76.7	8.6	27.5	40.6	1
	United States	85.4	0.7	61.2	23.5	0
	OECD average	*74.7*	*7.7*	*35.8*	*31.1*	
PARTNER COUNTRIES	Albania	84.6	3.4	48.7	32.5	1
	Argentina	86.2	5.5	14.2	66.5	1
	Brazil	77.9	3.3	43.9	30.7	1
	Bulgaria	86.6	8.8	18.9	59.0	1
	Chile	91.7	6.2	24.4	61.1	1
	Hong Kong-China	61.4	12.4	20.4	28.6	1
	Indonesia	60.6	6.9	37.9	15.8	1
	Israel	61.4	2.8	29.4	29.2	0
	Latvia	65.2	7.1	31.7	26.5	1
	Liechtenstein	m	m	m	m	m
	FYR Macedonia	88.6	17.6	15.6	55.4	1
	Peru	81.9	3.4	29.8	48.7	1
	Russian Federation	49.4	6.2	20.5	22.6	1
	Thailand	62.9	4.8	30.8	27.4	1
	Average of countries participating in PISA	*74.3*	*7.4*	*33.4*	*33.8*	
	Netherlands[3]	92.1	2.6	40.1	49.4	1

1. The joint variance indicates the "overlap" in the way that school climate and student characteristics and school context influence student performance.
2. The difference between the school climate model and the school context model was tested at $\alpha=0.01$; 1 in the last column indicates that the model fit improved significantly when the school climate variables were added, and 0 indicates that it did not.
3. Response rate too low to ensure comparability.

Table 3.4

Percentage of between-school variance in student performance in reading literacy that is jointly explained by student characteristics, school context and *school policies*

Between-school variance for each country is set at 100%

		Total variance explained by student characteristics, school context and school policies (%)	Variance explained: By school policies net of student characteristics and school context (%)	Variance explained: By student characteristics and school context net of school policies (%)	Variance explained: Jointly by student characteristics, school context and school policies[1] (%)	Significant[2] improvement of the model fit (p<0.01)
OECD COUNTRIES	Australia	73.7	0.9	52.8	20.0	0
	Austria	81.3	5.5	42.8	33.0	1
	Belgium	85.7	3.1	59.7	22.9	1
	Canada	58.2	2.1	47.0	9.1	1
	Czech Republic	84.1	n	71.8	12.8	0
	Denmark	66.5	2.1	54.3	10.2	0
	Finland	27.1	10.6	9.9	6.6	0
	France	m	m	m	m	m
	Germany	83.4	2.8	43.6	37.0	1
	Greece	66.8	0.7	45.6	20.4	0
	Hungary	82.2	0.5	46.3	35.4	0
	Iceland	22.1	0.1	22.1	n	0
	Ireland	72.3	n	54.1	18.3	0
	Italy	59.9	1.0	40.7	18.2	0
	Japan	m	m	m	m	m
	Korea	70.1	2.2	53.8	14.1	0
	Luxembourg	m	m	m	m	m
	Mexico	82.9	1.1	39.3	42.5	0
	New Zealand	76.1	0.4	71.4	4.3	0
	Norway	43.5	0.2	43.0	0.3	0
	Poland	69.1	2.7	56.4	10.0	0
	Portugal	93.5	0.3	72.5	20.7	0
	Spain	61.6	0.4	43.7	17.5	0
	Sweden	70.9	n	65.6	5.7	0
	Switzerland	67.2	8.6	34.5	24.1	1
	United Kingdom	75.8	7.7	45.8	22.3	1
	United States	84.7	n	84.6	0.1	0
	OECD average	*69.1*	*2.2*	*50.1*	*16.9*	
PARTNER COUNTRIES	Albania	82.3	1.1	55.2	26.0	0
	Argentina	81.3	0.6	35.1	45.6	0
	Brazil	77.4	2.8	40.0	34.6	0
	Bulgaria	80.7	2.8	40.2	37.7	1
	Chile	88.3	2.8	38.8	46.7	1
	Hong Kong-China	49.0	n	47.3	1.7	0
	Indonesia	54.6	0.9	40.5	13.3	0
	Israel	58.8	0.1	49.3	9.4	0
	Latvia	62.4	4.3	46.8	11.3	0
	Liechtenstein	m	m	m	m	m
	FYR Macedonia	72.8	1.8	63.7	7.4	0
	Peru	78.7	0.3	52.3	26.2	0
	Russian Federation	48.4	5.2	36.4	6.8	1
	Thailand	58.3	0.1	55.5	2.6	0
	Average of countries participating in PISA	*69.0*	*2.0*	*48.7*	*18.2*	
	Netherlands[3]	89.6	0.2	73.7	15.8	0

1. The joint variance indicates the "overlap" in the way that school policies and student characteristics and school context influence student performance.
2. The difference between the school policies model and the school context model was tested at α=0.01; 1 in the last column indicates that the model fit improved significantly when the school policies variables were added, and 0 indicates that it did not.
3. Response rate too low to ensure comparability.

Table 3.5

Percentage of between-school variance in student performance in reading literacy that is jointly explained by student characteristics, school context and *school resources*

Between-school variance for each country is set at 100%

		Total variance explained by student characteristics, school context and school resources (%)	Variance explained: By school resources net of student characteristics and school context (%)	Variance explained: By student characteristics and school context net of school resources (%)	Variance explained: Jointly by student characteristics, school context and school resources[1] (%)	Significant[2] improvement of the model fit ($p<0.01$)
OECD COUNTRIES	Australia	75.0	2.2	47.0	25.8	1
	Austria	78.6	2.8	54.9	20.9	1
	Belgium	90.4	7.8	37.3	45.4	1
	Canada	56.4	0.4	53.9	2.2	0
	Czech Republic	86.2	1.6	55.7	28.9	1
	Denmark	66.7	2.3	47.8	16.7	1
	Finland	22.1	5.6	17.0	n	0
	France	m	m	m	m	m
	Germany	83.7	3.0	47.5	33.2	1
	Greece	66.3	0.2	54.4	11.7	0
	Hungary	81.4	n	78.0	3.7	0
	Iceland	28.0	5.9	20.6	1.4	0
	Ireland	73.2	0.8	64.2	8.2	0
	Italy	60.3	1.4	35.8	23.1	0
	Japan	m	m	m	m	m
	Korea	70.0	2.0	51.7	16.2	0
	Luxembourg	m	m	m	m	m
	Mexico	82.4	0.6	50.3	31.5	0
	New Zealand	76.8	1.1	63.6	12.1	0
	Norway	46.0	2.7	35.3	8.1	0
	Poland	68.3	1.9	53.3	13.1	0
	Portugal	93.2	n	74.1	19.1	0
	Spain	62.4	1.2	38.0	23.2	0
	Sweden	71.3	n	62.9	8.4	0
	Switzerland	62.2	3.6	41.2	17.4	1
	United Kingdom	69.8	1.7	54.8	13.4	1
	United States	85.7	1.0	84.1	0.6	0
	OECD average	*69.0*	*2.1*	*51.0*	*16.0*	
PARTNER COUNTRIES	Albania	81.8	0.6	58.1	23.1	0
	Argentina	81.6	0.8	52.8	27.9	0
	Brazil	76.7	2.1	48.9	25.7	1
	Bulgaria	78.0	0.2	50.3	27.5	0
	Chile	85.2	n	52.6	32.9	0
	Hong Kong-China	80.6	31.6	18.9	30.1	1
	Indonesia	56.7	2.9	28.4	25.4	1
	Israel	59.7	1.1	50.9	7.8	0
	Latvia	58.2	0.1	40.9	17.2	0
	Liechtenstein	m	m	m	m	m
	FYR Macedonia	73.5	2.5	61.3	9.7	0
	Peru	80.2	1.7	35.3	43.2	1
	Russian Federation	48.7	5.5	22.0	21.2	1
	Thailand	58.2	n	23.9	34.2	0
	Average of countries participating in PISA	*69.6*	*2.7*	*47.8*	*19.2*	
	Netherlands[3]	90.5	1.1	58.0	31.4	1

1. The joint variance indicates the "overlap" in the way that school resources and student characteristics and school context influence student performance.
2. The difference between the school resources model and the school context model was tested at $\alpha=0.01$; 1 in the last column indicates that the model fit improved significantly when the school resources variables were added, and 0 indicates that it did not.
3. Response rate too low to ensure comparability.

Table 3.6
Effects of school climate, school policies and school resources on student performance in reading literacy for OECD countries and all countries participating in PISA 2000[1]

	OECD countries		All PISA countries	
	Regression coefficient[2]	S.E.	Regression coefficient[2]	S.E.
School climate				
Index of disciplinary climate	**13.37**	(0.87)	**10.70**	(0.75)
Index of teacher support	**-12.51**	(1.04)	**-6.57**	(0.91)
Index of achievement press	**-2.84**	(0.92)	-1.64	(0.77)
Index of teacher-student relations	**-3.62**	(1.07)	**-11.22**	(0.86)
Index of students' sense of belonging at school	**17.34**	(0.89)	**24.17**	(0.74)
Index of principals' perceptions of teacher-related factors affecting school climate	**-7.95**	(1.00)	**-7.71**	(0.84)
Index of principals' perceptions of student-related factors affecting school climate	**21.02**	(1.01)	**18.22**	(0.84)
Index of principals' perceptions of teachers' morale and commitment	**4.70**	(0.80)	**6.16**	(0.67)
School policies				
Instructional time	-0.52	(1.51)	1.59	(1.33)
Index of monitoring of student progress	-0.84	(1.36)	1.34	(1.16)
Index of school self-evaluation	-0.10	(0.84)	**-1.89**	(0.72)
Student's performance is considered for school admission	**14.80**	(1.07)	**14.91**	(0.89)
Study programme for 15-year-olds is based on students' academic record	-0.38	(1.18)	-0.89	(0.97)
Study programme for 15-year-olds is based on students' placement exams	0.96	(1.15)	**2.34**	(0.89)
Transfer of low achievers to another school: likely	**29.28**	(2.60)	**24.10**	(1.97)
very likely	**42.77**	(3.54)	**36.49**	(3.05)
Performance information is communicated to parents	0.58	(1.15)	**2.83**	(0.98)
Performance information is communicated to school principal	0.80	(1.06)	1.05	(0.94)
Performance information is communicated to local education authorities	-1.45	(0.88)	**-2.12**	(0.74)
Index of school autonomy	**3.27**	(1.05)	**4.97**	(0.86)
Index of teacher autonomy	-1.13	(0.84)	-1.30	(0.71)
School resources				
School size	**15.57**	(1.28)	**15.01**	(0.87)
Index of the quality of schools' physical infrastructure	**-2.69**	(1.01)	**-1.83**	(0.80)
Index of the quality of schools' educational resources	**6.67**	(1.07)	**9.57**	(0.86)
Proportion of computers available to 15-year-olds	-0.10	(1.00)	1.74	(0.76)
Proportion of teachers with an ISCED 5A qualification in the language of assessment	**15.39**	(1.13)	**12.89**	(0.90)
Index of teacher shortage	**6.69**	(0.88)	**5.15**	(0.72)
Student-teaching staff ratio	1.53	(1.62)	**-4.04**	(1.08)
Professional development	-1.12	(0.83)	-0.89	(0.71)

Note: All explanatory variables with the exception of the dichotomous variables have been transformed into z-scores. A regression coefficient indicates to what extent the score on the dependent variable (student performance in reading literacy) tends to go up (positive effect) or down (negative effect) by an increase of one standard deviation on the specified independent variable, while all other variables are constant. In some cases the independent variables are not continuous but dichotomous (*e.g.* girls versus boys, independent private schools versus public schools). In those cases the regression coefficient indicates to what extent the score on the dependent variable tends to change if the student is a girl instead of a boy, or if the school is an independent private school instead of a public school.
1. Excluding Japan and the Netherlands.
2. Effects printed in bold are significant at $p<0.01$.

Table 3.7

Effects of school climate, policies and resources on student performance in reading literacy adjusted for student characteristics and school context for OECD countries and all countries participating in PISA 2000[1]

	OECD countries		All PISA countries	
	Regression coefficient[2]	S.E.	Regression coefficient[2]	S.E.
Student characteristics				
Grade level (deviation from country mode)	**30.31**	(0.31)	**25.77**	(0.22)
Age	**-1.85**	(0.20)	**-1.86**	(0.16)
In vocational programme (ISCED 2B, 2C, 3B or 3C)	**-29.16**	(1.00)	**-18.72**	(0.76)
Parents' occupational status (HISEI)	**15.07**	(0.21)	**13.31**	(0.17)
Female student	**24.26**	(0.39)	**22.40**	(0.32)
Immigrant	**-31.74**	(0.96)	**-22.06**	(0.81)
School context				
School average parents' occupational status (HISEI)	**23.98**	(0.64)	**24.60**	(0.55)
School type (reference category = public schools)				
Independent private schools	**-13.90**	(2.79)	**-6.88**	(2.16)
Government-dependent private schools	**4.25**	(2.04)	**5.32**	(1.19)
School location (reference category = Town 15 000 - 100 000 inhabitants)				
Village, less than 3 000 inhabitants	**6.52**	(1.83)	0.28	(1.57)
Small town, 3 000 - 15 000 inhabitants	**3.84**	(1.34)	0.91	(1.23)
City, 100 000 - 1 000 000 inhabitants	**-3.02**	(1.41)	-0.94	(1.22)
Large city, more than 1 000 000 inhabitants	**-5.21**	(2.25)	-3.39	(1.86)
School climate				
Index of disciplinary climate	**8.07**	(0.56)	**7.64**	(0.51)
Index of teacher support	**-4.41**	(0.67)	**-3.08**	(0.61)
Index of achievement press	-1.14	(0.59)	0.30	(0.52)
Index of teacher-student relations	0.24	(0.70)	**-2.18**	(0.59)
Index of students' sense of belonging at school	**5.24**	(0.59)	**7.91**	(0.52)
Index of principals' perceptions of teacher-related factors affecting school climate	**-3.90**	(0.66)	**-4.21**	(0.58)
Index of principals' perceptions of student-related factors affecting school climate	**9.61**	(0.66)	**9.00**	(0.57)
Index of principals' perceptions of teachers' morale and commitment	1.01	(0.51)	**1.90**	(0.45)
School policies				
Instructional time	0.73	(0.88)	0.95	(0.81)
Index of monitoring of student progress	0.14	(0.79)	1.10	(0.71)
Index of school self-evaluation	2.13	(0.83)	0.60	(0.72)
Student's performance is considered for school admission	**4.22**	(0.63)	**2.83**	(0.56)
Study programme for 15-year-olds is based on students' academic record	0.47	(0.69)	-0.15	(0.59)
Study programme for 15-year-olds is based on students' placement exams	0.20	(0.67)	0.75	(0.54)
Transfer of low achievers to another school: likely	**6.60**	(1.51)	**5.79**	(1.20)
very likely	**13.37**	(2.05)	**11.98**	(1.85)
Performance information is communicated to parents	1.06	(0.67)	0.92	(0.60)
Performance information is communicated to school principal	-0.10	(0.61)	-0.40	(0.57)
Performance information is communicated to local education authorities	-0.25	(0.51)	-0.22	(0.45)
Index of school autonomy	**-1.80**	(0.63)	**-2.03**	(0.56)
Index of teacher autonomy	0.52	(0.49)	0.37	(0.43)
School resources				
School size	**3.85**	(0.77)	**1.87**	(0.57)
Index of the quality of schools' physical infrastructure	**-1.64**	(0.58)	**-1.53**	(0.49)
Index of the quality of schools' educational resources	**1.66**	(0.62)	**2.73**	(0.53)
Proportion of computers available to 15-year-olds	-0.04	(0.57)	-0.30	(0.46)
Proportion of teachers with an ISCED 5A qualification in the language of assessment	**4.62**	(0.67)	**3.34**	(0.56)
Index of teacher shortage	1.03	(0.54)	0.60	(0.47)
Student-teaching staff ratio	-0.46	(0.94)	0.62	(0.67)
Professional development	-0.57	(0.48)	-0.59	(0.44)

Note: All explanatory variables with the exception of the dichotomous variables have been transformed into z-scores. A regression coefficient indicates to what extent the score on the dependent variable (student performance in reading literacy) tends to go up (positive effect) or down (negative effect) by an increase of one standard deviation on the specified independent variable, while all other variables are constant. In some cases the independent variables are not continuous but dichotomous (*e.g.* girls versus boys, independent private schools versus public schools). In those cases the regression coefficient indicates to what extent the score on the dependent variable tends to change if the student is a girl instead of a boy, or if the school is an independent private school instead of a public school.

1. Excluding Japan and the Netherlands.
2. Effects printed in bold are significant at $p<0.01$.

Table 3.8
Effects of school composition and selected aspects of school climate on student performance in reading literacy adjusted for student characteristics and school context

				School climate									
		School composition[1]	S.E.	Principals' perceptions of student-related factors affecting school climate	S.E.	Disciplinary climate	S.E.	Students' sense of belonging at school	S.E.	Teacher support	S.E.	Principals' perceptions of teacher-related factors affecting school climate	S.E.
OECD COUNTRIES	Australia	**21.00**	(3.18)	7.05	(3.47)	**8.92**	(3.16)	-3.71	(2.78)	-1.39	(3.50)	0.15	(3.33)
	Austria	**37.54**	(4.37)	**12.68**	(4.16)	-0.48	(2.57)	4.47	(2.94)	4.25	(2.91)	**-17.98**	(4.16)
	Belgium	**19.98**	(3.16)	**11.91**	(2.51)	5.77	(2.34)	6.45	(3.21)	-5.23	(3.19)	-7.51	(3.15)
	Canada	**15.89**	(1.41)	**8.07**	(1.54)	**8.14**	(1.37)	1.23	(1.23)	-1.93	(1.47)	**-4.82**	(1.43)
	Czech Republic	**37.99**	(3.64)	**14.43**	(3.08)	**6.73**	(2.10)	3.95	(3.59)	-5.65	(3.10)	-6.30	(2.82)
	Denmark	8.76	(3.43)	8.03	(3.34)	3.31	(3.49)	3.11	(2.53)	4.13	(3.79)	-5.11	(3.26)
	Finland	4.38	(3.92)	5.79	(4.38)	4.83	(3.18)	4.55	(3.86)	3.59	(3.42)	-8.02	(4.62)
	Germany	**41.89**	(3.95)	8.29	(3.96)	**9.78**	(3.05)	3.48	(3.36)	**-16.87**	(3.81)	-1.45	(4.47)
	Greece	**31.34**	(5.43)	6.98	(6.05)	7.08	(5.73)	**18.00**	(5.39)	2.54	(5.87)	-8.32	(4.64)
	Hungary	**35.52**	(3.63)	2.80	(3.21)	**13.46**	(2.72)	**8.96**	(2.66)	-7.11	(3.64)	3.28	(3.28)
	Iceland	5.36	(4.27)	9.35	(4.98)	3.79	(2.75)	2.66	(3.44)	-4.32	(4.00)	-0.55	(4.39)
	Ireland	**20.36**	(4.89)	9.30	(4.46)	4.36	(3.20)	-4.98	(3.69)	-5.08	(3.72)	-5.62	(3.28)
	Italy	**19.09**	(5.43)	**13.55**	(4.27)	**11.10**	(4.28)	0.56	(4.76)	**-30.58**	(5.79)	3.70	(3.72)
	Korea	8.11	(3.46)	**9.31**	(2.86)	**7.63**	(2.72)	**9.68**	(3.65)	-2.54	(3.50)	-5.59	(3.39)
	Mexico	**19.92**	(3.46)	0.11	(2.88)	**7.56**	(2.73)	**15.27**	(2.75)	2.80	(3.67)	-1.31	(3.34)
	New Zealand	**20.12**	(4.87)	6.40	(4.64)	1.49	(4.14)	7.84	(3.74)	-7.19	(4.64)	0.53	(4.26)
	Norway	**14.38**	(5.04)	5.40	(4.15)	6.28	(3.52)	1.22	(3.27)	-1.66	(3.95)	2.67	(4.76)
	Poland	**38.38**	(8.24)	**17.78**	(5.87)	6.27	(4.32)	**22.93**	(6.50)	**22.78**	(6.60)	-1.65	(6.42)
	Portugal	**10.44**	(2.92)	2.75	(2.65)	2.32	(3.92)	**11.08**	(2.96)	1.67	(3.30)	-0.79	(2.75)
	Spain	**12.00**	(3.49)	1.65	(2.94)	6.38	(2.75)	4.45	(3.59)	5.05	(3.06)	-0.08	(3.03)
	Sweden	**13.66**	(3.40)	6.95	(3.62)	**8.19**	(3.08)	4.00	(2.67)	4.28	(3.56)	-6.64	(2.81)
	Switzerland	**16.81**	(3.47)	9.23	(3.65)	5.26	(2.35)	**6.58**	(2.27)	**-15.81**	(3.00)	**-9.49**	(3.61)
	United Kingdom	**28.14**	(2.76)	**13.32**	(3.12)	**9.19**	(2.37)	-2.89	(2.51)	-2.70	(3.01)	-1.98	(2.67)
	United States	**32.45**	(3.70)	-3.91	(4.67)	**6.08**	(4.14)	1.98	(3.33)	-2.07	(4.18)	5.82	(4.13)
	OECD average	*23.98*	*(0.64)*	*9.61*	*(0.66)*	*8.07*	*(0.56)*	*5.24*	*(0.59)*	*-4.41*	*(0.67)*	*-3.90*	*(0.66)*
PARTNER COUNTRIES	Albania	m	m	0.85	(3.53)	7.43	(3.97)	9.79	(4.12)	3.68	(5.38)	2.22	(4.35)
	Argentina	**10.54**	(4.02)	-2.87	(3.89)	5.41	(3.78)	**21.22**	(3.48)	5.73	(3.27)	4.22	(4.83)
	Brazil	**10.61**	(2.46)	5.39	(2.18)	-4.52	(2.70)	**7.47**	(2.19)	5.88	(2.95)	-0.90	(2.33)
	Bulgaria	**34.76**	(5.90)	10.06	(4.74)	5.36	(3.27)	**26.06**	(5.32)	7.38	(4.48)	-7.76	(4.67)
	Chile	**16.68**	(3.44)	6.52	(2.73)	9.59	(3.87)	6.46	(2.62)	2.81	(3.35)	2.62	(3.16)
	Hong Kong-China	**24.72**	(6.00)	8.55	(3.41)	3.22	(4.62)	**24.95**	(6.92)	-5.25	(8.57)	-8.85	(4.03)
	Indonesia	**11.76**	(2.46)	-1.33	(2.66)	**7.19**	(2.48)	**13.48**	(3.27)	-4.95	(3.97)	0.88	(2.76)
	Israel	**32.11**	(5.93)	13.67	(7.68)	-8.70	(4.59)	7.96	(3.95)	4.46	(6.05)	-12.75	(7.08)
	Latvia	**22.80**	(5.00)	12.54	(5.46)	6.85	(4.31)	**20.06**	(5.59)	5.63	(6.34)	**-15.76**	(5.53)
	FYR Macedonia	**18.29**	(5.31)	**13.29**	(3.93)	4.69	(5.94)	**34.01**	(4.50)	-8.17	(8.21)	-10.23	(4.27)
	Peru	**20.74**	(4.28)	6.60	(4.74)	-7.43	(3.94)	**13.33**	(3.48)	4.62	(4.91)	-4.62	(5.05)
	Russian Federation	**21.35**	(4.59)	6.19	(3.38)	8.42	(3.83)	-0.62	(4.57)	8.89	(5.11)	-1.99	(3.62)
	Thailand	**12.59**	(4.46)	2.87	(3.88)	4.75	(5.79)	**13.92**	(5.27)	-7.42	(6.13)	-1.79	(3.75)
	Average of countries participating in PISA	*24.60*	*(0.55)*	*9.00*	*(0.57)*	*7.64*	*(0.51)*	*7.91*	*(0.52)*	*-3.08*	*(0.61)*	*-4.21*	*(0.58)*
	Netherlands[2]	**16.42**	(3.55)	**11.35**	(3.66)	3.57	(2.77)	**10.43**	(2.95)	-3.49	(2.92)	-3.07	(3.35)

Note: Bold figures in the table are statistically significant at $p<0.01$.
1. School average parents' occupational status (HISEI).
2. Response rate too low to ensure comparability.

Table 3.9
Effects of selected aspects of school policies and school resources on student performance in reading literacy adjusted for student characteristics and school context

		School policies								School resources					
		Transfer of low achievers to another school: very likely	S.E.	Transfer of low achievers to another school: likely	S.E.	Student's performance is considered for school admission	S.E.	Index of school autonomy	S.E.	Proportion of teachers with an ISCED 5A qualification in the language of assessment	S.E.	School size	S.E.	Index of the quality of a school's physical infrastructure	S.E.
OECD COUNTRIES	Australia	m	m	8.46	(10.75)	m	m	1.14	(3.02)	4.84	(2.50)	6.17	(4.10)	-5.40	(2.98)
	Austria	m	m	m	m	**13.14**	(3.59)	0.22	(5.58)	1.72	(4.02)	**15.28**	(4.76)	-3.43	(3.04)
	Belgium	1.43	(7.05)	-0.04	(4.75)	0.42	(2.47)	0.05	(3.64)	**12.09**	(3.12)	2.81	(3.97)	-1.38	(2.99)
	Canada	-0.09	(9.36)	**11.19**	(3.80)	-0.67	(1.27)	0.49	(1.15)	m	m	m	m	-1.24	(1.39)
	Czech Republic	-2.93	(6.39)	-2.02	(5.63)	1.40	(2.91)	-1.30	(2.32)	5.29	(3.14)	9.20	(5.69)	**-10.85**	(3.36)
	Denmark	m	m	8.65	(7.48)	4.89	(4.68)	-4.55	(4.32)	4.42	(3.27)	10.87	(9.29)	-1.11	(2.77)
	Finland	m	m	-2.57	(10.10)	6.20	(4.90)	-4.15	(4.72)	-2.93	(3.24)	11.71	(11.35)	-0.75	(2.81)
	Germany	18.10	(7.53)	16.80	(6.80)	2.67	(2.98)	1.49	(4.93)	**8.02**	(2.94)	5.02	(5.11)	3.89	(3.43)
	Greece	12.54	(9.84)	5.13	(8.99)	3.41	(9.66)	-6.95	(3.61)	m	m	-6.40	(21.51)	4.28	(3.92)
	Hungary	16.95	(10.97)	9.89	(6.11)	-6.75	(5.26)	-4.18	(3.52)	0.26	(6.24)	0.33	(7.74)	1.58	(4.08)
	Iceland	m	m	m	m	-7.23	(8.57)	-1.12	(4.34)	1.70	(3.20)	2.50	(13.60)	-5.99	(4.02)
	Ireland	m	m	23.66	(16.15)	5.12	(3.76)	2.26	(5.62)	-3.86	(7.91)	9.96	(8.48)	4.15	(3.28)
	Italy	m	m	m	m	m	m	7.58	(5.42)	3.35	(6.64)	6.08	(6.30)	2.89	(3.19)
	Korea	11.75	(23.10)	7.48	(5.03)	1.62	(2.28)	1.49	(4.50)	m	m	1.95	(3.15)	-2.11	(2.59)
	Mexico	3.65	(7.82)	-0.12	(5.91)	**9.09**	(2.85)	2.51	(2.60)	-3.46	(2.09)	1.13	(1.36)	2.88	(2.24)
	New Zealand	m	m	9.52	(16.17)	-0.43	(3.21)	0.16	(5.47)	-6.18	(3.90)	4.99	(4.40)	-7.78	(3.60)
	Norway	7.34	(29.93)	7.76	(30.35)	m	m	m	m	-1.93	(3.09)	26.54	(19.80)	0.33	(3.06)
	Poland	11.68	(14.64)	-4.08	(8.31)	-7.07	(9.87)	m	m	7.14	(14.83)	1.96	(7.77)	-6.16	(4.33)
	Portugal	-2.96	(15.95)	-5.19	(6.19)	**8.04**	(3.05)	3.25	(4.77)	1.33	(4.14)	2.65	(2.68)	-3.85	(2.14)
	Spain	3.33	(20.32)	-2.94	(8.80)	-4.74	(4.90)	-3.16	(4.87)	-1.58	(3.52)	2.58	(4.43)	-1.63	(2.57)
	Sweden	m	m	-30.19	(84.69)	-0.22	(11.11)	-3.06	(2.12)	0.21	(1.84)	-2.87	(7.71)	-2.19	(2.25)
	Switzerland	**17.30**	(6.04)	8.44	(6.64)	6.10	(2.58)	-6.91	(3.52)	**5.63**	(2.17)	-1.36	(4.32)	-6.05	(3.57)
	United Kingdom	m	m	m	m	**11.50**	(2.21)	**-11.29**	(2.58)	**7.65**	(2.62)	0.96	(2.92)	-1.29	(2.09)
	United States	17.14	(23.96)	-3.30	(11.87)	-8.72	(3.73)	-0.07	(3.14)	6.23	(4.98)	-0.95	(2.68)	-2.23	(5.23)
	OECD average	*13.37*	*(2.05)*	*6.60*	*(1.51)*	*4.22*	*(0.63)*	*-1.80*	*(0.63)*	*4.62*	*(0.67)*	*3.85*	*(0.77)*	*-1.64*	*(0.58)*
PARTNER COUNTRIES	Albania	5.94	(14.73)	11.70	(6.62)	0.07	(2.98)	-3.55	(3.65)	m	m	5.29	(6.84)	-3.28	(3.01)
	Argentina	-2.19	(13.95)	3.00	(6.65)	6.17	(4.25)	0.57	(4.61)	m	m	2.94	(5.05)	0.47	(3.37)
	Brazil	26.33	(14.18)	**19.84**	(6.20)	2.91	(2.95)	3.52	(3.00)	1.88	(2.12)	-0.10	(1.29)	-0.54	(2.12)
	Bulgaria	-15.20	(16.86)	12.81	(7.19)	5.38	(4.37)	1.94	(4.35)	3.37	(5.47)	-4.02	(7.12)	-5.66	(3.70)
	Chile	14.50	(9.32)	7.03	(5.00)	**8.58**	(3.16)	-0.10	(2.69)	-0.17	(1.40)	2.88	(2.63)	1.99	(2.47)
	Hong Kong-China	1.79	(11.85)	3.97	(6.45)	-3.82	(6.22)	-7.19	(5.71)	2.99	(4.40)	25.53	(14.18)	-3.77	(4.67)
	Indonesia	-13.10	(8.91)	-6.70	(4.56)	0.43	(2.45)	-1.31	(2.24)	0.67	(1.56)	-1.15	(4.82)	-1.65	(1.66)
	Israel	11.63	(14.92)	3.03	(10.43)	-4.25	(6.30)	-4.00	(7.13)	m	m	11.96	(6.66)	-1.06	(4.99)
	Latvia	-31.12	(14.08)	-17.09	(9.17)	-5.65	(5.65)	-5.95	(5.89)	-1.76	(5.06)	-1.17	(6.54)	5.59	(5.33)
	FYR Macedonia	6.75	(12.05)	-0.05	(6.91)	-28.13	(11.89)	1.94	(4.01)	-1.49	(3.37)	5.39	(4.31)	-6.33	(3.50)
	Peru	4.84	(14.58)	5.14	(7.85)	2.38	(3.51)	3.84	(4.17)	7.54	(4.48)	0.89	(2.25)	0.16	(3.29)
	Russian Federation	16.52	(13.71)	7.50	(7.12)	-8.42	(3.61)	-3.44	(3.84)	6.10	(4.95)	3.00	(5.53)	1.51	(2.75)
	Thailand	31.50	(43.96)	-7.57	(5.83)	-2.02	(3.33)	-1.12	(4.55)	2.74	(2.92)	0.76	(2.13)	-0.90	(2.94)
	Average of countries participating in PISA	*11.98*	*(1.85)*	*5.79*	*(1.20)*	*2.83*	*(0.56)*	*-2.03*	*(0.56)*	*3.34*	*(0.56)*	*1.87*	*(0.57)*	*-1.53*	*(0.49)*
	Netherlands[1]	12.44	(9.73)	6.82	(5.87)	-2.41	(2.60)	-1.92	(2.62)	-2.21	(2.91)	-1.19	(2.80)	0.25	(3.38)

Note: Bold figures in the table are statistically significant at $p<0.01$.
1. Response rate too low to ensure comparability.

Table 4.1

Indicators of institutional differentiation and of realised educational differentiation in the PISA 2000 results

		Institutional differentiation		Realised educational differentiation at the school level											
				Variation in the type of programme in which the student is enrolled				Variation in student performance in reading literacy			Variation in socio-economic status[2,4]				
		First age of selection[1]	Number of programmes available to 15-year-olds[1]	Percentage of PISA students in general (ISCED 2A and ISCED 3A) programmes[2] (%)	S.E.	Performance (dis)advantage for students in vocational programmes[3]	S.E.	Between-school variance	S.E.	Between-school variance as a percentage of total variation within the country[5]	Between-school variance	S.E.	Between-school variance as a percentage of total variance within the country[5]	Standard deviation in grade levels	S.E.
OECD COUNTRIES	Australia	a	1	76	m	**-28.65**	(2.8)	2 181	(232.6)	20.3	59.5	(5.7)	22.9	0.48	(0.01)
	Austria	<14	4	63	(1.4)	**-21.61**	(7.1)	6 600	(542.9)	60.1	60.0	(6.1)	29.4	0.60	(0.02)
	Belgium	<14	4	80	(1.3)	**-69.10**	(2.1)	7 033	(629.1)	60.0	75.0	(7.3)	27.5	0.62	(0.02)
	Canada	a	1	a	a	a	a	1 929	(94.9)	20.7	48.3	(2.1)	18.1	0.48	(0.01)
	Czech Republic	<14	5	85	(0.7)	**-23.38**	(3.9)	4 838	(471.1)	54.0	46.9	(4.5)	24.1	0.57	(0.01)
	Denmark	a	1	100	n	**-77.65**	(25.3)	1 496	(321.4)	15.7	46.6	(4.6)	18.6	0.29	(0.01)
	Finland	a	1	a	a	a	a	594	(136.0)	7.7	41.8	(4.9)	16.0	0.32	(0.01)
	France	14-15	m	m	m	m	m	m	m	m	m	m	m	m	m
	Germany	<14	4	96	(1.5)	-1.11	(10.2)	6 855	(752.7)	59.4	59.3	(5.8)	24.8	0.66	(0.01)
	Greece	14-15	2	76	(3.1)	-12.61	(8.5)	5 011	(522.3)	50.2	81.1	(9.4)	25.9	0.57	(0.03)
	Hungary	<14	3	74	(2.1)	**-11.59**	(3.0)	6 186	(535.4)	65.5	82.4	(8.7)	32.9	0.70	(0.02)
	Iceland	a	1	100	n	n	n	694	(148.3)	8.2	56.9	(7.5)	20.3	n	n
	Ireland	14-15	4	99	(0.3)	**-94.34**	(10.5)	1 571	(206.4)	18.0	37.8	(4.7)	15.8	0.83	(0.02)
	Italy	14-15	3	100	n	-10.78	(28.7)	4 754	(603.1)	54.5	63.1	(7.0)	25.1	0.54	(0.02)
	Japan	14-15	2	74	(1.3)	m	m	3 398	(455.0)	46.5	m	m	m	n	n
	Korea	14-15	3	68	(1.3)	**-26.74**	(6.8)	1 876	(205.0)	37.9	46.5	(5.6)	23.6	0.12	(0.01)
	Luxembourg	<14	m	m	m	m	m	m	m	m	m	m	m	m	m
	Mexico	<14	3	59	(1.9)	2.64	(3.2)	3 971	(315.0)	53.4	103.3	(10.9)	36.7	0.81	(0.02)
	New Zealand	a	1	100	n	a	a	1 872	(266.1)	16.1	43.6	(5.2)	16.1	0.34	(0.01)
	Norway	a	1	100	n	a	a	977	(158.6)	9.1	30.6	(3.5)	13.0	0.13	(0.01)
	Poland	14-15	3	42	(1.5)	-25.41	(13.4)	6 188	(614.4)	62.7	61.9	(7.9)	28.2	n	n
	Portugal	14-15	3	96	(0.5)	**-17.11**	(4.3)	3 489	(339.8)	37.3	62.8	(7.4)	25.1	0.98	(0.02)
	Spain	a	1	100	n	-5.28	(57.5)	1 515	(149.4)	21.2	76.1	(8.0)	29.2	0.51	(0.01)
	Sweden	a	1	100	n	a	a	748	(156.0)	8.8	39.3	(4.7)	15.3	0.16	(0.01)
	Switzerland	14-15	4	97	(0.8)	**-36.77**	(6.9)	4 000	(361.0)	41.0	57.2	(5.1)	22.0	0.62	(0.01)
	United Kingdom	a	1	100	n	a	a	2 905	(234.0)	29.0	50.5	(3.9)	20.4	0.50	n
	United States	a	1	100	n	a	a	3 275	(452.4)	29.6	50.3	(6.0)	21.0	0.59	(0.03)
	OECD average		*2.5*	*80*	*m*			*3 386*	*m*	*35.9*	*57.9*	*m*	*23.0*	*0.47*	*m*
PARTNER COUNTRIES	Albania	14-15	3	84	(1.6)	-6.00	(5.8)	3 934	(359.4)	40.0	67.5	(7.5)	19.0	0.62	(0.04)
	Argentina	14-15	3	100	n	a	a	5 652	(518.2)	49.8	121.3	(14.0)	38.8	0.74	(0.05)
	Brazil	a	1	100	n	a	a	3 630	(331.8)	46.8	103.1	(8.3)	37.2	0.87	(0.02)
	Bulgaria	14-15	5	66	(1.8)	**10.45**	(2.6)	6 439	(653.2)	57.7	58.3	(6.7)	26.6	0.47	(0.02)
	Chile	14-15	2	100	n	**-79.06**	(11.7)	5 016	(484.3)	55.8	97.1	(10.5)	40.1	0.76	(0.02)
	Hong Kong-China	a	1	93	m	**-16.76**	(3.5)	3 338	(390.3)	47.8	25.7	(3.2)	17.1	0.90	(0.02)
	Indonesia	a	1	100	n	a	a	2 079	(194.8)	44.2	82.4	(7.0)	27.9	0.93	(0.02)
	Israel	<14	3	73	(4.5)	**-14.66**	(3.6)	5 427	(598.0)	45.2	82.9	(9.3)	33.7	0.33	(0.02)
	Latvia	14-15	4	52	(2.7)	6.96	(3.3)	3 139	(387.3)	30.2	46.8	(5.7)	14.4	0.76	(0.03)
	Liechtenstein	<14	3	100	(0.3)	a	a	m	m	m	m	m	m	0.47	(0.02)
	FYR Macedonia	14-15	4	91	(0.5)	**-19.72**	(3.5)	3 914	(465.0)	44.5	57.0	(8.6)	20.2	0.52	(0.04)
	Peru	14-15	4	100	n	a	a	6 704	(670.6)	60.7	89.0	(9.3)	34.0	1.09	(0.02)
	Russian Federation	14-15	3	82	(1.3)	7.26	(3.8)	3 067	(300.1)	36.9	46.7	(4.4)	16.6	0.52	(0.01)
	Thailand	14-15	2	86	(2.3)	-9.49	(5.1)	1 927	(237.9)	31.7	72.3	(7.8)	30.3	0.56	(0.02)
	Average of countries participating in PISA		*2.6*	*82*	*m*			*3 642*	*m*	*39.0*	*63.0*	*m*	*24.5*	*0.54*	*m*
	Netherlands[6]	<14	4	38	(2.2)	**-65.26**	(2.7)	4 075	(574.5)	52.0	43.4	(6.4)	16.9	0.62	(0.02)

1. As reported by PISA National Project Managers.
2. Results are based on students' self-reports. ISCED 2A and ISCED 3A are considered to be general programmes, as these programmes are designed to prepare students for futher study. ISCED 2C and ISCED 3C are labelled "vocational" as these programmes are designed for direct entry into the labour market, without further training. ISCED 2B and ISCED 3B are labelled "vocational" as well, for these programmes are designed to prepare students for ISCED 3C and ISCED 5B programmes (non-university tertiary education, typically designed to enter a particular occupation) respectively. See also Box 4.2.
3. These are regression coefficients. Statistically significant differences are printed in bold. With regard to the interpretation of the programme labels "general" and "vocational", see note 2 and Box 4.2.
4. Based on highest parent occupational status (HISEI) for each student within the school.
5. This index is often referred to as the intra-class correlation (rho).
6. Response rate is too low to ensure comparability.

Table 4.2

One indicator of quality and two indicators of (in)equity

Mean student performance in reading literacy, standard deviation in student performance in reading literacy and correlation between parents' occupational status and student performance in reading literacy

		Mean student reading literacy performance	S.E.	Standard deviation in student reading literacy peformance	S.E.	Correlation between parents' occupational status[1] and student reading literacy performance	S.E.
OECD COUNTRIES	Australia	528	(3.5)	101.8	(1.6)	0.30	(0.02)
	Austria	507	(2.4)	93.0	(1.6)	0.32	(0.02)
	Belgium	507	(3.6)	107.0	(2.4)	0.35	(0.02)
	Canada	534	(1.6)	94.6	(1.1)	0.25	(0.01)
	Czech Republic	492	(2.4)	96.3	(1.9)	0.36	(0.01)
	Denmark	497	(2.4)	98.1	(1.8)	0.28	(0.02)
	Finland	546	(2.6)	89.4	(2.6)	0.21	(0.02)
	France	m	m	m	m	m	m
	Germany	484	(2.5)	111.2	(1.9)	0.38	(0.02)
	Greece	474	(5.0)	97.1	(2.7)	0.31	(0.02)
	Hungary	480	(4.0)	93.9	(2.1)	0.38	(0.02)
	Iceland	507	(1.5)	92.4	(1.4)	0.20	(0.01)
	Ireland	527	(3.2)	93.6	(1.7)	0.29	(0.02)
	Italy	487	(2.9)	91.4	(2.7)	0.27	(0.02)
	Japan	522	(5.2)	85.8	(3.0)	m	m
	Korea	525	(2.4)	69.5	(1.6)	0.17	(0.02)
	Luxembourg	m	m	m	m	m	m
	Mexico	422	(3.3)	85.9	(2.1)	0.36	(0.03)
	New Zealand	529	(2.8)	108.2	(2.0)	0.30	(0.02)
	Norway	505	(2.8)	103.6	(1.7)	0.25	(0.02)
	Poland	479	(4.5)	99.8	(3.1)	0.33	(0.02)
	Portugal	470	(4.5)	97.1	(1.8)	0.37	(0.02)
	Spain	493	(2.7)	84.7	(1.2)	0.30	(0.02)
	Sweden	516	(2.2)	92.2	(1.2)	0.28	(0.02)
	Switzerland	494	(4.3)	102.0	(2.0)	0.38	(0.02)
	United Kingdom	523	(2.6)	100.5	(1.5)	0.36	(0.01)
	United States	504	(7.1)	104.8	(2.7)	0.32	(0.02)
	OECD average	500	m	100.0	m	0.31	m
PARTNER COUNTRIES	Albania	349	(3.3)	99.4	(1.9)	0.32	(0.02)
	Argentina	418	(9.9)	108.6	(3.4)	0.37	(0.02)
	Brazil	396	(3.1)	86.2	(1.9)	0.29	(0.02)
	Bulgaria	430	(4.9)	101.6	(3.0)	0.35	(0.03)
	Chile	410	(3.6)	89.9	(1.7)	0.39	(0.02)
	Hong Kong-China	525	(2.9)	84	(2.4)	0.18	(0.03)
	Indonesia	371	(4.0)	72.4	(2.5)	0.29	(0.03)
	Israel	452	(8.5)	109.1	(4.0)	0.32	(0.02)
	Latvia	458	(5.3)	102.2	(2.3)	0.24	(0.02)
	Liechtenstein	483	(4.1)	96.3	(3.9)	0.30	(0.05)
	FYR Macedonia	373	(1.9)	93.6	(1.2)	0.34	(0.02)
	Peru	327	(4.4)	96.1	(2.2)	0.34	(0.02)
	Russian Federation	462	(4.2)	92	(1.8)	0.28	(0.02)
	Thailand	431	(3.2)	76.6	(1.7)	0.23	(0.03)
	Average of countries participating in PISA	*473*	*m*	*95.0*	*m*	*0.31*	*m*
	Netherlands[2]	532	(3.4)	88.9	(2.7)	0.32	(0.02)

1. Results based on students' self-reports.
2. Response rate is too low to ensure comparability.

Table 4.3
Correlations between the indicators of quality and (in)equity

	Mean student performance in reading literacy	Standard deviation in student performance in reading literacy	Correlation between parents' occupational status[1] and student performance in reading literacy
Mean student performance in reading literacy	1.00	-0.06	**-0.58**
Standard deviation in student performance in reading literacy	0.09	1.00	**0.51**
Correlation between parents' occupational status[1] and student performance in reading literacy	**-0.36**	**0.48**	1.00

OECD countries
All PISA countries

Significant correlations at the 0.05 level (two-tailed) are printed in bold.
1. Results based on students' self-reports.

Table 4.4
Correlations between indicators of institutional differentiation and realised educational differentiation

	First age of selection[1]	Number of programmes available to 15-year-olds[1]	Percentage of PISA students in general programmes[2] (%)	Between-school variance in student performance in reading literacy	Between-school variance in socio-economic status[2,3]	Standard deviation in grade levels[2]
First age of selection[1]	1.00	**-0.90**	**0.55**	**-0.83**	**-0.66**	**-0.48**
Number of programmes available to 15-year-olds[1]	**-0.87**	1.00	**-0.39**	**0.72**	**0.45**	**0.49**
Percentage of PISA students in general programmes[2] (%)	**0.48**	**-0.44**	1.00	**-0.64**	**-0.67**	0.09
Between-school variance in student reading literacy performance	**-0.68**	**0.60**	**-0.43**	1.00	**0.80**	0.34
Between-school variance in socio-economic status[2,3]	**-0.42**	0.19	-0.16	**0.67**	1.00	**0.41**
Standard deviation in grade levels[2]	-0.21	0.28	0.18	**0.40**	**0.38**	1.00

OECD countries
All PISA countries

Significant correlations at the 0.05 level (two-tailed) are printed in bold.
1. As reported by PISA National Project Managers.
2. Results based on students' self-reports.
3. Based on highest parent occupational status (HISEI) for each student within the school.

Table 4.5
Correlations between indicators of institutional differentiation and realised educational differentiation and indicators of quality and (in)equity

	Mean student performance in reading literacy		Standard deviation in student performance in reading literacy		Correlation between parents' occupational status[2] and student performance in reading literacy	
	OECD countries	All countries	OECD countries	All countries	OECD countries	All countries
First age of selection[1]	**0.59**	0.21	0.00	-0.20	**-0.59**	**-0.51**
Number of programmes available to 15-year-olds[1]	**-0.43**	-0.30	0.03	0.25	**0.53**	**0.48**
Percentage of PISA students in general programmes[2] (%)	**0.38**	0.09	0.25	0.00	-0.21	-0.06
Between-school variance in student performance in reading literacy	**-0.49**	**-0.43**	0.02	0.02	**0.59**	**0.53**
Between-school variance in socio-economic status[2,3]	**-0.65**	**-0.51**	-0.23	-0.13	**0.49**	**0.49**
Standard deviation in grade levels[2]	**-0.43**	**-0.50**	0.22	-0.04	**0.69**	**0.39**

Significant correlations at the 0.05 level (two-tailed) are printed in bold.
1. As reported by PISA National Project Managers.
2. Results based on students' self-reports.
3. Based on highest parent occupational status (HISEI) for each student within the school.

Table 4.6a
Indicators of equity and quality for education systems in OECD countries with no selection, selection at the age of 14 or 15 and selection before the age of 14

	No selection	Selection at the age of 14 or 15	Selection before the age of 14	Correlation between age of selection and equity or quality indicator
Equity				
School level				
Proportion of between-school variance in student performance in reading literacy	0.17	0.44	0.55	-0.83
Proportion of between-school variance in average school socio-economic status	0.19	0.24	0.28	-0.66
Average standard deviation in grade levels	0.35	0.48	0.67	-0.48
Overall				
Correlation between student socio-economic background and student performance in reading literacy	0.28	0.30	0.36	-0.59
Standard deviation in student performance in reading literacy	97.3	92.0	98.3	0.00
Quality				
Mean student performance in reading literacy	517	498	476	0.59

Not statistically significantly correlated.

Table 4.6b
Indicators of equity and quality for education systems in all PISA countries with no selection, selection at the age of 14 or 15 and selection before the age of 14

	No selection	Selection at the age of 14 or 15	Selection before the age of 14	Correlation between age of selection and equity or quality indicator
Equity				
School level				
Proportion of between-school variance in student performance in reading literacy	0.23	0.45	0.54	-0.68
Proportion of between-school variance in average school socio-economic status	0.21	0.25	0.29	-0.42
Average standard deviation in grade levels	0.46	0.58	0.61	-0.21
Overall				
Correlation between student socio-economic background and student performance in reading literacy	0.27	0.31	0.35	-0.51
Standard deviation in student performance in reading literacy	93.8	93.8	99.2	-0.20
Quality				
Mean student performance in reading literacy	498	452	474	0.21

Not statistically significantly correlated.

Table 5.1

Responsibility at the school level for personnel management, financial resources, student policies, and curriculum and instruction on average in OECD countries

Distribution of percentage of students enrolled in schools where the principals report that the school board, principal, department head or teachers have some responsibility in the four domains of decision making[1]

	School board		Principal		Department head		Teachers	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.
Personnel management								
Appointing teachers	22.2	(0.5)	38.1	(0.5)	2.9	(0.2)	0.2	(0.1)
Dismissing teachers	24.4	(0.5)	28.0	(0.6)	2.6	(0.2)	0.1	(0.0)
Establishing teachers' starting salaries	9.5	(0.4)	11.2	(0.4)	3.2	(0.2)	0.1	(0.1)
Determining teachers' salary increases	11.2	(0.5)	12.2	(0.4)	3.2	(0.2)	0.1	(0.0)
Financial resources								
Formulating the school budget	35.1	(0.7)	38.1	(0.7)	2.0	(0.2)	0.3	(0.1)
Deciding on budget allocations within the school	32.5	(0.6)	59.8	(0.6)	2.4	(0.2)	0.8	(0.1)
Student policies								
Establishing student disciplinary policies	37.0	(0.6)	45.3	(0.6)	5.6	(0.4)	6.4	(0.4)
Establishing student assesment policies	17.6	(0.6)	41.1	(0.7)	16.3	(0.6)	14.1	(0.5)
Approving students for admittance to school	18.6	(0.6)	62.2	(0.7)	2.5	(0.3)	0.8	(0.2)
Curriculum and instruction								
Choosing which textbooks are used	10.7	(0.5)	16.5	(0.5)	32.8	(0.6)	31.5	(0.6)
Determining course content	7.0	(0.4)	16.8	(0.5)	24.1	(0.6)	20.5	(0.5)
Deciding which courses are offered	18.6	(0.7)	38.7	(0.7)	10.4	(0.4)	4.6	(0.4)

1. Italy, Norway and Poland are excluded due to missing or unreliable data, and the Netherlands due to the response rate, which is too low to ensure comparability.

Table 5.2

Responsibility at the school level for personnel management

Distribution of percentages of students enrolled in schools where principals report that the school board, school principal, department head or teachers have some responsibility for personnel management

		School board		School principal		Department head		Teachers		Total at school level	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD COUNTRIES	Australia	5.1	(1.0)	30.0	(1.7)	0.5	(0.3)	0.2	(0.2)	35.8	(1.4)
	Austria	0.1	(0.1)	4.6	(1.1)	0.2	(0.2)	0.0	(0.0)	5.0	(1.2)
	Belgium	25.1	(1.6)	25.8	(1.3)	0.0	(0.0)	0.0	(0.0)	50.9	(1.0)
	Canada	29.0	(1.3)	22.7	(0.7)	0.9	(0.2)	0.0	(0.0)	52.6	(1.3)
	Czech Republic	3.9	(1.1)	79.9	(2.2)	0.0	(0.0)	0.0	(0.0)	83.8	(1.8)
	Denmark	24.7	(1.3)	19.5	(1.6)	0.2	(0.2)	0.0	(0.0)	44.4	(1.5)
	Finland	7.3	(1.2)	7.4	(1.3)	0.0	(0.0)	0.1	(0.1)	14.7	(1.7)
	France	m	m	m	m	m	m	m	m	m	m
	Germany	1.0	(0.4)	4.3	(1.0)	0.0	(0.0)	0.0	(0.0)	5.4	(1.1)
	Greece	6.6	(1.9)	1.6	(0.7)	62.0	(4.2)	0.1	(0.1)	70.3	(3.9)
	Hungary	9.5	(1.7)	62.9	(2.4)	0.0	(0.0)	0.0	(0.0)	72.5	(2.1)
	Iceland	7.0	(0.1)	45.4	(0.1)	0.0	(0.0)	0.0	(0.0)	52.3	(0.1)
	Ireland	35.7	(2.0)	6.9	(1.3)	0.0	(0.0)	0.0	(0.0)	42.7	(1.6)
	Italy	m	m	m	m	m	m	m	m	m	m
	Japan	27.1	(2.7)	5.5	(1.8)	0.0	(0.0)	0.0	(0.0)	32.6	(1.9)
	Korea	1.8	(0.8)	16.6	(2.0)	0.0	(0.0)	0.6	(0.5)	19.0	(2.4)
	Luxembourg	m	m	m	m	m	m	m	m	m	m
	Mexico	16.5	(2.3)	18.5	(2.0)	3.8	(1.1)	0.0	(0.0)	38.8	(2.8)
	New Zealand	31.9	(1.5)	31.9	(2.0)	0.0	(0.0)	0.0	(0.0)	63.8	(1.2)
	Norway	m	m	m	m	m	m	m	m	m	m
	Poland	m	m	m	m	m	m	m	m	m	m
	Portugal	1.4	(0.7)	3.2	(0.5)	0.0	(0.0)	0.0	(0.0)	4.6	(0.6)
	Spain	7.3	(1.1)	15.6	(2.2)	0.0	(0.0)	0.6	(0.6)	23.4	(1.7)
	Sweden	8.5	(1.6)	70.3	(2.2)	0.0	(0.0)	0.4	(0.4)	79.2	(2.0)
	Switzerland	39.0	(1.9)	11.3	(1.5)	0.0	(0.0)	0.0	(0.0)	50.3	(1.8)
	United Kingdom	59.2	(2.2)	21.4	(2.1)	2.0	(0.8)	0.0	(0.0)	82.6	(1.4)
	United States	66.0	(3.6)	20.1	(2.1)	0.0	(0.0)	0.5	(0.3)	86.5	(2.6)
	OECD average	*16.8*	*(0.4)*	*22.4*	*(0.3)*	*2.9*	*(0.2)*	*0.1*	*(0.0)*	*42.2*	*(0.4)*
PARTNER COUNTRIES	Albania	3.7	(0.9)	4.9	(1.0)	0.1	(0.0)	0.0	(0.0)	8.7	(1.7)
	Argentina	6.2	(1.8)	13.2	(3.9)	0.0	(0.0)	0.0	(0.0)	19.4	(4.3)
	Brazil	5.9	(1.1)	14.6	(1.6)	2.3	(0.7)	0.0	(0.0)	22.8	(1.7)
	Bulgaria	5.7	(1.6)	51.1	(1.7)	0.0	(0.0)	0.0	(0.0)	56.7	(2.3)
	Chile	13.6	(1.7)	16.5	(1.7)	8.2	(1.4)	0.0	(0.0)	38.3	(1.8)
	Hong Kong-China	13.0	(1.8)	40.0	(2.0)	0.0	(0.0)	0.0	(0.0)	53.0	(1.5)
	Indonesia	24.0	(3.0)	34.1	(3.2)	8.4	(1.7)	0.4	(0.2)	66.9	(4.4)
	Israel	8.5	(3.0)	53.9	(3.0)	1.9	(1.2)	0.0	(0.0)	64.3	(2.8)
	Latvia	4.1	(1.1)	57.5	(1.5)	2.0	(0.9)	0.6	(0.3)	64.2	(2.0)
	Liechtenstein	m	m	m	m	m	m	m	m	m	m
	FYR Macedonia	17.4	(0.3)	41.0	(0.3)	0.0	(0.0)	0.0	(0.0)	58.4	(0.5)
	Peru	3.9	(1.4)	25.9	(2.0)	3.1	(0.9)	0.0	(0.0)	32.8	(2.1)
	Russian Federation	3.8	(0.8)	48.4	(1.7)	18.9	(1.8)	0.3	(0.2)	71.4	(1.7)
	Thailand	18.0	(1.8)	29.8	(2.1)	1.1	(0.7)	0.3	(0.2)	49.1	(2.0)
	Average of countries participating in PISA	*14.2*	*(0.3)*	*25.3*	*(0.3)*	*3.1*	*(0.2)*	*0.1*	*n*	*42.7*	*(0.3)*
	Netherlands[1]	30.4	(3.5)	48.0	(3.2)	0.0	(0.0)	0.8	(0.8)	79.2	(2.3)

1. Response rate too low to ensure comparability.

Table 5.3

Responsibility at the school level for financial resources

Distribution of percentages of students enrolled in schools where principals report that the school board, school principal, department head or teachers have some responsibility for financial resources

		School board		School principal		Department head		Teachers		Total at school level	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD COUNTRIES	Australia	29.9	(3.4)	66.3	(3.1)	1.4	(0.9)	0.1	(0.1)	97.6	(0.8)
	Austria	9.1	(1.8)	41.4	(2.6)	0.4	(0.4)	1.9	(0.7)	52.9	(1.8)
	Belgium	49.2	(2.9)	48.8	(2.9)	0.4	(0.3)	0.0	(0.0)	98.5	(0.6)
	Canada	28.2	(1.3)	56.7	(1.4)	2.8	(0.6)	0.3	(0.1)	88.0	(0.8)
	Czech Republic	16.3	(2.3)	74.5	(2.7)	0.4	(0.2)	0.0	(0.0)	91.2	(1.4)
	Denmark	38.7	(2.5)	41.9	(2.6)	12.6	(2.2)	0.4	(0.3)	93.6	(1.1)
	Finland	15.2	(2.3)	62.1	(2.8)	0.0	(0.0)	0.4	(0.4)	77.6	(2.1)
	France	m	m	m	m	m	m	m	m	m	m
	Germany	32.5	(1.7)	18.0	(1.9)	1.0	(0.6)	2.4	(0.8)	53.9	(1.2)
	Greece	55.6	(3.8)	30.4	(3.4)	4.3	(1.4)	0.1	(0.1)	90.3	(2.4)
	Hungary	21.4	(2.8)	54.4	(3.2)	0.4	(0.4)	0.0	(0.0)	76.2	(2.7)
	Iceland	19.4	(0.1)	61.4	(0.2)	0.0	(0.0)	0.0	(0.0)	80.8	(0.1)
	Ireland	42.0	(3.3)	46.5	(3.3)	0.6	(0.4)	0.5	(0.5)	89.6	(1.6)
	Italy	m	m	m	m	m	m	m	m	m	m
	Japan	17.1	(2.5)	52.0	(3.2)	0.8	(0.6)	0.7	(0.5)	70.6	(2.5)
	Korea	8.2	(2.5)	68.4	(3.7)	11.4	(2.1)	3.4	(1.6)	91.3	(1.8)
	Luxembourg	m	m	m	m	m	m	m	m	m	m
	Mexico	29.7	(3.4)	40.9	(3.9)	1.2	(0.7)	0.1	(0.0)	72.0	(3.6)
	New Zealand	59.5	(2.8)	38.7	(2.9)	0.7	(0.5)	0.0	(0.0)	98.9	(0.6)
	Norway	m	m	m	m	m	m	m	m	m	m
	Poland	m	m	m	m	m	m	m	m	m	m
	Portugal	84.7	(2.2)	6.6	(0.9)	0.0	(0.0)	0.0	(0.0)	91.4	(2.0)
	Spain	64.6	(3.8)	27.5	(3.6)	1.5	(0.6)	0.3	(0.3)	93.9	(1.7)
	Sweden	12.3	(2.2)	79.9	(2.5)	0.0	(0.0)	0.0	(0.0)	92.2	(1.6)
	Switzerland	39.9	(3.1)	25.7	(2.4)	2.8	(1.0)	2.1	(0.9)	70.6	(2.6)
	United Kingdom	50.7	(2.8)	35.9	(2.7)	9.3	(1.9)	0.0	(0.0)	96.0	(0.4)
	United States	53.2	(4.6)	43.1	(4.1)	0.5	(0.4)	0.5	(0.4)	97.3	(1.4)
	OECD average	*33.8*	*(0.5)*	*48.9*	*(0.6)*	*2.2*	*(0.2)*	*0.6*	*(0.1)*	*85.5*	*(0.4)*
PARTNER COUNTRIES	Albania	16.8	(1.9)	17.0	(2.0)	0.0	(0.0)	0.0	(0.0)	33.8	(2.6)
	Argentina	27.2	(6.1)	12.5	(2.7)	0.0	(0.0)	0.0	(0.0)	39.7	(5.8)
	Brazil	50.3	(3.2)	14.0	(2.2)	0.5	(0.3)	0.0	(0.0)	64.8	(2.6)
	Bulgaria	6.9	(1.9)	41.2	(3.8)	0.0	(0.0)	0.0	(0.0)	48.1	(3.6)
	Chile	33.3	(3.2)	21.0	(2.5)	9.1	(2.0)	0.0	(0.0)	63.3	(3.0)
	Hong Kong-China	48.3	(3.8)	45.7	(3.8)	1.1	(0.8)	0.7	(0.5)	95.8	(1.5)
	Indonesia	39.0	(4.2)	49.9	(3.7)	6.8	(2.2)	1.4	(1.1)	97.1	(1.0)
	Israel	24.4	(4.5)	61.0	(5.1)	1.1	(0.7)	0.6	(0.6)	87.0	(3.5)
	Latvia	22.5	(2.9)	35.3	(3.3)	2.4	(1.2)	0.9	(0.5)	61.2	(3.1)
	Liechtenstein	m	m	m	m	m	m	m	m	m	m
	FYR Macedonia	41.9	(0.8)	23.1	(0.5)	0.0	(0.0)	0.2	(0.0)	65.2	(0.5)
	Peru	7.7	(1.9)	61.8	(3.7)	3.5	(1.6)	0.8	(0.5)	73.8	(3.6)
	Russian Federation	19.5	(2.6)	23.2	(3.3)	15.8	(2.0)	0.0	(0.0)	58.5	(3.6)
	Thailand	49.9	(4.3)	27.3	(3.9)	3.0	(1.0)	2.7	(1.3)	82.9	(1.9)
	Average of countries participating in PISA	*31.7*	*(0.5)*	*43.1*	*(0.4)*	*2.6*	*(0.2)*	*1.0*	*(0.1)*	*78.3*	*(0.4)*
	Netherlands[1]	16.5	(2.9)	82.9	(2.9)	0.6	(0.6)	0.0	(0.0)	100.0	(0.0)

1. Response rate too low to ensure comparability.

Table 5.4

Responsibility at the school level for student policies

Distribution of percentages of students enrolled in schools where principals report that the school board, school principal, department head or teachers have some responsibility for student policies

		School board		School principal		Department head		Teachers		Total at school level	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD COUNTRIES	Australia	9.9	(1.7)	72.7	(2.3)	10.3	(1.6)	4.4	(1.5)	97.3	(0.6)
	Austria	22.3	(1.8)	38.8	(2.2)	6.4	(1.0)	12.2	(1.7)	79.7	(2.0)
	Belgium	21.5	(2.1)	72.0	(2.4)	2.6	(0.8)	1.5	(0.6)	97.6	(0.7)
	Canada	24.4	(1.2)	60.1	(1.4)	7.4	(0.8)	2.0	(0.3)	93.9	(0.5)
	Czech Republic	20.4	(2.7)	68.1	(2.8)	3.3	(0.8)	4.3	(1.0)	96.2	(0.6)
	Denmark	41.2	(1.8)	45.2	(2.1)	1.0	(0.4)	3.5	(0.8)	90.9	(1.4)
	Finland	11.4	(1.7)	53.4	(2.7)	0.7	(0.4)	14.0	(1.9)	79.5	(1.9)
	France	m	m	m	m	m	m	m	m	m	m
	Germany	31.8	(1.5)	34.7	(1.7)	4.9	(0.9)	13.3	(1.5)	84.6	(1.8)
	Greece	6.7	(1.6)	44.6	(3.0)	33.3	(2.5)	8.4	(1.9)	92.9	(1.4)
	Hungary	46.2	(2.9)	41.7	(2.6)	8.4	(1.5)	2.7	(0.9)	98.9	(0.4)
	Iceland	5.5	(0.0)	78.9	(0.1)	0.0	(0.0)	5.7	(0.1)	90.1	(0.1)
	Ireland	22.0	(2.5)	63.4	(3.2)	0.6	(0.4)	11.7	(1.9)	97.7	(0.8)
	Italy	m	m	m	m	m	m	m	m	m	m
	Japan	0.0	(0.0)	86.8	(2.1)	9.5	(1.8)	3.6	(1.1)	99.9	(0.1)
	Korea	1.3	(0.8)	63.0	(2.7)	24.3	(2.8)	9.9	(2.0)	98.4	(0.5)
	Luxembourg	m	m	m	m	m	m	m	m	m	m
	Mexico	19.0	(2.2)	50.0	(2.5)	13.8	(1.8)	9.5	(1.4)	92.3	(1.0)
	New Zealand	32.4	(2.4)	61.4	(2.3)	3.3	(0.8)	1.0	(0.7)	98.1	(0.4)
	Norway	m	m	m	m	m	m	m	m	m	m
	Poland	m	m	m	m	m	m	m	m	m	m
	Portugal	57.4	(2.3)	5.3	(1.1)	6.7	(1.2)	18.5	(1.8)	87.8	(2.1)
	Spain	56.1	(1.8)	16.4	(2.0)	7.1	(1.1)	15.4	(1.8)	95.1	(1.1)
	Sweden	5.0	(1.2)	52.2	(2.5)	20.5	(2.0)	3.8	(1.2)	81.6	(1.6)
	Switzerland	33.7	(2.2)	28.6	(2.4)	4.6	(0.8)	17.5	(2.0)	84.5	(2.0)
	United Kingdom	28.4	(2.4)	40.8	(2.4)	19.0	(2.5)	0.3	(0.2)	88.5	(1.2)
	United States	56.5	(4.5)	35.0	(4.0)	1.1	(0.6)	1.4	(0.7)	94.0	(1.3)
	OECD average	*24.5*	*(0.5)*	*49.5*	*(0.5)*	*8.0*	*(0.3)*	*7.1*	*(0.3)*	*89.1*	*(0.2)*
PARTNER COUNTRIES	Albania	14.1	(1.8)	44.4	(2.1)	2.2	(0.5)	14.4	(1.1)	75.1	(2.4)
	Argentina	11.7	(2.3)	67.1	(4.0)	3.0	(0.9)	2.9	(0.8)	84.8	(2.7)
	Brazil	49.3	(2.4)	29.1	(2.3)	8.2	(1.5)	2.4	(0.6)	89.0	(1.4)
	Bulgaria	37.6	(3.4)	34.1	(3.9)	2.1	(0.8)	14.7	(2.1)	88.4	(2.0)
	Chile	58.5	(3.1)	24.2	(2.6)	7.2	(1.4)	7.1	(1.4)	97.1	(1.0)
	Hong Kong-China	64.1	(3.8)	18.7	(3.0)	10.7	(1.5)	5.6	(1.2)	99.1	(0.4)
	Indonesia	18.6	(2.5)	49.9	(3.3)	8.4	(1.8)	22.9	(2.0)	99.9	(0.1)
	Israel	38.1	(6.0)	46.1	(4.9)	4.4	(1.6)	7.8	(2.1)	96.5	(1.0)
	Latvia	17.8	(2.9)	41.8	(2.3)	8.3	(1.9)	24.0	(2.6)	91.8	(1.8)
	Liechtenstein	m	m	m	m	m	m	m	m	m	m
	FYR Macedonia	23.3	(0.7)	24.1	(0.3)	13.2	(0.4)	37.4	(0.3)	98.0	(0.0)
	Peru	10.1	(1.7)	70.8	(2.7)	7.7	(1.4)	9.4	(1.5)	98.0	(0.7)
	Russian Federation	34.4	(1.8)	15.7	(1.1)	44.9	(1.8)	4.6	(0.7)	99.6	(0.2)
	Thailand	56.4	(3.3)	27.0	(3.0)	5.7	(1.5)	8.1	(1.6)	97.2	(0.8)
	Average of countries participating in PISA	*27.2*	*(0.4)*	*44.5*	*(0.4)*	*9.0*	*(0.2)*	*9.0*	*(0.2)*	*89.8*	*(0.2)*
	Netherlands[1]	3.6	(1.5)	80.0	(3.3)	14.1	(2.9)	2.4	(1.7)	100.0	(0.0)

1. Response rate too low to ensure comparability.

Table 5.5

Responsibility at the school level for curriculum and instruction

Distribution of percentages of students enrolled in schools where principals report that the school board, school principal, department head or teachers have some responsibility for curriculum and instruction

		School board		School principal		Department head		Teachers		Total at school level	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD COUNTRIES	Australia	6.6	(1.4)	30.4	(1.8)	51.4	(2.2)	4.9	(1.1)	93.3	(1.4)
	Austria	26.8	(2.4)	10.4	(1.4)	11.6	(1.7)	20.2	(2.2)	69.1	(2.1)
	Belgium	12.4	(1.4)	27.9	(2.1)	3.9	(0.8)	27.8	(1.6)	71.9	(2.3)
	Canada	13.4	(0.9)	34.7	(1.1)	19.5	(1.0)	8.3	(0.7)	75.8	(0.9)
	Czech Republic	8.1	(1.7)	50.2	(2.4)	24.6	(1.8)	4.9	(1.0)	87.8	(1.8)
	Denmark	45.3	(2.7)	24.5	(2.1)	2.5	(0.8)	16.5	(1.7)	88.8	(1.2)
	Finland	8.7	(1.6)	39.0	(2.4)	9.7	(1.7)	37.9	(2.7)	95.4	(1.2)
	France	m	m	m	m	m	m	m	m	m	m
	Germany	22.5	(2.3)	9.5	(1.3)	14.7	(1.6)	8.3	(1.3)	55.0	(2.2)
	Greece	0.7	(0.5)	2.4	(1.6)	87.1	(3.0)	0.0	(0.0)	90.2	(2.7)
	Hungary	22.2	(2.4)	30.9	(2.5)	36.9	(2.0)	8.4	(1.6)	98.3	(0.7)
	Iceland	8.7	(0.1)	39.6	(0.1)	11.2	(0.1)	19.9	(0.1)	79.4	(0.1)
	Ireland	10.4	(1.4)	24.8	(2.0)	1.3	(0.7)	41.5	(2.0)	78.1	(1.5)
	Italy	m	m	m	m	m	m	m	m	m	m
	Japan	0.5	(0.3)	64.1	(3.5)	23.4	(3.0)	10.8	(1.8)	98.8	(0.6)
	Korea	2.2	(0.9)	29.2	(2.5)	8.5	(1.8)	57.4	(2.3)	97.3	(0.9)
	Luxembourg	m	m	m	m	m	m	m	m	m	m
	Mexico	9.3	(1.7)	16.2	(2.2)	21.9	(2.7)	18.1	(2.0)	65.5	(2.7)
	New Zealand	7.0	(1.0)	30.8	(1.4)	57.3	(1.4)	0.6	(0.6)	95.7	(0.9)
	Norway	m	m	m	m	m	m	m	m	m	m
	Poland	m	m	m	m	m	m	m	m	m	m
	Portugal	16.4	(1.6)	1.5	(0.4)	13.5	(1.9)	24.3	(2.0)	55.7	(2.0)
	Spain	11.1	(1.3)	18.2	(1.8)	26.5	(2.3)	24.3	(2.8)	80.0	(1.8)
	Sweden	1.6	(0.7)	20.6	(2.3)	51.0	(2.8)	14.3	(2.4)	87.6	(2.0)
	Switzerland	9.0	(1.4)	6.9	(1.5)	9.4	(1.6)	12.2	(1.6)	37.5	(2.8)
	United Kingdom	5.4	(1.1)	23.6	(2.1)	27.9	(2.2)	40.9	(2.3)	97.8	(0.5)
	United States	40.2	(4.7)	26.3	(3.0)	15.3	(3.0)	9.6	(2.4)	91.4	(2.1)
	OECD average	*12.1*	*(0.4)*	*24.1*	*(0.4)*	*22.4*	*(0.4)*	*18.8*	*(0.4)*	*77.4*	*(0.4)*
PARTNER COUNTRIES	Albania	4.1	(1.0)	4.6	(1.5)	2.3	(0.5)	2.5	(0.6)	13.5	(1.8)
	Argentina	5.8	(1.3)	47.6	(4.3)	12.2	(2.1)	16.3	(2.3)	81.9	(3.2)
	Brazil	16.2	(1.5)	20.2	(2.2)	24.6	(2.4)	21.3	(2.4)	82.3	(1.5)
	Bulgaria	24.4	(2.7)	16.9	(4.2)	2.2	(0.6)	28.6	(2.6)	72.2	(2.3)
	Chile	33.5	(2.5)	12.9	(2.1)	13.4	(1.8)	30.2	(2.6)	90.1	(1.9)
	Hong Kong-China	41.2	(3.4)	16.4	(2.2)	39.5	(2.4)	1.9	(1.3)	99.1	(0.5)
	Indonesia	11.1	(2.1)	43.5	(2.8)	12.2	(1.7)	24.8	(2.2)	91.6	(1.4)
	Israel	20.3	(5.0)	37.1	(4.9)	25.8	(3.2)	8.0	(1.9)	91.2	(2.2)
	Latvia	12.4	(3.2)	10.7	(2.2)	11.0	(1.8)	54.5	(3.3)	88.6	(1.9)
	Liechtenstein	m	m	m	m	m	m	m	m	m	m
	FYR Macedonia	6.3	(0.3)	6.8	(0.1)	4.8	(0.1)	21.6	(0.4)	39.5	(0.7)
	Peru	4.3	(1.1)	29.3	(2.7)	8.0	(1.5)	34.7	(2.6)	76.3	(2.6)
	Russian Federation	23.0	(2.1)	0.7	(0.5)	30.3	(1.9)	41.7	(1.5)	95.8	(0.9)
	Thailand	32.8	(3.4)	4.7	(1.6)	23.1	(2.5)	35.5	(3.0)	96.1	(1.0)
	Average of countries participating in PISA	*14.1*	*(0.3)*	*21.8*	*(0.4)*	*19.8*	*(0.3)*	*20.2*	*(0.3)*	*75.9*	*(0.3)*
	Netherlands[1]	4.9	(1.3)	38.5	(3.4)	27.4	(3.2)	25.0	(3.6)	95.8	(1.7)

1. Response rate too low to ensure comparability.

Table 5.6
Effects of school and teacher autonomy on student performance in reading literacy

	Model 1 - Gross, unadjusted effects				Model 2 - Net effects, adjusted for student characteristics, school context and policy-amenable school characteristics			
	All PISA countries		OECD countries		All PISA countries		OECD countries	
	Effect	S.E.	Effect	S.E.	Effect	S.E.	Effect	S.E.
Constant	**465**	(9.27)	**496**	(5.82)	**471**	(8.19)	**498**	(6.98)
School autonomy index	**8.7**	(2.62)	**6.7**	(2.24)	**-2.0**	(0.56)	**-1.8**	(0.63)
Teacher autonomy index	-2.4	(1.58)	-2.1	(2.10)	0.4	(0.43)	0.5	(0.49)
Student characteristics								
Grade level (deviation from country mode)					**25.8**	(0.22)	**30.3**	(0.31)
Age					**-1.9**	(0.16)	**-1.9**	(0.20)
In vocational programme (ISCED 2B, 2C, 3B or 3C)					**-18.7**	(0.76)	**-29.2**	(1.00)
Parents' occupational status (HISEI)					**13.3**	(0.17)	**15.1**	(0.21)
Female student					**22.4**	(0.32)	**24.3**	(0.39)
Immigrant					**-22.1**	(0.81)	**-31.7**	(0.96)
School context								
School average parents' occupational status (HISEI)					**24.6**	(0.55)	**24.0**	(0.64)
School type (reference category: public schools)								
Independent private schools					**-6.9**	(2.16)	**-13.9**	(2.79)
Government-dependent private schools					**5.3**	(1.19)	**4.3**	(2.04)
School location (reference category: town 15 000 - 100 000 inhabitants)								
Village, less than 3 000 inhabitants					0.3	(1.57)	**6.5**	(1.83)
Small town, 3 000 - 15 000 inhabitants					0.9	(1.23)	**3.8**	(1.34)
City, 100 000 - 1 000 000 inhabitants					-0.9	(1.22)	**-3.0**	(1.41)
Large city, more than 1 000 000 inhabitants					-3.4	(1.86)	**-5.2**	(2.25)
School resources								
School size					**1.9**	(0.57)	**3.9**	(0.77)
Index of the quality of schools' physical infrastructure					**-1.5**	(0.49)	**-1.6**	(0.58)
Index of the quality of schools' educational resources					**2.7**	(0.53)	**1.7**	(0.62)
Proportion of computers available to 15-year-olds					-0.3	(0.46)	0.0	(0.57)
Proportion of language of assessment teachers with a third level qualification					**3.3**	(0.56)	**4.6**	(0.67)
Index of teacher shortage					0.6	(0.47)	1.0	(0.54)
Student-teaching staff ratio					0.6	(0.67)	-0.5	(0.94)
Professional development					-0.6	(0.44)	-0.6	(0.48)
School climate								
Index of disciplinary climate					**7.6**	(0.51)	**8.1**	(0.56)
Index of teacher support					**-3.1**	(0.61)	**-4.4**	(0.67)
Index of achievement press					0.3	(0.52)	-1.1	(0.59)
Index of teacher-student relations					**-2.2**	(0.59)	0.2	(0.70)
Index of students' sense of belonging at school					**7.9**	(0.52)	**5.2**	(0.59)
Index of principals' perceptions of teacher-related factors affecting school climate					**-4.2**	(0.58)	**-3.9**	(0.66)
Index of principals' perceptions of student-related factors affecting school climate					**9.0**	(0.57)	**9.6**	(0.66)
Index of principals' perceptions of teachers' morale and commitment					**1.9**	(0.45)	1.0	(0.51)
School policies								
Instructional time					1.0	(0.81)	0.7	(0.88)
Index of monitoring of student progress					1.1	(0.71)	0.1	(0.79)
Index of school self-evaluation					0.6	(0.72)	2.1	(0.83)
Student's performance is considered for school admission					**2.8**	(0.56)	**4.2**	(0.63)
Study programme for 15-year-olds is based on students' academic record					-0.2	(0.59)	0.5	(0.69)
Study programme for 15-year-olds is based on students' placement exams					0.8	(0.54)	0.2	(0.67)
Transfer of low achievers to another school: likely					**5.8**	(1.20)	**6.6**	(1.51)
very likely					**12.0**	(1.85)	**13.4**	(2.05)
Performance information is communicated to parents					0.9	(0.60)	1.1	(0.67)
Performance information is communicated to school principal					-0.4	(0.57)	-0.1	(0.61)
Performance information is communicated to local education authorities					-0.2	(0.45)	-0.3	(0.51)

Note: Values that are statistically significant at $p<0.01$ are indicated in bold. Averages exclude Italy, Japan, the Netherlands, Norway and Poland.
A regression coefficient indicates to what extent the score on the dependent variable (the reading literacy scores) tends to go up (or down, in the case of negative values) by an increase of one unit (*e.g.* a student is one month older than the average student age, or a school's score on one of the school climate, school resources or school policies indices is one point higher) on a specific independent variable, while all other variables are constant. In some cases the independent variables are not continuous but dichotomous (*e.g.* girls versus boys, independent private schools versus public schools). In those cases the regression coefficient indicates to what extent the score on the dependent variable tends to change if the student is a girl instead of a boy, or if the school is an independent private school instead of a public school. All explanatory variables with the exception of the dichotomous variables have been transformed into z-scores.

Table 5.7
Effects of school autonomy in the four domains of decision making on student performance in reading literacy

	Model 1 - Gross, unadjusted effects				Model 2 - Net effects, adjusted for student characteristics, school context and policy-amenable school characteristics			
	All PISA countries		OECD countries		All PISA countries		OECD countries	
	Effect	S.E.	Effect	S.E.	Effect	S.E.	Effect	S.E.
Constant	**465**	(9.37)	**496**	(5.86)	**469**	(8.77)	**498**	(8.50)
Personnel management	**10.3**	(2.96)	**10.9**	(3.28)	-1.7	(0.71)	**-1.8**	(0.50)
Financial resources	0.6	(1.18)	-0.8	(1.13)	0.3	(0.68)	0.6	(0.77)
Student policies	**-3.7**	(1.10)	-2.7	(1.29)	-0.7	(0.72)	-0.5	(0.87)
Curriculum and instruction	1.2	(1.43)	0.8	(1.93)	-0.3	(0.80)	-0.7	(1.13)
Student characteristics								
Grade level (deviation from country mode)					**27.1**	(2.41)	**32.1**	(2.83)
Age					**-2.2**	(0.49)	**-2.3**	(0.57)
In vocational programme (ISCED 2B, 2C, 3B or 3C)					**-18.6**	(6.26)	**-29.4**	(7.21)
Parents' occupational status (HISEI)					**13.6**	(1.17)	**15.5**	(1.26)
Female student					**22.8**	(2.14)	**24.7**	(2.33)
Immigrant					**-21.4**	(5.93)	**-31.0**	(2.72)
School context								
School average parents' occupational status (HISEI)					**24.2**	(1.97)	**23.5**	(2.34)
School type (reference category: public schools)								
Independent private schools					-6.7	(3.25)	**-13.0**	(3.99)
Government-dependent private schools					5.6	(3.22)	4.8	(3.57)
School location (reference category: town 15 000 - 100 000 inhabitants)								
Village, less than 3 000 inhabitants					0.0	(3.38)	**6.9**	(1.86)
Small town, 3 000 - 15 000 inhabitants					1.0	(1.82)	4.3	(1.49)
City, 100 000 - 1 000 000 inhabitants					-1.1	(1.76)	-3.5	(1.89)
Large city, more than 1,000,000 inhabitants					-3.4	(2.80)	-5.3	(3.16)
School resources								
School size					1.9	(1.25)	**4.0**	(1.10)
Index of the quality of schools' physical infrastructure					-1.5	(0.61)	**-1.7**	(0.62)
Index of the quality of schools' educational resources					**2.6**	(0.61)	**1.5**	(0.56)
Proportion of computers available to 15-year-olds					-0.5	(0.61)	-0.4	(0.75)
Proportion of teachers with an ISCED 5A qualification in the language of assessment					**3.6**	(1.33)	**5.2**	(1.42)
Index of teacher shortage					0.8	(0.64)	1.3	(0.62)
Student-teaching staff ratio					0.7	(1.44)	-0.1	(1.70)
Professional development					-0.6	(0.45)	-0.6	(0.40)
School climate								
Index of disciplinary climate					**7.3**	(1.07)	**7.8**	(0.93)
Index of teacher support					-2.7	(1.47)	**-4.0**	(1.51)
Index of achievement press					-0.3	(1.27)	-1.2	(1.29)
Index of teacher-student relations					-2.2	(1.24)	0.1	(0.98)
Index of students' sense of belonging at school					**7.8**	(1.56)	**4.9**	(1.25)
Index of principals' perceptions of teacher-related factors affecting school climate					**-4.4**	(0.82)	**-4.2**	(1.01)
Index of principals' perceptions of student-related factors affecting school climate					**8.7**	(1.09)	**9.1**	(1.37)
Index of principals' perceptions of teachers' morale and commitment					**2.0**	(0.64)	1.2	(0.56)
School policies								
Instructional time					0.8	(0.85)	0.7	(0.88)
Index of monitoring of student progress					1.2	(0.87)	0.3	(0.90)
Index of school self-evaluation					0.6	(1.19)	1.6	(1.38)
Student's performance is considered for school admission					2.7	(1.57)	4.1	(2.19)
Study programme for 15-year-olds is based on students' academic record					-0.1	(1.06)	0.5	(1.25)
Study programme for 15-year-olds is based on students' placement exams					0.5	(1.30)	-0.1	(1.48)
Transfer of low achievers to another school: likely					**5.9**	(2.24)	6.9	(2.75)
very likely					**11.9**	(3.46)	**13.3**	(3.95)
Performance information is communicated to parents					0.7	(0.98)	0.7	(1.06)
Performance information is communicated to school principal					-0.5	(0.65)	-0.2	(0.62)
Performance information is communicated to local education authorities					-0.2	(0.66)	-0.2	(0.88)

Note: Values that are statistically significant at $p<0.01$ are indicated in bold. Averages exclude Italy, Japan, the Netherlands, Norway and Poland.
A regression coefficient indicates to what extent the score on the dependent variable (the reading literacy scores) tends to go up (or down, in the case of negative values) by an increase of one unit (*e.g.* a student is one month older than the average student age, or a school's score on one of the school climate, school resources or school policies indices is one point higher) on a specific independent variable, while all other variables are constant. In some cases the independent variables are not continuous but dichotomous (*e.g.* girls versus boys, independent private schools versus public schools). In those cases the regression coefficient indicates to what extent the score on the dependent variable tends to change if the student is a girl instead of a boy, or if the school is an independent private school instead of a public school. All explanatory variables with the exception of the dichotomous variables have been transformed into z-scores.

Table 5.8
Correlations between autonomy indicators and school characteristics for all PISA countries

	Autonomy in the domain of							
	Personnel management		Financial resources		Student policies		Curriculum and instruction	
	Correlation	S.E.	Correlation	S.E.	Correlation	S.E.	Correlation	S.E.
School size	-0.11	(0.01)	0.01	(0.01)	-0.08	(0.01)	0.00	(0.01)
School type	-0.20	(0.01)	-0.18	(0.02)	-0.11	(0.01)	-0.14	(0.01)
Quality of educational resources	0.04	(0.01)	0.16	(0.01)	-0.07	(0.01)	-0.03	(0.01)
Quality of physical infrastructure	0.02	(0.01)	0.05	(0.01)	-0.06	(0.01)	-0.06	(0.01)
Good disciplinary climate as influenced by teachers	0.04	(0.02)	0.03	(0.01)	0.03	(0.01)	0.00	(0.01)
Good disciplinary school climate as influenced by students	0.01	(0.01)	0.04	(0.01)	0.04	(0.01)	0.01	(0.01)
Teacher morale and commitment	0.11	(0.01)	0.05	(0.01)	0.02	(0.01)	0.00	(0.01)
Proportion of teachers with an ISCED 5A qualification in pedagogy	-0.04	(0.01)	0.06	(0.01)	-0.01	(0.01)	-0.02	(0.01)
Proportion of teachers fully certified	-0.03	(0.01)	0.07	(0.01)	-0.01	(0.02)	0.10	(0.01)
Proportion of teachers with an ISCED 5A qualification in the language of assessment	0.00	(0.01)	-0.01	(0.01)	0.04	(0.01)	0.13	(0.01)

Table 5.9

Distribution of PISA students enrolled in independent private schools, government-dependent private schools and public schools

Results based on reports from school principals and reported proportionate to the number of 15-year-olds enrolled in the school

		Independent private schools		Government-dependent private schools		Public schools	
		%	S.E.	%	S.E.	%	S.E.
OECD COUNTRIES	Australia	m	m	m	m	m	m
	Austria	m	m	m	m	m	m
	Belgium	m	m	m	m	m	m
	Canada	m	m	m	m	m	m
	Czech Republic	0.2	(0.2)	5.7	(1.6)	94.1	(1.6)
	Denmark	a	a	24.5	(2.3)	75.5	(2.3)
	Finland	a	a	2.8	(1.3)	97.2	(1.3)
	France	m	m	m	m	m	m
	Germany	a	a	4.1	(1.3)	95.9	(1.3)
	Greece	4.1	(2.1)	a	a	95.9	(2.1)
	Hungary	0.3	(0.3)	4.4	(1.6)	95.2	(1.7)
	Iceland	0.8	(0.0)	a	a	99.2	(0.0)
	Ireland	2.9	(1.4)	57.7	(2.4)	39.5	(2.0)
	Italy	5.0	(1.4)	0.8	(0.8)	94.1	(1.6)
	Japan	29.6	(1.1)	0.8	(0.8)	69.6	(1.0)
	Korea	33.6	(3.8)	15.7	(3.6)	50.7	(4.5)
	Luxembourg	m	m	m	m	m	m
	Mexico	14.9	(3.1)	a	a	85.1	(3.1)
	New Zealand	4.8	(0.6)	0.1	(0.1)	95.1	(0.6)
	Norway	a	a	1.4	(0.9)	98.6	(0.9)
	Poland	2.9	(1.3)	a	a	97.1	(1.3)
	Portugal	1.5	(0.7)	5.9	(0.9)	92.6	(0.8)
	Spain	9.2	(2.5)	28.9	(3.3)	62.0	(2.0)
	Sweden	a	a	3.4	(0.7)	96.6	(0.7)
	Switzerland	4.6	(1.5)	1.2	(0.6)	94.1	(1.6)
	United Kingdom	9.2	(1.2)	a	a	90.8	(1.2)
	United States	4.3	(2.1)	1.1	(1.2)	94.6	(2.3)
	OECD average	*5.6*	*(0.3)*	*10.7*	*(0.3)*	*83.7*	*(0.4)*
PARTNER COUNTRIES	Albania	3.9	(0.8)	a	a	96.1	(0.8)
	Argentina	6.5	(2.4)	31.7	(8.3)	61.8	(7.8)
	Brazil	10.5	(2.2)	a	a	89.5	(2.2)
	Bulgaria	0.6	(0.6)	a	a	99.4	(0.6)
	Chile	12.9	(1.4)	32.8	(2.3)	54.3	(1.9)
	Hong Kong-China	0.5	(0.4)	4.4	(0.7)	95.1	(1.0)
	Indonesia	46.6	(5.4)	0.2	(0.1)	53.2	(5.4)
	Israel	4.2	(1.9)	20.3	(5.0)	75.4	(5.2)
	Latvia	a	a	0.8	(0.8)	99.2	(0.8)
	Liechtenstein	m	m	m	m	m	m
	FYR Macedonia	0.5	n	a	a	99.5	(0.0)
	Peru	6.7	(1.4)	0.8	(0.7)	92.4	(1.6)
	Russian Federation	a	a	a	a	100.0	(0.0)
	Thailand	17.5	(2.7)	1.8	(1.0)	80.7	(2.2)
	Average of countries participating in PISA	*6.5*	*(0.3)*	*9.2*	*(0.4)*	*84.3*	*(0.4)*
	Netherlands[1]	a	a	73.9	(5.2)	26.1	(5.2)

1. Response rate is too low to ensure comparability.

Table 5.10

School average socio-economic status[1] by type of school

Results based on students' self-reports and reported proportionate to the number of 15-year-olds enrolled in the school

		Independent private schools		Government-dependent private schools		Public schools	
		Mean	S.E.	Mean	S.E.	Mean	S.E.
OECD COUNTRIES	Australia	m	m	m	m	m	m
	Austria	m	m	m	m	m	m
	Belgium	m	m	m	m	m	m
	Canada	m	m	m	m	m	m
	Czech Republic	60.2	(0.7)	47.3	(1.8)	48.3	(0.3)
	Denmark	a	a	50.6	(0.9)	49.4	(0.5)
	Finland	a	a	55.1	(3.0)	49.9	(0.4)
	France	m	m	m	m	m	m
	Germany	a	a	56.9	(1.8)	48.6	(0.4)
	Greece	66.3	(3.5)	a	a	46.3	(0.6)
	Hungary	38.0	n	51.8	(3.6)	49.2	(0.5)
	Iceland	63.8	(0.4)	a	a	52.7	n
	Ireland	62.5	(0.8)	50.0	(0.5)	44.5	(0.7)
	Italy	53.6	(2.0)	44.4	n	46.8	(0.3)
	Japan	m	m	m	m	m	m
	Korea	44.1	(0.7)	40.3	(1.7)	42.7	(0.8)
	Luxembourg	m	m	m	m	m	m
	Mexico	58.2	(1.5)	a	a	39.5	(0.5)
	New Zealand	64.0	(1.3)	34.0	n	51.6	(0.3)
	Norway	a	a	54.9	(5.3)	53.8	(0.4)
	Poland	57.6	(3.9)	a	a	45.3	(0.5)
	Portugal	56.1	(7.0)	41.7	(2.1)	43.7	(0.6)
	Spain	62.7	(1.4)	46.4	(1.3)	41.3	(0.6)
	Sweden	a	a	54.6	(2.2)	50.4	(0.4)
	Switzerland	63.2	(2.1)	51.5	(2.6)	48.2	(0.4)
	United Kingdom	64.8	(0.9)	a	a	49.8	(0.3)
	United States	55.1	(3.9)	47.7	(n)	51.5	(0.6)
	OECD average	*54.8*	*(0.6)*	*48.6*	*(0.3)*	*47.9*	*(0.1)*
PARTNER COUNTRIES	Albania	54.7	(2.1)	a	a	44.7	(0.4)
	Argentina	65.0	(2.3)	46.1	(2.5)	39.4	(1.1)
	Brazil	56.6	(2.1)	a	a	41.3	(0.7)
	Bulgaria	68.7	n	a	a	49.8	(0.6)
	Chile	57.4	(1.7)	39.4	(0.8)	35.4	(0.7)
	Hong Kong-China	61.5	n	40.3	(1.0)	42.2	(0.4)
	Indonesia	35.9	(1.2)	21.1	(0.5)	36.3	(1.2)
	Israel	65.6	(3.0)	54.0	(2.8)	53.7	(0.9)
	Latvia	a	a	47.2	n	50.6	(0.7)
	Liechtenstein	m	m	m	m	m	m
	FYR Macedonia	60.0	n	a	a	46.8	(0.2)
	Peru	52.2	(3.3)	42.6	(0.3)	37.5	(0.6)
	Russian Federation	a	a	a	a	49.2	(0.4)
	Thailand	35.9	(1.4)	32.4	(6.4)	32.3	(0.5)
	Average of countries participating in PISA	*50.5*	*(0.5)*	*47.5*	*(0.4)*	*46.5*	*(0.1)*
	Netherlands[2]	a	a	51.4	(0.8)	49.1	(1.3)

1. Based on PISA International Socioeconomic Index of Occupational Status (HISEI) with values ranging between 16 and 90. Low values indicate low socio-economic status, high values respresent high socio-economic status.
2. Response rate is too low to ensure comparability.

Table 5.11

Percentage of students enrolled in public and private schools in which decisions on the following aspects of personnel management, financial resources, student policies, and curriculum and instruction are taken at the school level

Results based on reports from school principals and reported proportionate to the number of 15-year-olds enrolled in the school

	Independent private schools		Government-dependent private schools		Public schools	
	%[1]	S.E.	%[1]	S.E.	%[1]	S.E.
Appointing teachers	81	(2.4)	86	(1.5)	58	(0.5)
Dismissing teachers	72	(3.4)	81	(1.8)	50	(0.6)
Establishing teachers' starting salaries	62	(3.7)	13	(1.4)	23	(0.6)
Determining teachers' salary increases	60	(3.6)	12	(1.5)	27	(0.7)
Formulating the school budget	93	(1.7)	96	(0.9)	70	(0.7)
Deciding on budget allocations within the school	96	(1.5)	99	(0.5)	95	(0.4)
Establishing student disciplinary policies	100	(0.3)	94	(0.5)	93	(0.2)
Establishing student assessment policies	97	(1.2)	92	(1.0)	87	(0.5)
Approving students for admittance to school	96	(1.6)	94	(1.5)	81	(0.6)
Choosing which textbooks are used	100	(0.3)	95	(0.2)	90	(0.3)
Determining course content	89	(2.2)	60	(2.3)	68	(0.7)
Deciding which courses are offered	90	(2.2)	74	(2.1)	68	(0.8)

1. A percentage represents the sum of the percentage of decisions taken by each of the following four actors: school board, principal, department head, teachers.

Table 5.12

School characteristics of public and private schools for all countries participating in PISA 2000[1]

Results based on reports from school principals and reported proportionate to the number of 15-year-olds enrolled in the school

	Independent private schools		Government-dependent private schools		Public schools	
	Mean	S.E.	Mean	S.E.	Mean	S.E.
School size						
School size	856.94	(42.79)	667.67	(22.25)	773.39	(6.18)
Infrastructure and climate						
Quality of educational resources	0.22	(0.08)	0.18	(0.05)	-0.28	(0.01)
Quality of physical infrastructure	0.32	(0.06)	0.29	(0.04)	-0.08	(0.01)
Good disciplinary climate as influenced by teachers	0.39	(0.07)	0.19	(0.04)	-0.05	(0.01)
Good disciplinary school climate as influenced by students	0.71	(0.06)	0.40	(0.04)	-0.05	(0.01)
Teachers' morale and commitment	0.33	(0.06)	0.04	(0.04)	-0.09	(0.01)
Teacher qualifications						
Proportion of teachers with an ISCED 5A level in pedagogy	0.62	(0.02)	0.61	(0.02)	0.65	(0.00)
Proportion of fully certified teachers	0.74	(0.02)	0.80	(0.01)	0.79	(0.00)
Proportion of teachers with an ISCED 5A qualification in the language of assessment	0.80	(0.02)	0.70	(0.01)	0.77	(0.00)

1. For the definitions of the indices in the table see Annex A.

Table 5.13

Effects of school type on reading literacy[3] while adjusting for student level and school level factors (model 2), and effects without adjusting for these factors (model 1)

	Model 1 Gross, unadjusted effects				Model 2 Net effects, adjusted for student characteristics, school context and policy-amenable school characteristics			
	All PISA countries		OECD countries		All PISA countries		OECD countries	
	coefficient[3]	S.E.	coefficient	S.E.	coefficient	S.E.	coefficient	S.E.
Constant	460.45	(8.95)	489.72	(5.43)	471.34	(8.19)	497.69	(6.97)
School type[2]: independent private	43.15	(3.37)	42.54	(4.68)	-6.88	(2.16)[1]	-13.9	(2.79)[1]
School type[2]: government-dependent private	27.57	(3.19)	27.74	(3.57)	5.32	(1.91)[1]	4.25	(2.04)[1]
Student characteristics								
Grade level (deviation from country mode)					25.77	(0.22)[1]	30.31	(0.31)[1]
Age					-1.86	(0.16)[1]	-1.85	(0.20)[1]
In vocational programme (ISCED 2B, 2C, 3B or 3C)					-18.72	(0.76)[1]	-29.16	(1.00)[1]
Parents' occupational status (HISEI)					13.31	(0.17)[1]	15.07	(0.21)[1]
Female student					22.4	(0.32)[1]	24.26	(0.39)[1]
Immigrant					-22.06	(0.81)[1]	-31.74	(0.96)[1]
School context								
School average parents' occupational status (HISEI)					24.6	(0.56)[1]	23.98	(0.64)[1]
School location (reference category: town 15 000 - 100 000 inhabitants)								
Village, less than 3 000 inhabitants					0.28	(1.57)	6.52	(1.83)[1]
Small town, 3 000 - 15 000 inhabitants					0.91	(1.23)	3.84	(1.34)[1]
City, 100 000 - 1 000 000 inhabitants					-0.94	(1.22)	-3.02	(1.41)[1]
Large city, more than 1 000 000 inhabitants					-3.39	(1.86)	-5.21	(2.25)[1]
School resources[4]								
School size					1.87	(0.57)[1]	3.85	(0.78)[1]
Index of the quality of a school's physical infrastructure					-1.53	(0.49)[1]	-1.64	(0.58)[1]
Index of the quality of a school's educational resources					2.73	(0.53)[1]	1.66	(0.62)[1]
Proportion of computers available to 15-year-olds					-0.3	(0.46)	-0.04	(0.57)
Proportion of teachers with an ISCED 5A qualification in the language of assessment					3.34	(0.56)[1]	4.62	(0.67)[1]
Index of teacher shortage					0.6	(0.47)	1.03	(0.54)[1]
Student-teaching staff ratio					0.62	(0.67)	-0.47	(0.94)
Professional development					-0.59	(0.44)	-0.57	(0.48)
School climate								
Index of disciplinary climate					7.64	(0.51)[1]	8.07	(0.56)[1]
Index of teacher support					-3.08	(0.61)[1]	-4.41	(0.67)[1]
Index of achievement press					-0.3	(0.52)	-1.14	(0.59)
Index of teacher-student relations					-2.18	(0.59)[1]	0.24	(0.70)
Index of students' sense of belonging at school					7.91	(0.52)[1]	5.24	(0.59)[1]
Index of principals' perceptions of teacher-related factors affecting school climate					-4.21	(0.58)[1]	-3.9	(0.66)[1]
Index of principals' perceptions of student-related factors affecting school climate					9	(0.57)[1]	9.61	(0.66)[1]
Index of principals' perceptions of teachers' morale and commitment					1.9	(0.45)[1]	1.01	(0.51)
School policies								
Instructional time					0.95	(0.81)	0.73	(0.88)
Index of monitoring of student progress					1.1	(0.71)	0.14	(0.79)
Index of school self-evaluation					0.6	(0.72)	2.13	(0.83)[1]
Student's performance is considered for school admission					2.83	(0.56)[1]	4.22	(0.63)[1]
Study programme for 15-year-olds is based on students' academic record					-0.15	(0.59)	0.47	(0.69)
Study programme for 15-year-olds is based on students' placement exams					0.75	(0.54)	0.2	(0.67)
Transfer of low achievers to another school: likely					5.79	(1.20)[1]	6.6	(1.51)[1]
very likely					11.98	(1.85)[1]	13.37	(2.05)[1]
Performance information is communicated to parents					0.92	(0.60)	1.06	(0.67)[1]
Performance information is communicated to school principal					-0.4	(0.57)	-0.1	(0.61)
Performance information is communicated to local education authorities					-0.22	(0.45)	-0.25	(0.51)
Index of school autonomy					-2.03	(0.56)[1]	-1.8	(0.63)[1]
Index of teacher autonomy					0.37	(0.43)	0.52	(0.49)

1. Significant at $p<0.01$.
2. Japan was excluded from the analyses due to missing data on the relevant HISEI variable; the Netherlands was excluded due to a too low response rate.
3. A regression coefficient indicates to what extent the score on the dependent variable (the reading literacy scores) tends to go up (or down, in the case of negative values) by an increase of one unit (*e.g.* a student is one month older than the average student age, or a school's score on one of the school climate, school resources, or school process indices is one point higher) on a specific independent variable, while all other variables are constant. In some cases the independent variables are not continuous but dichotomous (*e.g.* girls versus boys, independent private schools versus public schools). In those cases the regression coefficient indicates to what extent the score on the dependent variable tends to change if the student is a girl instead of a boy, or if the school is an independent private school instead of a public school. All explanatory variables with the exception of the dichotomous variables have been transformed into z-scores.

Table 5.14
Mean student performance[1] in reading literacy by type of school

			Public schools	Independent private schools	Government-dependent private schools
OECD COUNTRIES	Czech Republic	Mean score	490	**552**	503
		Adjusted mean score	674	**643**	673
	Denmark	Mean score	497	n	497
		Adjusted mean score	484	n	478
	Finland	Mean score	547	n	564
		Adjusted mean score	699	n	712
	Germany	Mean score	486	a	**562**
		Adjusted mean score	457	a	441
	Greece	Mean score	460	493	a
		Adjusted mean score	474	459	a
	Hungary	Mean score	462	**394**	469
		Adjusted mean score	671	654	663
	Iceland	Mean score	506	**538**	a
		Adjusted mean score	494	521	a
	Ireland	Mean score	498	**588**	**541**
		Adjusted mean score	489	502	502
	Italy	Mean score	480	**516**	**413**
		Adjusted mean score	499	497	**444**
	Japan	Mean score	526	517	**565**
		Adjusted mean score	a	a	a
	Korea	Mean score	514	524	519
		Adjusted mean score	512	**499**	506
	Mexico	Mean score	413	**482**	a
		Adjusted mean score	438	425	a
	New Zealand	Mean score	525	**597**	**405**
		Adjusted mean score	512	518	564
	Norway	Mean score	504	a	513
		Adjusted mean score	503	a	506
	Poland	Mean score	461	504	a
		Adjusted mean score	391	**309**	a
	Portugal	Mean score	473	470	478
		Adjusted mean score	508	494	509
	Spain	Mean score	477	**542**	**509**
		Adjusted mean score	490	494	497
	Sweden	Mean score	516	a	521
		Adjusted mean score	486	a	488
	Switzerland	Mean score	484	492	518
		Adjusted mean score	467	**435**	470
	United Kingdom	Mean score	516	**608**	a
		Adjusted mean score	508	490	a
	United States	Mean score	488	541	**524**
		Adjusted mean score	501	513	521

Note: A multilevel model is run for each country. As a result, averages across countries cannot be calculated. Statistically significant differences between the specified type of private school and public schools are indicated in bold.
1. Adjusted mean score shows the mean score adjusted for student characteristics and school context (see Annex A for details).

Table 5.14
Mean student performance[1] in reading literacy by type of school (continued)

PARTNER COUNTRIES

		Public schools	Independent private schools	Government-dependent private schools
Albania	Mean score	338	**429**	a
	Adjusted mean score	320	**368**	a
Argentina	Mean score	384	**489**	**479**
	Adjusted mean score	426	419	438
Brazil	Mean score	365	472	a
	Adjusted mean score	412	**426**	a
Bulgaria	Mean score	414	**597**	a
	Adjusted mean score	388	451	a
Chile	Mean score	373	**482**	**402**
	Adjusted mean score	304	300	303
Hong Kong-China	Mean score	528	**465**	**465**
	Adjusted mean score	414	424	**361**
Indonesia	Mean score	362	**340**	**297**
	Adjusted mean score	550	545	548
Israel	Mean score	447	**511**	462
	Adjusted mean score	400	411	394
Latvia	Mean score	453	a	457
	Adjusted mean score	475	a	554
Peru	Mean score	298	**429**	**379**
	Adjusted mean score	379	399	380
Thailand	Mean score	435	439	408
	Adjusted mean score	520	501	477
FYR Macedonia	Mean score	372	418	a
	Adjusted mean score	386	425	a
Netherlands[2]	Mean score	529	a	546
	Adjusted mean score	557	a	566

Note: A multilevel model is run for each country. As a result, averages across countries cannot be calculated. Statistically significant differences between the specified type of private school and public schools are indicated in bold.
1. Adjusted mean score shows the mean score adjusted for student characteristics and school context (see Annex A for details).
2. Response rate is too low to ensure comparability.

Table 5.15a
School conditions per school type
Results based on reports from school principals and reported proportionate to the number of 15-year-olds enrolled in the school

		Quality of educational resources						Quality of physical resources infrastructure					
		Independent private schools		Government-dependent private schools		Public schools		Independent private schools		Government-dependent private schools		Public schools	
		Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
OECD COUNTRIES	Australia	m	m	m	m	m	m	m	m	m	m	m	m
	Austria	m	m	m	m	m	m	m	m	m	m	m	m
	Belgium	m	m	m	m	m	m	m	m	m	m	m	m
	Canada	m	m	m	m	m	m	m	m	m	m	m	m
	Czech Republic	0.42	(0.15)	0.32	(0.38)	0.21	(0.09)	1.12	n	0.75	(0.19)	0.65	(0.05)
	Denmark	a	a	0.45	(0.08)	0.19	(0.07)	a	a	0.17	(0.14)	-0.15	(0.10)
	Finland	a	a	0.23	(0.28)	-0.24	(0.06)	a	a	0.38	(0.27)	-0.24	(0.08)
	France	m	m	m	m	m	m	m	m	m	m	m	m
	Germany	a	a	0.33	(0.23)	-0.21	(0.08)	a	a	0.51	(0.21)	0.12	(0.07)
	Greece	1.49	(0.43)	a	a	-1.05	(0.08)	0.53	(0.45)	a	a	-1.28	(0.11)
	Hungary	-0.29	n	0.27	(0.40)	0.51	(0.08)	-0.07	n	0.35	(0.34)	0.42	(0.08)
	Iceland	-0.67	(0.01)	a	a	-0.19	n	-0.08	(0.06)	a	a	0.31	n
	Ireland	0.46	(0.22)	-0.29	(0.13)	-0.07	(0.15)	0.31	(0.32)	0.15	(0.12)	0.26	(0.13)
	Italy	0.57	(0.41)	-0.99	n	n	(0.08)	0.85	(0.17)	-0.39	n	-0.30	(0.10)
	Japan	0.28	(0.13)	1.90	n	-0.14	(0.09)	0.11	(0.15)	1.12	n	-0.36	(0.09)
	Korea	0.32	(0.14)	-0.13	(0.18)	-0.09	(0.10)	-0.18	(0.14)	-0.32	(0.23)	-0.43	(0.11)
	Luxembourg	m	m	m	m	m	m	m	m	m	m	m	m
	Mexico	0.45	(0.22)	a	a	-1.21	(0.08)	0.47	(0.21)	a	a	-0.56	(0.10)
	New Zealand	1.31	(0.35)	1.80	n	0.06	(0.06)	0.61	(0.21)	1.12	n	0.08	(0.06)
	Norway	a	a	0.59	(0.30)	-0.56	(0.07)	a	a	-0.39	(0.41)	-0.59	(0.07)
	Poland	0.45	(0.42)	a	a	-0.20	(0.10)	0.71	(0.20)	a	a	-0.17	(0.10)
	Portugal	0.13	(0.23)	1.11	(0.32)	0.08	(0.09)	1.01	(0.11)	0.82	(0.20)	0.08	(0.07)
	Spain	1.23	(0.19)	0.28	(0.15)	-0.11	(0.11)	0.99	(0.08)	0.49	(0.15)	-0.19	(0.09)
	Sweden	a	a	-0.30	(0.17)	0.01	(0.07)	a	a	n	(0.19)	0.01	(0.08)
	Switzerland	0.11	(0.28)	0.20	(0.49)	0.55	(0.08)	0.77	(0.20)	-0.17	(0.69)	0.52	(0.07)
	United Kingdom	1.28	(0.18)	a	a	-0.61	(0.06)	0.84	(0.22)	a	a	-0.53	(0.08)
	United States	0.21	(0.22)	1.90	n	0.39	(0.08)	0.54	(0.28)	1.12	n	0.18	(0.08)
	OECD average	*0.50*	*(0.07)*	*0.24*	*(0.05)*	*-0.09*	*(0.02)*	*0.30*	*(0.07)*	*0.27*	*(0.04)*	*-0.08*	*(0.02)*
PARTNER COUNTRIES	Albania	-0.25	(0.13)	a	a	-1.66	(0.04)	0.54	(0.11)	a	a	-0.42	(0.06)
	Argentina	0.88	(0.26)	-0.19	(0.25)	-0.89	(0.11)	0.59	(0.28)	0.39	(0.26)	-0.51	(0.19)
	Brazil	1.09	(0.18)	a	a	-0.54	(0.08)	0.90	(0.08)	a	a	0.26	(0.06)
	Bulgaria	1.90	n	a	a	-0.50	(0.11)	1.12	n	a	a	0.20	(0.09)
	Chile	0.37	(0.19)	0.17	(0.13)	-0.74	(0.12)	0.70	(0.14)	0.72	(0.07)	-0.06	(0.11)
	Hong Kong-China	-0.46	n	0.53	(0.42)	0.66	(0.10)	-0.70	n	0.30	(0.31)	0.27	(0.06)
	Indonesia	-1.04	(0.14)	0.06	(0.62)	-0.96	(0.13)	-0.19	(0.25)	0.34	(1.07)	-0.21	(0.18)
	Israel	0.24	(0.43)	-0.11	(0.25)	0.24	(0.17)	-0.01	(0.40)	-0.43	(0.29)	-0.45	(0.13)
	Latvia	a	a	-0.11	n	-0.64	(0.09)	a	a	-0.39	n	-0.01	(0.10)
	Liechtenstein	m	m	m	m	m	m	m	m	m	m	m	m
	FYR Macedonia	1.32	n	a	a	-0.43	(0.03)	1.12	n	a	a	-0.07	(0.02)
	Peru	0.16	(0.31)	-0.58	(0.31)	-1.42	(0.10)	0.82	(0.23)	n	(0.10)	-0.30	(0.10)
	Russian Federation	a	a	a	a	-1.29	(0.08)	a	a	a	a	-0.53	(0.09)
	Thailand	0.26	(0.44)	-0.97	(0.79)	-1.05	(0.08)	0.77	(0.21)	0.10	(0.29)	-0.04	(0.08)
	Average of countries participating in PISA	*0.22*	*(0.08)*	*0.18*	*(0.05)*	*-0.28*	*(0.01)*	*0.32*	*(0.06)*	*0.29*	*(0.04)*	*-0.08*	*(0.01)*
	Netherlands[1]	a	a	0.12	(0.13)	0.05	(0.23)	a	a	0.15	(0.15)	-0.06	(0.21)

Note: Values express standardised units; a low value indicates a low score on an index.
1. Response rate is too low to ensure comparability.

Table 5.15b
School conditions per school type (continued)

		Teacher-related factors affecting school climate						Student-related factors affecting school climate					
		Independent private schools		Government-dependent private schools		Public schools		Independent private schools		Government-dependent private schools		Public schools	
		Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
OECD COUNTRIES	Australia	m	m	m	m	m	m	m	m	m	m	m	m
	Austria	m	m	m	m	m	m	m	m	m	m	m	m
	Belgium	m	m	m	m	m	m	m	m	m	m	m	m
	Canada	m	m	m	m	m	m	m	m	m	m	m	m
	Czech Republic	1.53	(0.08)	0.87	(0.31)	0.51	(0.05)	.72	(.13)	0.52	(0.19)	0.56	(0.07)
	Denmark	a	a	1.22	(0.10)	0.67	(0.08)	a	a	1.10	(0.13)	0.60	(0.06)
	Finland	a	a	0.40	(0.30)	-0.09	(0.06)	a	a	-0.30	(0.35)	-0.42	(0.05)
	France	m	m	m	m	m	m	m	m	m	m	m	m
	Germany	a	a	0.01	(0.20)	-0.18	(0.05)	a	a	0.37	(0.25)	-0.13	(0.05)
	Greece	-1.57	(1.42)	a	a	-1.22	(0.13)	-0.51	(0.99)	a	a	-1.12	(0.10)
	Hungary	0.06	n	0.28	(0.40)	0.41	(0.08)	0.64	n	0.60	(0.36)	0.10	(0.09)
	Iceland	2.41	n	a	a	0.32	n	0.54	(0.04)	a	a	-0.23	n
	Ireland	0.47	(0.68)	n	(0.12)	-0.06	(0.10)	0.76	(0.53)	-0.14	(0.09)	-0.40	(0.08)
	Italy	0.88	(0.30)	-0.02	n	n	(0.10)	0.64	(0.39)	0.33	n	0.17	(0.07)
	Japan	0.13	(0.22)	0.23	n	0.11	(0.09)	0.79	(0.15)	0.64	n	0.66	(0.11)
	Korea	0.62	(0.10)	0.13	(0.20)	0.30	(0.12)	1.45	(0.13)	0.76	(0.28)	0.60	(0.13)
	Luxembourg	m	m	m	m	m	m	m	m	m	m	m	m
	Mexico	-0.25	(0.24)	a	a	-0.71	(0.09)	0.43	(0.21)	a	a	-0.13	(0.11)
	New Zealand	0.64	(0.26)	1.13	n	-0.08	(0.06)	0.72	(0.25)	0.64	(0.00)	-0.23	(0.05)
	Norway	a	a	0.95	(0.72)	-0.31	(0.05)	a	a	0.56	(0.61)	-0.21	(0.05)
	Poland	0.63	(0.22)	a	a	0.08	(0.10)	0.56	(0.28)	a	a	0.02	(0.11)
	Portugal	0.48	(0.14)	0.38	(0.30)	-0.35	(0.08)	0.59	(0.16)	1.06	(0.33)	-0.43	(0.07)
	Spain	1.11	(0.18)	0.65	(0.13)	-0.19	(0.09)	0.99	(0.15)	0.52	(0.16)	-0.42	(0.09)
	Sweden	a	a	0.65	(0.40)	-0.02	(0.07)	a	a	0.14	(0.17)	-0.06	(0.06)
	Switzerland	0.63	(0.45)	0.39	(0.33)	0.10	(0.06)	0.59	(0.39)	0.95	(0.29)	-0.04	(0.06)
	United Kingdom	1.55	(0.24)	a	a	-0.25	(0.06)	1.93	(0.16)	a	a	-0.15	(0.05)
	United States	0.02	(0.33)	0.23	n	-0.08	(0.10)	0.55	(0.19)	0.97	n	-0.29	(0.07)
	OECD average	*0.44*	*(0.09)*	*0.26*	*(0.05)*	*-0.07*	*(0.02)*	*0.89*	*(0.08)*	*0.34*	*(0.04)*	*-0.10*	*(0.02)*
PARTNER COUNTRIES	Albania	1.00	(0.04)	a	a	-0.07	(0.07)	1.85	(0.19)	a	a	0.53	(0.09)
	Argentina	0.48	(0.20)	0.23	(0.16)	-0.30	(0.12)	1.44	(0.36)	1.26	(0.18)	0.86	(0.16)
	Brazil	1.77	(0.18)	a	a	-0.01	(0.09)	1.17	(0.14)	a	a	-0.51	(0.10)
	Bulgaria	2.41	n	a	a	1.09	(0.09)	1.34	n	a	a	0.63	(0.08)
	Chile	0.39	(0.18)	-0.04	(0.15)	-0.57	(0.09)	1.06	(0.21)	0.41	(0.12)	-0.12	(0.12)
	Hong Kong-China	-0.02	n	0.28	(0.40)	0.13	(0.08)	0.04	n	-0.05	(0.33)	0.70	(0.10)
	Indonesia	-0.18	(0.20)	1.94	(0.64)	0.06	(0.19)	-0.12	(0.18)	2.02	(0.81)	0.14	(0.18)
	Israel	-0.23	(0.28)	-0.65	(0.30)	-0.78	(0.19)	0.31	(0.34)	-0.15	(0.17)	-0.52	(0.12)
	Latvia	a	a	1.13	n	0.60	(0.08)	a	a	-1.52	n	0.05	(0.08)
	Liechtenstein	m	m	m	m	m	m	m	m	m	m	m	m
	FYR Macedonia	2.41	n	a	a	0.34	(0.02)	2.61	n	a	a	0.41	(0.02)
	Peru	0.07	(0.30)	0.02	(0.06)	-0.41	(0.07)	0.55	(0.32)	0.12	(0.35)	-0.02	(0.07)
	Russian Federation	a	a	a	a	-0.76	(0.09)	a	a	a	a	-0.95	(0.08)
	Thailand	0.47	(0.25)	-0.55	(0.28)	-0.19	(0.07)	0.20	(0.24)	0.50	(0.26)	0.05	(0.07)
	Average of countries participating in PISA	*0.39*	*(0.07)*	*0.19*	*(0.04)*	*-0.05*	*(0.01)*	*0.71*	*(0.06)*	*0.40*	*(0.04)*	*-0.05*	*(0.01)*
	Netherlands[1]	a	a	-0.58	(0.10)	-0.78	(0.19)	a	a	-0.04	(0.09)	-0.34	(0.19)

Note: Values express standardised units; a low value indicates a low score on an index.
1. Response rate is too low to ensure comparability.

Table 5.15c
School conditions per school type (continued)

		Teachers' morale and commitment					
		Independent private schools		Government-dependent private schools		Public schools	
		Mean	S.E.	Mean	S.E.	Mean	S.E.
OECD COUNTRIES	Australia	m	m	m	m	m	m
	Austria	m	m	m	m	m	m
	Belgium	m	m	m	m	m	m
	Canada	m	m	m	m	m	m
	Czech Republic	-0.59	n	-0.52	(0.20)	-0.27	(0.05)
	Denmark	a	a	0.40	(0.15)	-0.09	(0.07)
	Finland	a	a	0.37	(0.16)	0.01	(0.06)
	France	m	m	m	m	m	m
	Germany	a	a	0.55	(0.25)	-0.03	(0.06)
	Greece	0.76	(0.38)	a	a	0.30	(0.12)
	Hungary	0.57	n	0.79	(0.28)	0.24	(0.08)
	Iceland	1.78	n	a	a	0.27	n
	Ireland	-0.06	(0.32)	0.28	(0.11)	0.10	(0.13)
	Italy	0.17	(0.44)	-1.18	n	-0.74	(0.07)
	Japan	0.20	(0.23)	1.05	n	0.09	(0.13)
	Korea	-0.43	(0.15)	-0.71	(0.22)	-0.94	(0.11)
	Luxembourg	m	m	m	m	m	m
	Mexico	0.84	(0.20)	a	a	0.37	(0.10)
	New Zealand	0.12	(0.61)	-0.59	n	0.23	(0.07)
	Norway	a	a	1.10	(0.26)	-0.11	(0.06)
	Poland	0.46	(0.38)	a	a	-0.55	(0.09)
	Portugal	0.38	(0.25)	0.05	(0.48)	-0.62	(0.07)
	Spain	0.37	(0.20)	0.08	(0.13)	-0.58	(0.08)
	Sweden	a	a	0.46	(0.30)	0.34	(0.08)
	Switzerland	1.07	(0.16)	0.24	(0.36)	0.38	(0.08)
	United Kingdom	1.11	(0.21)	a	a	-0.09	(0.08)
	United States	-1.13	(0.46)	-0.59	n	0.07	(0.09)
	OECD average	*0.20*	*(0.09)*	*0.12*	*(0.05)*	*-0.03*	*(0.02)*
PARTNER COUNTRIES	Albania	0.44	(0.03)	a	a	-0.24	(0.07)
	Argentina	-0.46	(0.14)	-0.06	(0.15)	-0.18	(0.10)
	Brazil	0.65	(0.24)	a	a	-0.58	(0.07)
	Bulgaria	1.78	n	a	a	0.25	(0.10)
	Chile	0.31	(0.22)	-0.22	(0.13)	-0.63	(0.09)
	Hong Kong-China	0.08	n	-0.86	(0.27)	-0.29	(0.08)
	Indonesia	1.04	(0.13)	-0.97	(0.79)	1.12	(0.22)
	Israel	n	(0.28)	-0.24	(0.22)	0.04	(0.09)
	Latvia	a	a	-1.55	n	-0.48	(0.09)
	Liechtenstein	m	m	m	m	m	m
	FYR Macedonia	1.48	n	a	a	-0.26	(0.02)
	Peru	0.06	(0.33)	0.49	(0.12)	-0.47	(0.09)
	Russian Federation	a	a	a	a	-0.15	(0.07)
	Thailand	-0.31	(0.13)	0.23	(0.41)	-0.41	(0.07)
	Average of countries participating in PISA	*0.33*	*(0.06)*	*0.04*	*(0.04)*	*-0.09*	*(0.01)*
	Netherlands[1]	a	a	-0.12	(0.08)	-0.23	(0.24)

1. Response rate is too low to ensure comparability.
Note: Values express standardised units; a low value indicates a low score on an index.

Table 6.1

Teachers with an ISCED 5A qualification in the language of assessment and quality of educational resources, by school average socio-economic status

Results based on reports from school principals and reported proportionate to the number of 15-year-olds enrolled in the school

		Percentage of students in schools with teachers possessing an ISCED 5A qualification in the language of assessment in the…						Quality of educational resources for schools in the…					
		Top quarter[1]		Middle half[1]		Bottom quarter[1]		Top quarter[1]		Middle half[1]		Bottom quarter[1]	
		%	S.E.	%	S.E.	%	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
OECD COUNTRIES	Australia	85	(3.29)	75	(2.69)	69	(4.56)	0.58	(0.16)	0.31	(0.11)	-0.08	(0.13)
	Austria	100	(0.00)	94	(1.98)	74	(5.94)	-0.19	(0.14)	0.12	(0.13)	0.03	(0.12)
	Belgium	48	(1.73)	41	(2.14)	26	(3.25)	0.45	(0.13)	0.47	(0.09)	0.41	(0.14)
	Canada	m	m	m	m	m	m	0.33	(0.08)	0.26	(0.06)	0.10	(0.08)
	Czech Republic	98	(1.70)	90	(1.87)	75	(4.04)	0.17	(0.13)	0.31	(0.14)	0.08	(0.12)
	Denmark	71	(2.87)	58	(2.28)	60	(3.58)	0.25	(0.11)	0.26	(0.09)	0.25	(0.10)
	Finland	91	(2.69)	86	(2.80)	86	(2.82)	0.05	(0.14)	-0.41	(0.08)	-0.13	(0.12)
	France	m	m	m	m	m	m	0.51	(0.12)	0.45	(0.10)	0.49	(0.17)
	Germany	94	(2.31)	75	(3.32)	59	(3.81)	-0.01	(0.10)	-0.30	(0.11)	-0.20	(0.13)
	Greece	m	m	m	m	m	m	-0.71	(0.28)	-1.04	(0.10)	-0.90	(0.16)
	Hungary	100	(0.00)	98	(1.53)	97	(1.39)	0.51	(0.13)	0.62	(0.09)	0.25	(0.18)
	Iceland	32	(0.00)	28	(0.00)	22	(0.00)	-0.29	(0.01)	-0.19	(0.00)	-0.10	(0.01)
	Ireland	96	(1.62)	96	(1.33)	94	(2.08)	-0.12	(0.12)	-0.25	(0.13)	-0.16	(0.21)
	Italy	97	(1.39)	89	(2.39)	83	(4.47)	-0.07	(0.13)	0.29	(0.12)	-0.22	(0.16)
	Japan	m	m	m	m	m	m	m	m	m	m	m	m
	Korea	100	(0.00)	100	(0.00)	100	(0.00)	0.08	(0.16)	-0.02	(0.12)	-0.05	(0.11)
	Luxembourg	88	(0.00)	82	(0.00)	64	(0.00)	0.10	(0.00)	0.27	(0.00)	-0.19	(0.00)
	Mexico	26	(8.51)	22	(5.60)	29	(8.70)	-0.04	(0.21)	-1.18	(0.11)	-1.40	(0.12)
	New Zealand	88	(1.99)	77	(2.52)	73	(3.80)	0.46	(0.11)	0.05	(0.09)	-0.10	(0.11)
	Norway	68	(3.99)	53	(3.34)	47	(4.63)	-0.45	(0.10)	-0.50	(0.10)	-0.74	(0.08)
	Poland	97	(2.13)	98	(0.57)	96	(2.16)	-0.06	(0.24)	-0.12	(0.13)	-0.40	(0.16)
	Portugal	92	(4.48)	96	(1.27)	93	(6.34)	0.36	(0.16)	0.06	(0.12)	0.07	(0.17)
	Spain	75	(4.93)	82	(3.32)	78	(3.47)	0.48	(0.23)	0.17	(0.10)	-0.19	(0.14)
	Sweden	76	(4.04)	68	(3.18)	59	(4.93)	0.30	(0.16)	-0.11	(0.09)	-0.10	(0.14)
	Switzerland	77	(3.62)	40	(3.28)	31	(6.17)	0.42	(0.11)	0.72	(0.10)	0.18	(0.17)
	United Kingdom	84	(3.57)	84	(2.35)	84	(3.30)	0.01	(0.14)	-0.57	(0.08)	-0.67	(0.13)
	United States	99	(0.95)	93	(2.70)	89	(6.69)	0.41	(0.11)	0.43	(0.12)	0.33	(0.18)
	OECD average	*80*	*(0.74)*	*77*	*(0.61)*	*72*	*(1.00)*	*0.17*	*(0.03)*	*0.01*	*(0.02)*	*-0.18*	*(0.03)*
PARTNER COUNTRIES	Albania	m	m	m	m	m	m	-1.53	(0.03)	-1.55	(0.07)	-1.81	(0.08)
	Argentina	m	m	m	m	m	m	0.32	(0.14)	-0.82	(0.23)	-1.06	(0.15)
	Brazil	92	(2.58)	86	(2.79)	82	(3.17)	0.39	(0.19)	-0.55	(0.14)	-0.72	(0.10)
	Bulgaria	97	(2.28)	93	(2.49)	92	(2.79)	-0.72	(0.19)	-0.22	(0.16)	-0.80	(0.14)
	Chile	74	(6.80)	67	(4.74)	51	(7.78)	0.20	(0.16)	-0.30	(0.11)	-0.76	(0.18)
	Hong Kong-China	60	(4.94)	53	(2.93)	57	(3.44)	0.51	(0.23)	0.56	(0.12)	1.01	(0.17)
	Indonesia	79	(6.01)	68	(3.69)	55	(7.84)	-0.94	(0.14)	-0.86	(0.12)	-1.17	(0.21)
	Israel	78	(10.67)	83	(6.31)	83	(9.77)	0.13	(0.19)	0.57	(0.20)	-0.60	(0.24)
	Latvia	95	(2.49)	79	(3.58)	69	(6.39)	-0.60	(0.14)	-0.71	(0.14)	-0.66	(0.19)
	Liechtenstein	81	(0.00)	36	(0.00)	45	(0.00)	-0.24	(0.00)	0.26	(0.00)	0.12	(0.00)
	FYR Macedonia	79	(0.00)	86	(1.37)	86	(0.00)	0.03	(0.00)	-0.55	(0.06)	-0.66	(0.04)
	Peru	83	(4.96)	83	(3.01)	62	(6.11)	-0.46	(0.18)	-1.43	(0.12)	-1.81	(0.11)
	Russian Federation	92	(3.01)	93	(1.37)	94	(1.91)	-1.12	(0.18)	-1.28	(0.12)	-1.41	(0.10)
	Thailand	87	(3.67)	78	(5.02)	69	(7.60)	-0.19	(0.16)	-0.72	(0.17)	-1.61	(0.11)
	Average of countries participating in PISA	*82*	*(0.62)*	*76*	*(0.52)*	*71*	*(0.86)*	*0.05*	*(0.02)*	*-0.15*	*(0.02)*	*-0.52*	*(0.03)*
	Netherlands[2]	92	(6.71)	88	(4.43)	73	(12.50)	0.41	(0.28)	0.07	(0.15)	-0.17	(0.27)

1. School average of students' parental occupational status (HISEI).
2. Response rate is too low to ensure comparability.

Table 6.2
Student performance differences in reading literacy by socio-economic background, migration background and gender

		Difference between top and bottom quarter of index of socio-economic status (HISEI)		Difference in score points between native students and non-native students (Nat. - non-nat.)		Difference in score points between female students and male students (F - M)	
		Difference	S.E.	Difference	S.E.	Difference	S.E.
OECD COUNTRIES	Australia	86	(6.65)	18	(9.90)	**34**	(6.23)
	Austria	89	(5.38)	**90**	(8.57)	**26**	(4.83)
	Belgium	98	(6.89)	**80**	(10.11)	**33**	(6.50)
	Canada	66	(2.99)	**27**	(5.13)	**32**	(2.45)
	Czech Republic	99	(4.30)	c	c	**37**	(4.83)
	Denmark	78	(4.86)	**68**	(7.92)	**25**	(4.12)
	Finland	53	(5.70)	**80**	(13.15)	**51**	(4.09)
	France	78	(5.55)	**73**	(11.85)	**29**	(4.43)
	Germany	115	(6.49)	**84**	(7.82)	**35**	(5.01)
	Greece	78	(7.87)	**75**	(18.12)	**37**	(7.63)
	Hungary	96	(7.55)	-5	(12.29)	**32**	(6.88)
	Iceland	50	(4.11)	c	c	**40**	(3.01)
	Ireland	78	(5.83)	**-46**	(9.71)	**29**	(5.49)
	Italy	66	(5.78)	c	c	**38**	(6.25)
	Japan	m	m	c	c	**30**	(8.63)
	Korea	32	(5.68)	a	a	**14**	(5.28)
	Luxembourg	101	(4.90)	**87**	(4.97)	**27**	(3.46)
	Mexico	93	(6.99)	**95**	(8.84)	**20**	(5.67)
	New Zealand	86	(6.16)	**27**	(8.07)	**46**	(5.65)
	Norway	68	(5.49)	**60**	(8.95)	**43**	(4.75)
	Poland	87	(8.45)	c	c	**36**	(8.15)
	Portugal	97	(7.00)	21	(16.42)	**25**	(6.80)
	Spain	68	(4.57)	34	(18.03)	**24**	(4.34)
	Sweden	72	(4.22)	**71**	(7.54)	**37**	(3.57)
	Switzerland	113	(6.79)	**106**	(7.39)	**30**	(6.62)
	United Kingdom	98	(4.84)	**70**	(15.29)	**26**	(4.59)
	United States	89	(9.35)	**42**	(12.36)	**29**	(10.45)
	OECD average	*92*	*(1.33)*	*58*	*(2.57)*	*32*	*(1.11)*
PARTNER COUNTRIES	Albania	89	(5.94)	c	c	**58**	(5.03)
	Argentina	106	(9.27)	c	c	**44**	(14.48)
	Brazil	68	(5.95)	c	c	**17**	(5.19)
	Bulgaria	95	(9.41)	c	c	**47**	(7.98)
	Chile	88	(5.24)	c	c	**25**	(6.30)
	Hong Kong-China	39	(6.60)	**26**	(5.54)	**16**	(5.95)
	Indonesia	63	(8.94)	c	c	**20**	(5.94)
	Israel	88	(11.47)	1	(17.57)	16	(13.56)
	Latvia	63	(8.86)	8	(9.41)	**53**	(7.73)
	Liechtenstein	88	(14.22)	**102**	(21.83)	**31**	(10.02)
	FYR Macedonia	80	(5.07)	**97**	(12.42)	**50**	(3.55)
	Peru	99	(8.20)	c	c	7	(8.25)
	Russian Federation	73	(6.74)	5	(10.53)	**38**	(6.10)
	Thailand	41	(7.00)	c	c	**41**	(4.95)
	Average of countries participating in PISA	*103*	*(1.13)*	*30*	*(2.35)*	*31*	*(1.05)*
	Netherlands[1]	71	(7.09)	**83**	(15.94)	**30**	(6.09)

Note: Significant differences are marked in bold. Performance differences between native and non-native students are only shown for countries where the non-native students comprise 1% or more of all 15-year-olds sampled.
1. Response rate is too low to ensure comparability.

Annex

C

THE DEVELOPMENT OF THE PISA THEMATIC REPORT – A COLLABORATIVE EFFORT

Introduction

PISA is a collaborative effort, bringing together scientific expertise from the participating countries, steered jointly by their governments on the basis of shared, policy-driven interests. The PISA Governing Board on which each country is represented determines, in the context of OECD objectives, the policy priorities for PISA and oversees adherence to these priorities during the implementation of the programme. This includes the setting of priorities for the development of indicators, for the establishment of the assessment instruments and for the reporting of the results.

Experts from participating countries also serve on working groups that are charged with linking policy objectives with the best internationally available technical expertise. By participating in these expert groups, countries ensure that: the instruments are internationally valid and take into account the cultural and educational contexts in OECD Member countries; the assessment materials have strong measurement properties; and the instruments place an emphasis on authenticity and educational validity.

Through National Project Managers, participating countries implement PISA at the national level subject to the agreed administration procedures. National Project Managers play a vital role in ensuring that the implementation of the survey is of high quality, and verify and evaluate the survey results, analyses, reports and publications.

The design and implementation of the surveys, within the framework established by the PISA Governing Board, is the responsibility of the PISA consortium, referred to as the PISA Consortium, led by the Australian Council for Educational Research (ACER). Other partners in this consortium include the Netherlands National Institute for Educational Measurement (Citogroep), The National Institute for Educational Research in Japan (NIER), the Educational Testing Service in the United States (ETS) and WESTAT in the United States.

The OECD Secretariat has overall managerial responsibility for the programme, monitors its implementation on a day-to-day basis, acts as the secretariat for the PISA Governing Board, builds consensus among countries and serves as the interlocutor between the PISA Governing Board and the international consortium charged with the implementation of the activities. The OECD Secretariat also produces the indicators and analyses and prepares the international reports and publications in co-operation with the PISA consortium and in close consultation with Member countries both at the policy level (PISA Governing Board) and at the level of implementation (National Project Managers).

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