LITERACY SKILLS FOR THE WORLD OF TOMORROW – FURTHER RESULTS FROM PISA 2000

EXECUTIVE SUMMARY

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

UNESCO INSTITUTE FOR STATISTICS

Organisation for Economic Co-operation and Development

Pursuant to Article 1 of the Convention signed in Paris on December 14, 1960, and which came into force on September 30, 1961, the Organisation for Economic Co-operation and Development (OECD) shall promote policies designed to:

- achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy;
- contribute to sound economic expansion in Member as well as non-member countries in the process of economic development; and
- contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

The original Member countries of the OECD are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The following countries became Members subsequently through accession at the dates indicated hereafter: Japan (April 28, 1964), Finland (January 28, 1969), Australia (June 7, 1971), New Zealand (May 29, 1973), Mexico (May 18, 1994), the Czech Republic (December 21, 1995), Hungary (May 7, 1996), Poland (November 22, 1996), Korea (December 12, 1996) and the Slovak Republic (December 14, 2000). The Commission of the European Communities takes part in the work of the OECD (Article 13 of the OECD Convention).

UNESCO

The constitution of the United Nations Educational, Scientific and Cultural Organization (UNESCO) was adopted by 20 countries at the London Conference in November 1945 and entered into effect on November 4, 1946. The Organization currently has 188 Member States.

The main objective of UNESCO is to contribute to peace and security in the world by promoting collaboration among nations through education, science, culture and communication in order to foster universal respect for justice, the rule of law, and the human rights and fundamental freedoms that are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations.

To fulfill its mandate, UNESCO performs five principal functions: 1) prospective studies on education, science, culture and communication for tomorrow's world; 2) the advancement, transfer and sharing of knowledge through research, training and teaching activities; 3) standard-setting actions for the preparation and adoption of internal instruments and statutory recommendations; 4) expertise through technical co-operation to Member States for their development policies and projects; and 5) the exchange of specialized information.

UNESCO is headquartered in Paris, France.

The UNESCO Institute for Statistics

The UNESCO Institute for Statistics (UIS) is the statistical office of UNESCO and is the UN depository for global statistics in the fields of education, science and technology, culture and communication.

UIS was established in 1999. It was created to improve UNESCO's statistical programme and to develop and deliver the timely, accurate and policy-relevant statistics needed in today's increasingly complex and rapidly changing social, political and economic environments.

UIS is based in Montréal, Canada.

Photo credit: PhotoDisc.

Literacy Skills for the World of Tomorrow – Further results from PISA 2000 Executive Summary

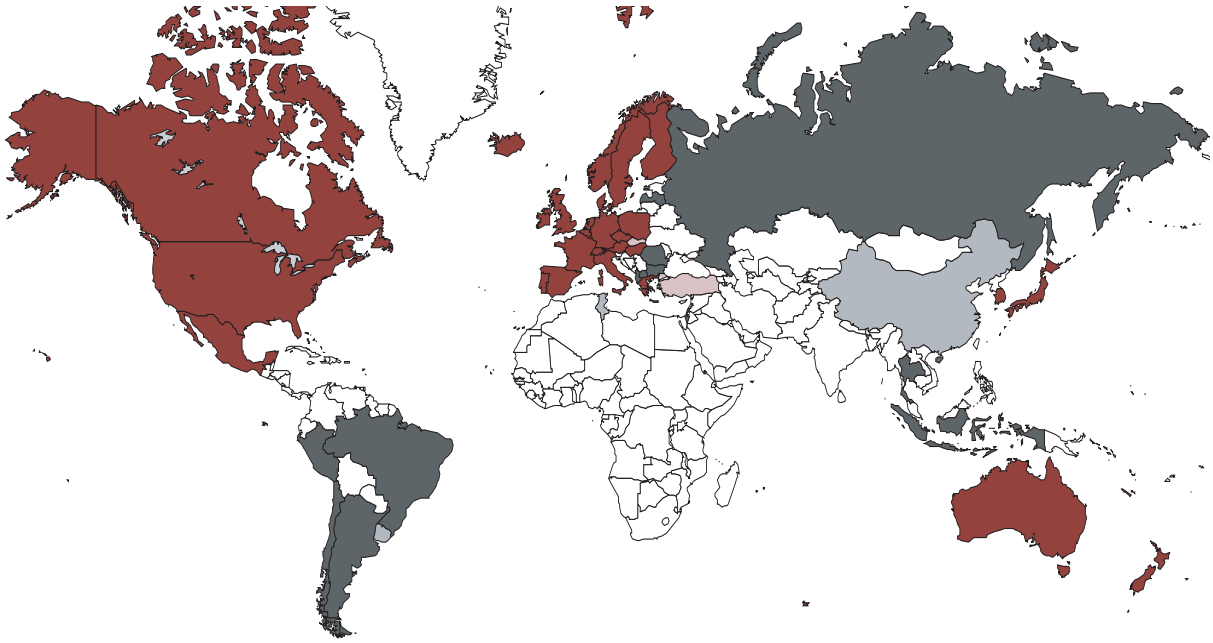
The Programme for International Student Assessment (PISA) is a collaborative effort among the participating countries to measure how well 15-year-olds, approaching the end of compulsory schooling, are prepared to meet the challenges of today's societies. PISA administers tests and background questionnaires to between 4,500 and 10,000 students in each participating country to assess three forms of literacy: reading, mathematical and scientific. The assessments focus on how well students apply knowledge and skills to tasks that are relevant to their future life, rather than on the memorisation of subject matter knowledge.

The assessment was first administered in 2000 in 32 countries, all but four of them members of the Organisation for Economic Co-operation and Development (OECD) (See Figure 1). In response to considerable worldwide interest in the study, the assessment was extended in 2001 to 11 additional non-OECD countries, bringing the total number of countries surveyed to 43. The results for the first 32 countries were reported in *Knowledge and Skills for Life* published in 2001. *Literacy Skills for the World of Tomorrow* expands on this analysis with particular reference to the results in the 15 non-OECD countries.

PISA provides important information on factors associated with students' literacy proficiency, including student engagement in the learning process, gender and family background, and offers insights into how characteristics of schools, such as the organisation of learning and the availability and management of resources, are associated with educational success.

As the programme is administered once every three years, it offers policy-makers a lens through which to monitor student outcomes over time and to assess the strengths and weaknesses of their own systems in the light of other countries' performance. Through PISA and related work, OECD and UNESCO seek to contribute to a shift in policy focus from educational inputs to learning outcomes, in order to assist countries in seeking to bring about improvements in schooling and better preparation for young people as they enter an adult life of rapid change and deepening global interdependence.

Figure 1. Countries participating in PISA



OECD countries participating in PISA 2000

Australia
Austria
Belgium
Canada
Czech Republic
Denmark
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Japan
Korea
Luxembourg
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Spain
Sweden
Switzerland
United Kingdom
United States

Additional OECD countries participating in PISA from 2003 onwards

Slovak Republic
Turkey

Non-OECD countries participating in PISA 2000

Albania
Argentina
Brazil
Bulgaria
Chile
Hong Kong-China
Indonesia
Israel
FYR Macedonia
Latvia
Liechtenstein
Peru
Romania
Russian Federation
Thailand

Additional non-OECD countries participating in PISA from 2003 onwards

China
Tunisia
Uruguay

Results from PISA 2000 for Romania were, for technical reasons, not available when the report went to print. These results are published in a separate addendum to the report.

STUDENT PERFORMANCE IN READING LITERACY

Reading is an increasingly essential prerequisite for success in today's societies. The interest, attitude and capacity of individuals to appropriately access, manage, integrate, evaluate and reflect on written information are all central to the full participation of individuals in modern life.

PISA constructed a reading literacy scale that summarises student performance across various aspects of reading literacy, with 500 the average score for OECD countries and two-thirds of students in these countries in the 400 to 600 range. To facilitate interpretation, the reading literacy scale was divided into five levels of proficiency. Level 1 represents those students who have serious difficulties in using reading as a tool to advance and extend their knowledge and skills in other areas. Level 5 indicates those students who are able to manage information that is presented in unfamiliar texts, show detailed understanding of complex texts and infer which information is relevant to the task, and critically evaluate and build hypotheses with the capacity to draw on specialised knowledge and concepts that may be contrary to expectations. The difference in reading scores between two adjacent proficiency levels is 72 points.

The results show wide differences between countries in the knowledge and skills of 15-year-olds in reading literacy. The equivalent of more than three proficiency levels, 267 points, separate the means of the highest-performing country (Finland) and the lowest (Peru) on the combined reading literacy scale.

See Table 2.3a in the report

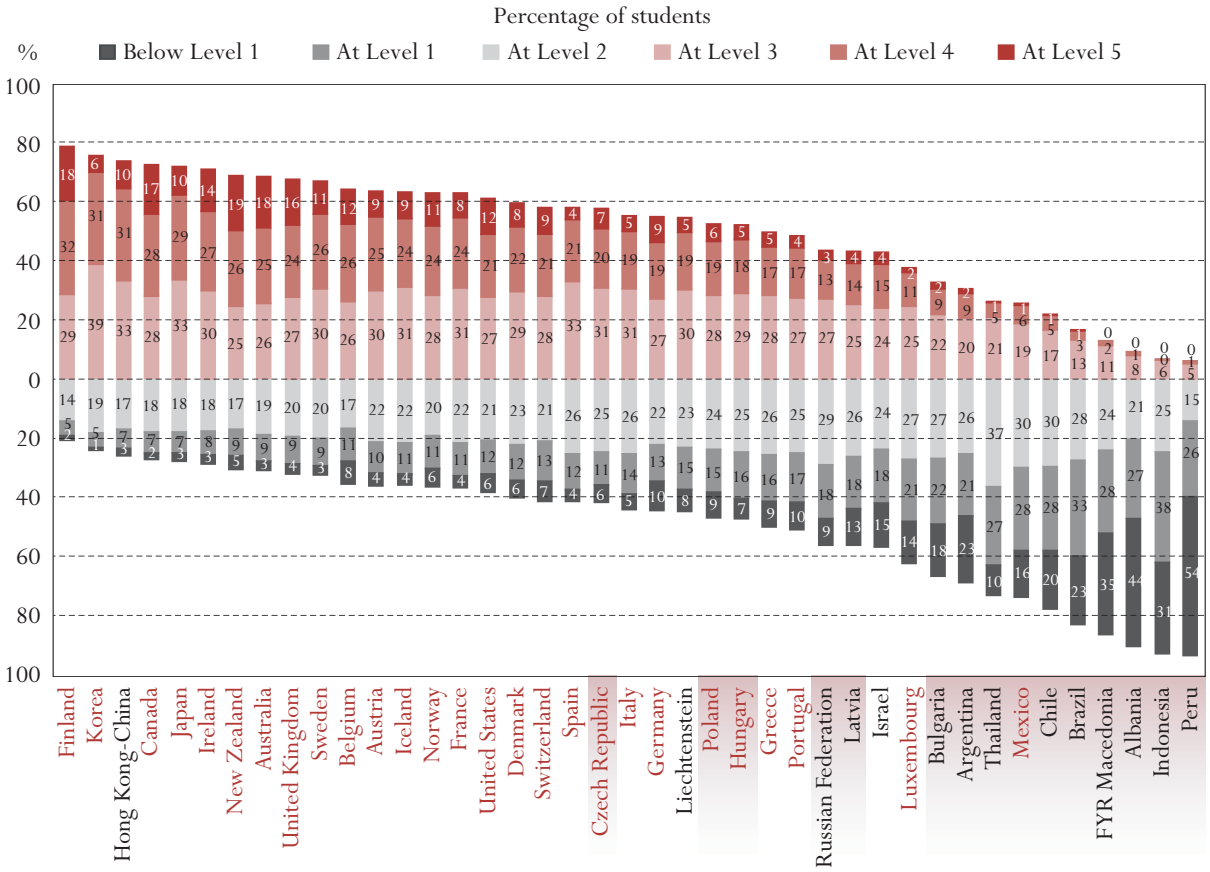
In every country, some proportion of 15-year-olds reach the highest proficiency level (Level 5). As Figure 2 shows, on average 10 per cent of the students in OECD countries perform at this level, while in non-OECD countries the proportion ranges from 10 per cent in Hong Kong-China to 0.1 per cent or less in Albania, Indonesia, FYR Macedonia and Peru.

See Table 2.1a in the report

At the lower end of the scale, 18 per cent of students among OECD countries and well over 50 per cent of the student population in Albania, Brazil, Indonesia, FYR Macedonia and Peru perform at Level 1 or below. These students, at best, can handle only the most basic reading tasks. Students at this level are not a random group. In virtually all countries the majority of them are male, and many are from disadvantaged backgrounds, and are foreign-born or have foreign-born parents. Even in countries that do well overall, the existence of a small but significant minority of students who, near the end of compulsory schooling, lack the foundation of literacy skills needed for further learning, must be of concern to policy-makers. This is particularly significant given mounting evidence that continuing education and training beyond school tends to reinforce rather than to mitigate skill differences resulting from unequal success in initial education.

See Table 2.1a in the report

Figure 2 Percentage of students performing at each of the proficiency levels on the combined reading literacy scale



Source: OECD PISA database, 2003. Table 2.1a.

Differences between countries represent, however, only a fraction of overall variation in student performance. Addressing the diversity of student learning needs and narrowing the gaps in student performance represent formidable challenges for all countries. For example, the difference between the scores of students at the 75th and 25th percentiles of the performance distribution – a statistic that is often used as a measure of equality in learning outcomes – ranges from less than 111 score points in the five Asian countries – Hong Kong-China, Indonesia, Japan, Korea and Thailand – to more than 150 points in Argentina and Israel. Disparities are apparent even within countries with similar levels of average performance. Indonesia and FYR Macedonia, for example, have similar mean scores on the combined reading literacy scale (371 and 373 respectively), but the range for the middle half of the student population in FYR Macedonia is 135 points, or 34 points higher than that of Indonesia.

See Table 2.3a in the report

To what extent is the variation in student performance on the PISA assessments a reflection of the distribution of students' innate abilities, and thus, a challenge for education systems that cannot be influenced directly by education policy? PISA shows that wide disparities in performance are not a necessary condition for a country to attain a high level of overall performance. Four out of the seven countries with the smallest differences between the 75th and 25th percentiles – Finland, Hong Kong-China, Japan and Korea – are also among the best-performing countries in reading literacy as measured by their mean score. Conversely, two countries with wide performance gaps – Argentina and Israel – have mean scores that are significantly below the OECD average.

See Table 2.3a in the report

Many factors contribute to variation in student performance. As the causes of variation in student performance vary, countries adopt different approaches to address the challenge. Some countries have school systems that seek to provide all students with the same opportunities for learning and require each school to accommodate to the full range of student learning needs. Other countries respond to diversity by grouping students of similar levels of performance into the same classes or schools.

How do such policies and practices affect actual student performance? There is no clear answer since differentiation is often applied informally within schools, which makes cross-national comparisons difficult. Nevertheless PISA reveals that in most countries, a considerable proportion of the variation in student performance lies between schools. Differences between schools exceed one third of the overall variation in student performance in a typical OECD country. Independent of whether overall variation is large or small, between-school variation amounts to more than half of total variation in 13 countries and 67 per cent or more in Austria, Belgium, Germany, Hungary and Poland. Non-OECD countries do not belong to the five most extreme cases. Nevertheless, in all of the non-OECD countries except Indonesia, Latvia, the Russian Federation and Thailand, performance differences between schools are larger than the OECD average level where between-school variance represents 36 per cent of total variance.

See Table 7.1a in the report

PISA results suggest that both overall variation in student performance, and the relative proportion of that variation that is found between schools, tend to be greater in those countries with explicit differentiation at an early age between types of programme and school. The data also suggest that the effects of social clustering are larger in school systems with differentiated types of school than in systems in which the curriculum does not vary significantly between schools.

STUDENT PERFORMANCE IN MATHEMATICAL AND SCIENTIFIC LITERACY

For much of the last century, the content of school mathematics and science curricula has been dominated by the need to provide the foundation for the professional training of a small number of mathematicians, scientists and engineers. Today, however, literacy in mathematics and science is important for all to understand medical, economic, environmental and other issues that shape modern societies, which rely heavily on technological and scientific advances. PISA looked at mathematics in relation to its use in people's lives and assessed the capacity of students to recognise and interpret mathematical problems; translate these problems into a mathematical context; use mathematical knowledge and procedures to solve problems; interpret the results in terms of the original problem; reflect on the methods applied; and formulate and communicate the outcomes.

As with reading literacy, PISA found wide variation between countries in overall performance in mathematics across these different aspects. Students in Hong Kong-China, Japan and Korea displayed the highest mean scores in mathematical literacy. The lowest average score came from Peru. Other than Hong Kong-China, only one non-OECD country, Liechtenstein, registered a mean score above the OECD average.

See Table 3.1 in the report

Differences in mathematical performance within countries are also pronounced, but, as in the case of reading, some countries succeed in reaching high levels of student performance without large disparities. It is striking that five out of the seven countries with the smallest differences between the 75th and 25th percentiles – Canada, Finland, Iceland, Japan and Korea – all perform statistically significantly above the OECD average. Likewise, the five countries with the most unequal distribution of mathematical literacy skills – Albania, Argentina, Bulgaria, Greece and Israel – all perform significantly below this level.

See Table 3.1 in the report

Scientific literacy in PISA was scored on a scale measuring students' capacity to: use scientific knowledge; recognise scientific questions; identify what is involved in scientific investigations; relate scientific data to claims and conclusions; and to communicate these aspects of science.

As with mathematical literacy, Hong Kong-China, Japan and Korea show the highest overall performance in scientific literacy. The range of average scores between the highest and the lowest performing countries in scientific literacy is also very large, with very high performing countries scoring around 0.5 standard deviations above the OECD average and the five lowest performing countries – all non-OECD – performing between 1.0 and 1.7 standard deviations below this level. The distribution of scientific literacy scores within countries is similar to the patterns found in mathematics.

See Table 3.2 in the report

THE ECONOMIC CONTEXT AND EDUCATION SYSTEMS

When comparing the results from PISA across countries, it is important to consider the context in which education systems operate. The 15 non-OECD countries participating in PISA share demographic, educational and economic features that distinguish them from the OECD countries.

For example, sizeable proportions of children do not make it to secondary school in some of the non-OECD countries, with enrolment rates in secondary schools ranging from close to the OECD average of 11 per cent in Israel and Bulgaria to 52 per cent in Indonesia. High repetition rates are also a frequent problem. Finally, enrolment rates in tertiary education vary widely across non-OECD countries, from 15 per cent in Albania and Brazil to 65 per cent in the Russian Federation.

See Table 1.3 in the report

The non-OECD countries also vary widely in their financial capacity to provide quality education services. The wealthiest of them, have per capita incomes more than four times greater than the poorest ones, and there are non-OECD countries where the distribution of income is both more equal and less equal than the OECD average. The share of national wealth spent on education also varies across countries.

Countries with higher national income or gross domestic product (GDP) tend to perform better than countries with lower national income on a scale that combines results in reading, mathematical and scientific literacy. Without necessarily constituting a causal relationship, 43 per cent of the variation between countries' mean scores can be predicted on the basis of their GDP per capita. Beyond the relationships between average performance and average GDP per capita, PISA also suggests that higher levels of income inequality tend to be associated with lower levels of average performance. The relationship is fairly consistent, with a measure of income inequality (Gini index) explaining 26 per cent of the variation in average performance among the participating countries.

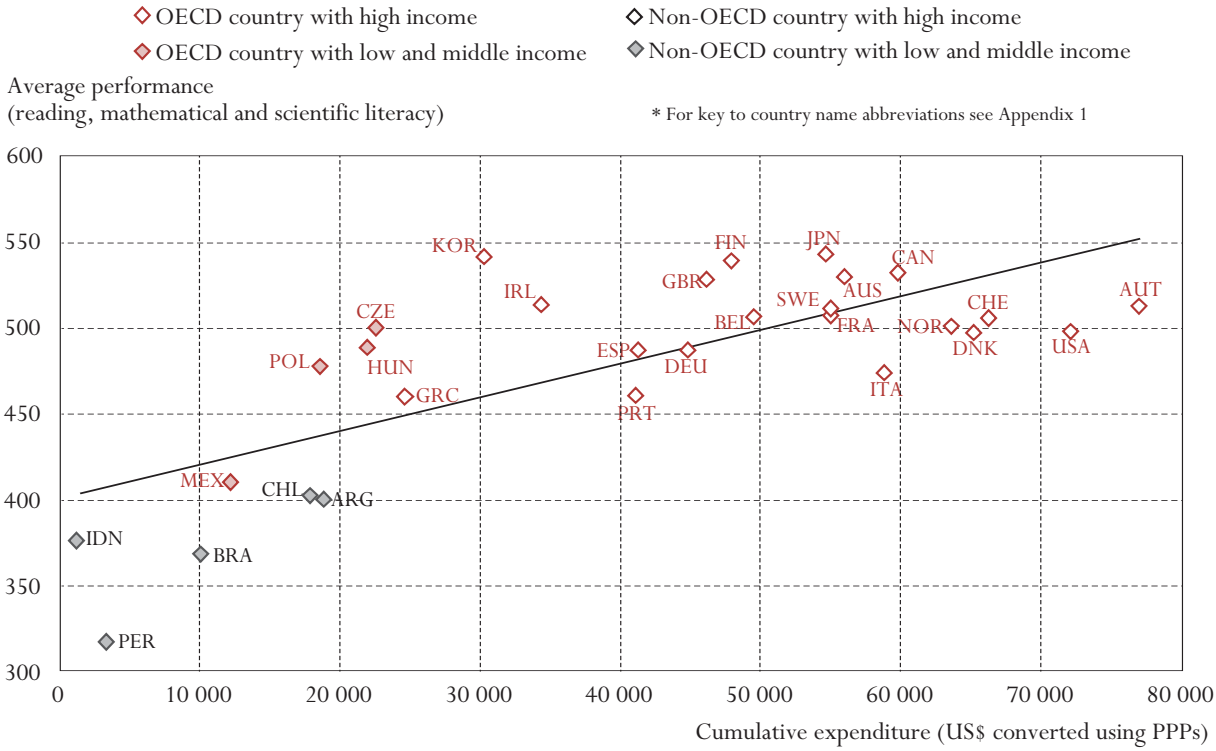
See Tables 1.4 and 3.3 in the report

While GDP provides a measure of a country's ability to pay for education, it does not directly measure the financial resources actually invested in education. PISA therefore also compared the average amount of money that countries spend per student from the beginning of primary education up to the age of 15 with average student performance across the three assessment domains. Figure 3 shows a positive relationship between spending per student and mean country performance averaged across the three assessment domains. As expenditure per student on educational institutions increases, so also does a country's mean performance, with expenditure per student explaining 54 per cent of the variation between countries in mean performance.

See Table 3.3 in the report

Figure 3 Student performance and spending per student

Relationship between average performance across the combined reading, mathematical and scientific literacy scales and cumulative expenditure on educational institutions up to age 15 in US$, converted using purchasing power parities (PPPs)



Source: OECD PISA database, 2003. Table 3.3.

Modest spending per student, however, cannot automatically be equated with poor performance of education systems. Italy spends about twice as much per student as Korea but, whereas Korea is among the best performing countries in all of the three literacy domains, Italy performs significantly below the OECD average.

Many similar exceptions to the overall relationship between spending per student and student performance suggest that, as much as spending on educational institutions is a necessary prerequisite for the provision of high-quality education, spending alone is not sufficient to achieve high levels of outcomes. This becomes most apparent in the Latin American countries and Indonesia. Expenditure per student in these countries is comparatively low but spending levels alone cannot explain their poor performance levels. In these countries, the performance of students lags considerably behind what spending per student would predict. While PISA does not provide insights into the underlying nature of the relationship, the data suggest that other factors, including the effectiveness with which resources are used, may play a crucial role.

THE IMPACT OF GENDER

Recognising the impact that education has on participation in the labour market, occupational mobility and the quality of life, all countries emphasise the importance of reducing educational disparities between males and females. Significant progress has been achieved in reducing the gender gap in educational attainment. Younger women today are far more likely to have completed a tertiary qualification than women 30 years ago. In 13 of the 30 OECD countries with comparable data, more than twice as many women aged 25 to 34 have completed tertiary education as women aged 55 to 64 years. Furthermore, university-level graduation rates for women now equal or exceed those for men in 17 of the 30 OECD countries and in all but one of the non-OECD countries for which comparable data are available.

Nevertheless, in certain fields of study, gender differences in tertiary qualifications remain persistently high. International studies have indicated that relatively small gender differences in favour of males in mathematics and science performance in the early years of schooling become more pronounced and pervasive at higher grade levels in many countries.

To shed light on these issues, PISA analysed gender differences in three areas:

Academic performance. As Figure 4 shows, in every country females, on average, reach higher levels of performance in reading literacy than males – with an overall difference of 32 points, or almost half of one proficiency level. In mathematics, however, males tend to perform at somewhat higher levels in most countries, with an average gap of 11 points. In scientific literacy there are fewer differences between males and females – with males doing better in three countries, females better in six countries and 33 showing no statistically significant gender differences.

See Table 5.2a in the report

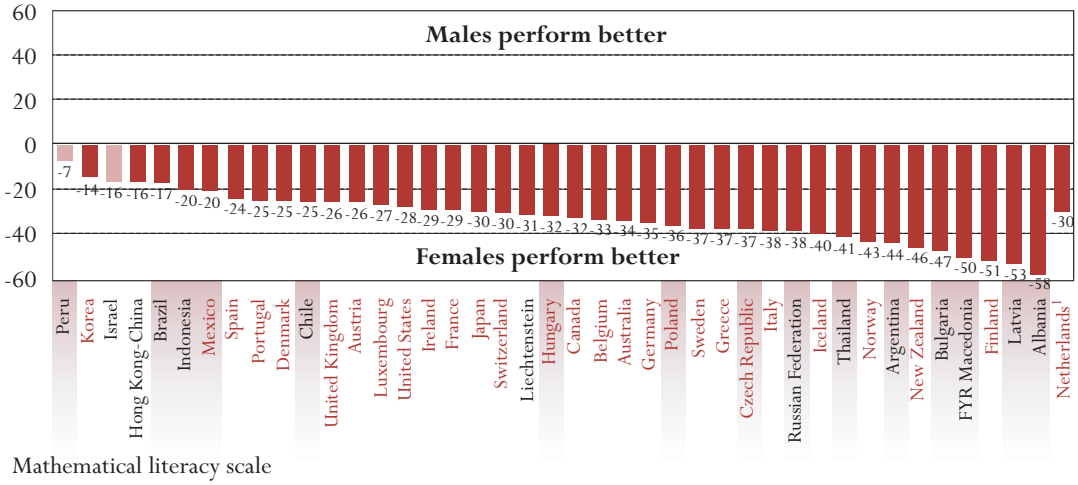
Occupational choice. Female students are more likely than males to report expected occupations related to life sciences and health as well as teaching, whereas male students more often expect careers associated with physics, mathematics or engineering or occupations related to machinery.

Professional aspirations. PISA classified students' expected professions at age 30 into four socio-economic categories, from low-skilled blue-collar to high-skilled white collar. Results showed that in 40 of the 42 countries females seem to have higher expectations toward their future occupations than males by expecting a white-collar occupation.

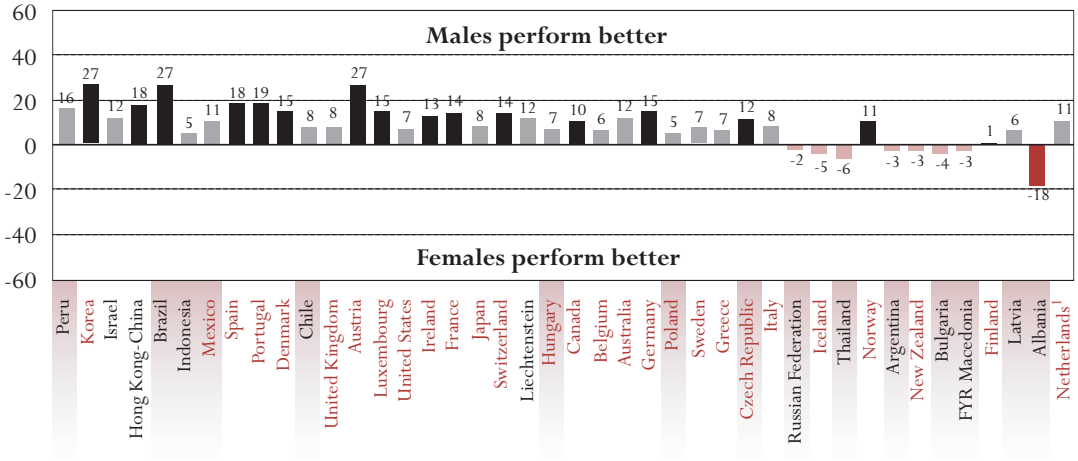
See Table 5.1 in the report

Figure 4 Gender differences in student performance

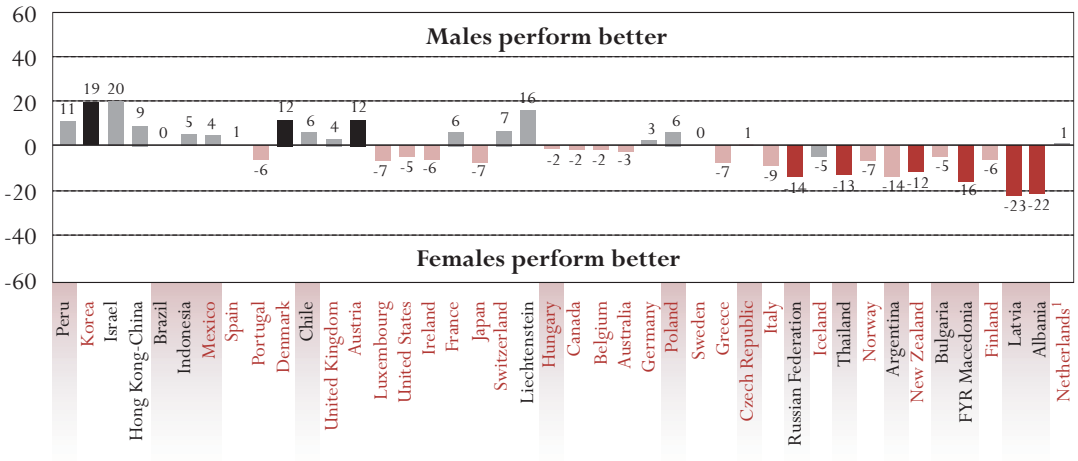
Combined reading literacy scale



Mathematical literacy scale



Scientific literacy scale



1. Response rate is too low to ensure comparability (see Annex A3).
Statistically significant differences are marked in black and dark red.
Source: OECD PISA database, 2003. Tables 4.10, 4.11, 4.12 and 4.13.

Beyond these general patterns, there is wide variation in the size of the gender gap across countries. In reading literacy gender differences range from 20 score points or less in Brazil, Indonesia, Israel, Hong Kong-China, Korea, Mexico and Peru to 50 points or more in Albania, Finland, Latvia and FYR Macedonia. In mathematical literacy they range from 18 score points favouring females in Albania, not statistically significant differences in 25 of the 42 participating countries to 27 score points favouring males in Austria, Brazil and Korea. The evidence from those countries where gender differences are not large may be that effective policies and practices can overcome what were long taken to be the inevitable outcomes of differences between males and females in learning style – and even in underlying capacities. Indeed, the results make clear that some countries provide a learning environment or broader context that benefits both genders equally. The enduring differences in other countries, as well as the widespread disadvantage now faced by young males in reading literacy, require serious policy attention.

See Table 5.2a in the report

Looking beyond differences in the average performance of males and females, males are more likely than females to be among the lowest performers in reading literacy in all countries. While males tend to perform better than females overall in mathematics, much of the difference is attributable to the disproportionate number of males among the better students, not to a relative absence of males among the poorer performers. Thus underachievement of young men, especially in reading, is a significant challenge for education policy.

Gender differences in reading performance are closely mirrored in reading habits. For example, 58 per cent of males but only 33 per cent of females report that they read only to get the information they need. While 45 per cent of females, but only 30 per cent of males, report spending at least 30 minutes a day reading for pleasure. These data suggest that many education systems have not been able to sufficiently engage students, particularly males, in reading activities. The close interrelationship between subject interest and learning outcomes also suggests that the differing habits and interests of young females and males have far-reaching consequences for learning, and that education policy needs to address these consequences. Improving the level of engagement of males in reading activities, and stimulating interest and self-concept among females in mathematics, need to be major policy objectives if greater gender equality in educational outcomes is to be achieved.

See Tables 5.5 and 5.7 in the report

THE IMPACT OF ENGAGEMENT ON LEARNING

Most children come to school ready and willing to learn. How can schools foster and strengthen this predisposition and ensure that young adults leave school with the capacity to continue learning throughout life? Students need effective approaches to learning both to succeed at school and to meet their learning needs later in life. In particular, they need to regulate the learning process, taking responsibility for reaching particular goals. These types of outcomes are not pursued as a specific part of the curriculum, yet they can be strongly influenced by students' experiences at school and play a crucial part in their future. To address this, PISA also looked at student approaches to learning. Specifically, it examined the way students handle and address learning tasks in school and the extent to which they are able to identify and pursue their own learning goals by applying strategies and drawing on their motivation.

Regarding study habits, the average difference in reading scores between those who reported that they "almost always" study as hard as possible and those reporting that they "almost never" do was 13 points in OECD countries. In Brazil, Bulgaria, Denmark, FYR Macedonia and Hong Kong-China the gaps ranged from 61 to 73 points. Data also show that the difference in reading performance between those students who reported not skipping class and those who reported doing so five times or more was 75 score points or more in 11 countries including Argentina, Chile and Thailand.

See Tables 4.2 and 4.3 in the report

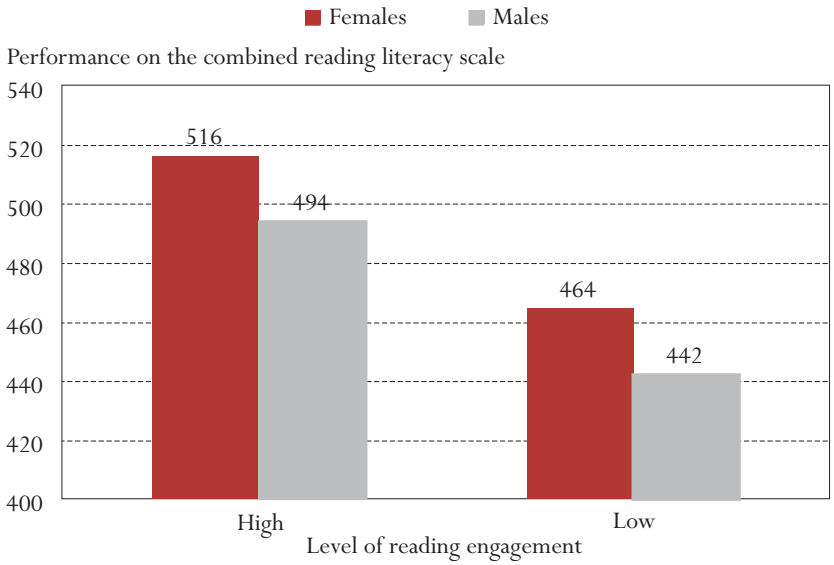
The development of control strategies, whereby students selectively process, monitor and organise information, is positively related to student performance in all countries, although a causal relationship cannot be established. Likewise, there is a strong positive association between elaboration strategies, whereby students relate material to things learned in other contexts, and academic performance in all countries except Belgium, Israel, Netherlands and the United States. The results show that those most likely to memorise information do not always achieve the best results, while those who process or elaborate what they learn do well.

Students who spend more time reading for pleasure, read more varieties of materials and show more positive attitudes towards reading tend to be better readers, regardless of their family background and the wealth level of the country that they are from. Students who are among the least diversified readers have, on average, the lowest mean scores; while students who are the most diversified readers have higher mean scores

See Table 4.11 in the report

Gaps in reading scores attributable to different levels of reading engagement are far greater than the reading performance gaps attributable to gender. Although females generally score higher than males in reading, male students who are more engaged in reading tend to outperform female students who are less engaged in reading (see Figure 5). Such results suggest that reading engagement is an important factor that distinguishes between high-performing and low-performing students, regardless of their gender.

Figure 5 Expected performance for males and females with different levels of engagement in reading but the same family characteristics



Source: OECD PISA database, 2003.

Fifteen-year-olds whose parents have the lowest occupational status but who are highly engaged in reading achieve better reading scores than students whose parents have high or medium occupational status but who are poorly engaged in reading. All students who are highly engaged in reading achieve reading literacy scores that, on average, are significantly above the OECD mean, whatever their parents' occupational background. This suggests that student engagement in reading may be an important policy lever to counter social disadvantage.

These results should not be taken as evidence of the causal relationship between reading engagement and reading performance. Reading engagement and reading performance may be mutually reinforcing. In this sense, an important policy tool is to encourage schools and parents to cultivate good reading habits in students.

THE IMPACT OF FAMILY BACKGROUND

Home background influences educational success, and socio-economic status may reinforce its effects. Although PISA shows that poor performance in school does not automatically follow from a disadvantaged socio-economic background, it appears to be one of the most powerful factors influencing performance on the reading, mathematical and scientific literacy scales.

PISA examined the relationship between student family background and literacy performance both in terms of the impact of background characteristics on individual students and the overall situation in participating countries.

While PISA consistently shows a relationship between advantaged family backgrounds and higher levels of literacy performance for students in every country, the patterns of this influence varied both within and between countries. Analysis covered the following areas:

Parental occupational status. The effects of parental occupational status on literacy performance differ across countries. Differences in reading scores between students in the top and bottom quarters on the international socio-economic index of occupational status range from less than 50 points in Hong Kong-China, Korea and Thailand to more than 110 points in Germany and Switzerland. In half of the non-OECD countries, these differences are either equal to, or larger than, 81 points, which is the average difference for OECD countries as a whole.

See Table 6.1a in the report

Family wealth. In every country except Albania and Iceland, students from wealthier families on average tend to have higher reading scores. For non-OECD countries, the gaps in reading scores between the top and bottom quarters of the index of family wealth range from 16 points in Latvia and FYR Macedonia to 91 points in Argentina.

See Table 6.2 in the report

Possessions related to "classical" culture. PISA assessed the extent to which students come from homes where cultural possessions such as classic literature and works of art are present and how this factor related to achievement. The differences in mean scores on the combined literacy scale between the top and bottom quarters of the national index of cultural possessions range from 10 and 12 points in Indonesia and Thailand to 100 points in Luxembourg. The gaps associated with cultural possessions are smallest in the five Asian countries (less than 52 points).

See Table 6.3 in the report

Parental education. In all countries students whose mothers have completed upper secondary education (ISCED3) have higher levels of performance in the three domains of literacy than students whose mothers have not completed upper secondary education. Nevertheless, in Hong Kong-China the mean reading score of students with the least educated mothers is higher than the mean scores of students whose mothers have completed upper secondary or even tertiary education (ISCED5/6) in all the other non-OECD countries except Liechtenstein.

See Table 6.4 in the report

Communication with parents on social issues and aspects of culture. PISA surveyed students on how often they interacted or communicated with their parents in three cultural areas (discussing political or social issues; discussing books, films or television programmes; and listening to music together) and in three social areas (discussing how well the student was doing in school; eating the main meal with the student; and spending time just talking). Results show that students who report more frequent interaction with their parents on both cultural and social issues tend to perform better on the

combined reading literacy scale in every country. Social communication is closely related to reading scores in most non-OECD countries, while cultural communication is closely related in most OECD countries. (See Tables 6.5 and 6.6 in the report)

See Tables 6.5 and 6.6 in the report

Family structure. Since single-parent families on average have lower income than two-parent families and must cope with the double responsibility of work and child-rearing, it may be more challenging for them to provide and maintain a supportive learning environment for the children. The relative performance in reading literacy of students from single-parent families is mixed. In OECD countries students from single-parent families have reading scores that are on average 12 points lower than students from other types of families. In non-OECD countries the same pattern holds in Hong Kong-China, Israel, Liechtenstein and Latvia. In the remaining non-OECD countries, however, students from single-parent families have roughly similar levels of reading literacy as students from other types of families.

See Table 6.7 in the report

To determine how various background characteristics interact and relate to student performance an index was constructed to summarise parents' occupational status and years of schooling as well as family wealth, home educational resources and possessions related to "classical" culture. As expected, students from advantaged socio-economic backgrounds tend to have higher reading scores than students from disadvantaged backgrounds.

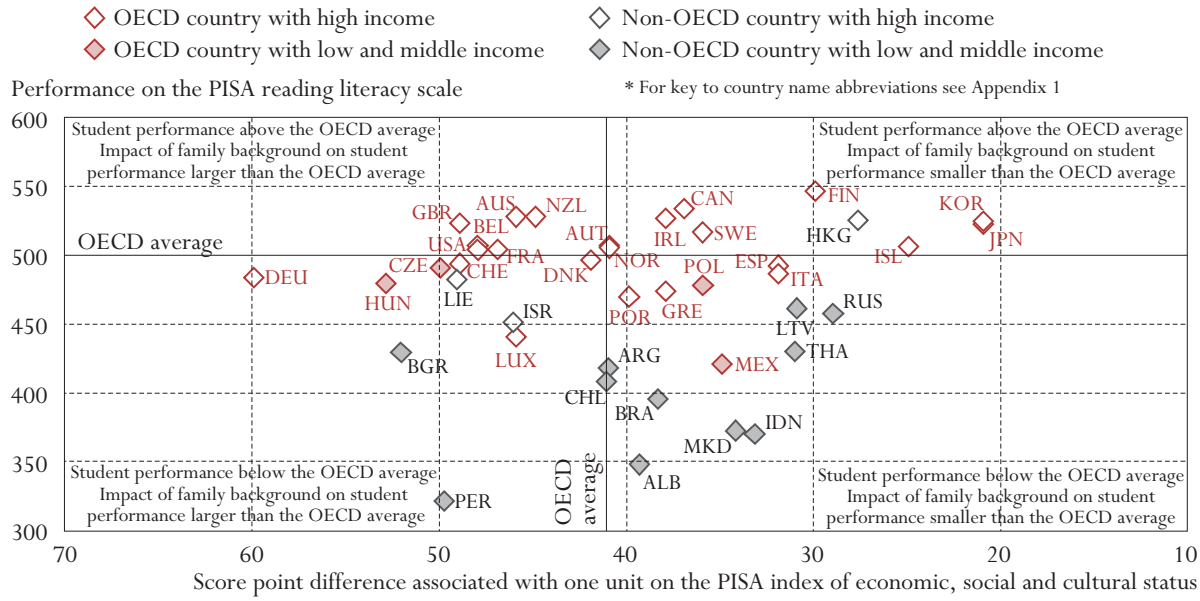
More importantly, while all countries show a clear positive relationship between home background and educational outcomes, some countries demonstrate that high average quality and equality of educational outcomes can go together: Canada, Finland, Hong Kong-China, Iceland, Japan, Korea and Sweden all display above-average levels of student performance on the combined reading literacy scale and, at the same time, a below-average impact of economic, social and cultural status on student performance (see Figure 6, top-right quadrant). Conversely, average performance in reading literacy in the Czech Republic, Germany, Hungary and Luxembourg is significantly below the OECD average while, at the same time, there are above-average disparities between students from advantaged and disadvantaged socio-economic background (see Figure 6, bottom-left quadrant).

See Table 6.11 in the report

The finding that some countries are able to achieve high levels of performance while reducing disparities is encouraging. Showing that countries differ not just in their mean performance but also in the extent to which they are able to close the gap between the students with the lowest and the highest levels of performance offers encouragement to national policy-makers seeking to provide equal opportunities and equitable learning outcomes for all students.

Figure 6 Average level of reading performance and inequity related to students' socio-economic background

Relationship between the average performance of countries on the PISA reading literacy scale and the socio-economic distribution of student performance



Source: OECD PISA Database, 2003, Tables 2.3a and 6.10.

Results also showed that for many countries, when adjusting for students' socio-economic backgrounds, their average reading scores would be higher than their actual performance. This is particularly true in many poorer countries that perform below the OECD average. Such results suggest that the lower levels of student performance in reading literacy in these countries are partly attributable to students' overall lower socio-economic status. In general, the performance gap associated with students' socio-economic background seems relatively moderate in Asian and Scandinavian countries but quite pronounced in Germany and several Central and Eastern European countries.

THE IMPACT OF SCHOOL CHARACTERISTICS

Student performance is shaped not only by the individual characteristics and family backgrounds that they bring to the learning process but also by the resources, admissions policies and approaches to learning that characterise the schools they attend.

This represents a significant challenge for public policy, which strives to provide learning opportunities for all students irrespective of their home backgrounds. National research evidence from some countries has often been discouraging. Schools have appeared to make little difference. Either because privileged families are better able to reinforce and enhance the effect of

schools, or because schools are better able to nurture and develop young people from privileged backgrounds, it has often been apparent that schools reproduce existing patterns of privilege rather than delivering equal opportunities in a way that can distribute outcomes more equitably.

PISA underlines the fact that a student's home background is only part of the story of socio-economic disparities in education – and in most countries the smaller part. The combined impact of the school's socio-economic composition can have an appreciable effect on the student's performance, and generally has a greater effect on predicted student scores than the student's own family characteristics. In fact, in about one third of all PISA countries, the impact of the school-level effects are greater than the impact of student-level characteristics.

Another key finding is that beneficial school effects are reinforced by socio-economic background. Schools with more resources and policies and practices associated with better student performance tend, to varying degrees, to have more advantaged students. The net result of this effect is that in countries where there is a high degree of segregation along socio-economic lines, students from disadvantaged socio-economic backgrounds do worse. This, in turn, means that some of the *inequality of outcomes* observed in the analysis of socio-economic gradients is associated with *inequality of opportunity*. In such circumstances, talent remains underdeveloped and human resources are wasted.

In some countries, students are highly segregated along socio-economic lines, in part because of residential segregation and economic factors, but also because of features of the education system. Education policy in such countries might attempt to moderate the impact of socio-economic background on student performance by reducing the extent of segregation along socio-economic lines, or by allocating resources to schools differentially. In these countries, it may be necessary to examine how the allocation of school resources relates to the socio-economic composition of schools. In other countries, there is relatively little socio-economic segregation, i.e., schools tend to be similar in their socio-economic composition. Education policy in these countries might aim at moderating the impact of socio-economic background through measures aimed at improving school resources and reducing within-school segregation according to students' economic, social and cultural status. In the end, of course, what matters most is how effectively resources are used. Approaches might include, for example, eliminating classroom streaming or providing more assistance for students with a poor level of performance.

In countries where the impact of socio-economic background on student performance is moderate, not all successes can be credited to the education system and, in countries where the impact is considerable, not all of the problems should be attributed to schools either. The analysis shows that the challenges which education systems face as a result of the differences in the distribution of home background factors among the student population differ

widely. Many of the factors of socio-economic disadvantage are not directly amenable to education policy, at least not in the short term. For example, the educational attainment of parents can only gradually improve, and family wealth will also depend on long-term national economic development.

PISA results suggest that school policy and schools themselves can play a crucial role in moderating the impact of social disadvantage on student performance. The results reveal some school resource factors, school policies and classroom practices that appear to make a significant difference to student performance. The extent to which students make use of school resources, and the extent to which specialist teachers are available, can both have an impact on student performance. According to principals' perceptions of teacher-related factors affecting school climate, teacher morale and commitment, and school autonomy, also appear to make a difference. Finally, there are aspects of classroom practice that show a positive relationship with student performance, such as teacher-student relations and the disciplinary climate in the classroom.

There is no single factor that explains why some schools or some countries have better results than others. Successful performance is attributable to a constellation of factors, including school resources, school policy and practice, and classroom practice. It will require much further research and analysis to identify how these factors operate, interact with home background, and influence student performance.

In pursuit of this deeper understanding, a series of thematic PISA reports will analyse the impact of school and system-level factors on student performance more extensively, and will seek to understand in more detail why some countries achieve better and more equitable learning outcomes than others. In the meantime, the mere fact that high-quality learning outcomes are already a reality for most students in some countries is, in itself, an encouraging result that shows that the challenges ahead can be tackled successfully.

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Appendix 1

Country names have been abbreviated in Figures 3 and 6 using the International Standards Organisation (ISO) three-digit alphanumeric as following:

OECD MEMBER COUNTRIES

AUS	Australia	KOR	Korea
AUT	Austria	LUX	Luxembourg
BEL	Belgium	MEX	Mexico
CAN	Canada	NLD	Netherlands
CZE	Czech Republic	NZL	New Zealand
DNK	Denmark	NOR	Norway
FIN	Finland	POL	Poland
FRA	France	PRT	Portugal
DEU	Germany	SVK	Slovak Republic
GRC	Greece	ESP	Spain
HUN	Hungary	SWE	Sweden
ISL	Iceland	CHE	Switzerland
IRL	Ireland	TUR	Turkey
ITA	Italy	GBR	United Kingdom
JPN	Japan	USA	United States

NON-OECD MEMBER COUNTRIES[1]

ALB	Albania	MKD	FYR Macedonia
ARG	Argentina	LVA	Latvia
BRA	Brazil	LIE	Liechtenstein
BGR	Bulgaria	PER	Peru
CHL	Chile	ROM	Romania
HKG	Hong Kong-China	RUS	Russian Federation
ISR	Israel	THA	Thailand
IDN	Indonesia		

1 For simplicity of expression, the term "country" is used in this report to refer to either a sovereign state or a territory.