



International large-scale assessments: Origins, growth and why countries participate in PISA

This chapter describes the origins of international large-scale assessments, presents evidence regarding the worldwide growth in such assessments, and analyses the broad determinants of participation in the Programme for International Student Assessment (PISA). It links PISA participation with countries' economic status and their experience with national and other international large-scale assessments. The empirical analyses presented in the second section of this chapter use selected time-series data for over 200 countries/economies to empirically estimate the determinants of PISA participation. The third section examines country-by-country variations in PISA participation over time. The fourth section draws on interviews with various policy actors to explore the PISA experience of selected low- and middle-income case study countries. A final section draws conclusions about what factors contribute to a country's decision to participate in PISA and implications for the expansion of PISA participation.

ORIGINS OF INTERNATIONAL LARGE-SCALE ASSESSMENTS

Fifty-five years ago, a group of scholars from Western Europe and North America met at the United Nations Education, Science and Culture Organization (UNESCO) Institute for Education in Hamburg, Germany, to explore the feasibility of an international study of educational achievement. Twelve countries, nine high-income and three upper-middle-income, participated in what was later referred to as the International Association for the Evaluation of Educational Achievement (IEA) Pilot Study.¹ These countries were: Belgium (French Community), England, Germany, Finland, France, Israel, Poland, Scotland, Sweden, Switzerland, the United States and Yugoslavia (Husen, 1967; Keeves, 2011). As Keeves noted: “The Pilot Study established that a cross-national investigation was feasible in spite of the problems of translation and administration.” This conclusion has underpinned the remarkable rise of international large-scale assessments over the past five decades, despite the gradual inclusion of countries that dramatically differ in terms of economy and culture from those initial twelve countries.

Lower income countries in international large-scale assessments, 1960s-90s

Low- and middle-income countries² began to participate in international assessments in the early 1970s. The IEA Pilot Study was followed in 1964 by IEA’s First International Mathematics Study in which twelve high-income countries participated: Australia, Belgium (both Flemish and French Communities), England, Germany, Finland, France, Israel, Japan, Netherlands, Scotland, Sweden and the United States (Husen, 1967). In 1970-71, up to 19 countries participated in IEA’s Six-Subject Study, covering the domains of science, reading, literature, French as a foreign language, English as a foreign language and civic education. For the first time, participating countries included six low- or middle-income countries: Chile, Hungary, India, Iran, Romania and Thailand.

A decade later, IEA’s Second Mathematics Study was initiated, with four low- or middle-income countries participating: Hungary, Nigeria, Swaziland and Thailand (Robitaille and Garden, 1989). In 1983-85, IEA’s Second Science Study was carried out, with eight low- or middle-income countries participating: three provinces of the People’s Republic of China (hereafter ‘China’), Ghana, Hungary, Nigeria, Papua New Guinea, Philippines, Thailand and Zimbabwe (Postlethwaite and Wiley, 1992). In 1988, Educational Testing Service carried out its International Assessment of Educational Progress (IAEP) in 6 countries, and repeated the exercise in 1991 in 20 countries, including 5 low- or middle-income countries: Brazil, China, Hungary, Jordan and cities in Mozambique (Lapointe, Askew and Mead, 1992; Lapointe, Mead, and Askew, 1992; Lapointe, Mead, and Phillips, 1989). In 1990-91, IEA’s Reading Literacy Study was carried out, with 8 low- or middle-income countries participating: Botswana, Hungary, Indonesia, Nigeria, Philippines, Thailand, Venezuela and Zimbabwe (Elley, 1992). Thus, as of a quarter-century ago, 19 low- and middle-income countries from all world regions had already participated in one or more international large-scale assessment.

Throughout the 1990s, low- and middle-income countries continued to participate in international large-scale assessments: 9 in IEA’s Third International Mathematics and Science Study (TIMSS) of 1995 (Beaton, Martin, et al., 1996; Beaton, Mullis, et al., 1996; Martin et al., 1997; Mullis et al., 1997) and 17 in IEA’s renamed Trends in International Mathematics and Science Study (also TIMSS) of 1999 (Martin et al., 2000; Mullis et al., 2000). In Latin America, 16 countries participated in the *first Estudio Regional Comparativo y Explicativo* (Regional Comparative and Explanatory Study, or PERCE) of 1998 organised by UNESCO’s *Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación* (Latin American Laboratory for the Evaluation of Educational Quality, or LLECE) (Ferrer, 2006). In Southern Africa, seven countries joined the Southern African Consortium for Measuring Educational Quality’s (SACMEQ) first assessment of 1997 (Makuwa and Maarse, 2013), and in Francophone Africa, the *Programme d’Analyse des Systèmes Educatif de CONFEMEN* (PASEC) exercise was underway in eight countries.³ By the end of the 20th century, nearly 40 low- or middle-income countries had participated in one or more international or regional large-scale assessment.

Additional countries and assessments, 2000-15

The first decade of the new millennium saw an explosion of interest in international large-scale assessments, including greater participation among low- and middle-income countries:

1. OECD’s initial PISA of 2000 (with 7 low- and middle-income countries).
2. PISA 2000 Plus of 2001 (with 8 low- and middle-income countries).
3. IEA’s Progress in Reading Literacy Study (PIRLS) of 2001 (16 low- and middle-income countries).
4. SACMEQ II of 2000-2004 (7 low- and middle-income countries).
5. PISA 2003 (14 low- and middle-income countries).
6. TIMSS 2003 (19 low- and middle-income countries).
7. PIRLS 2006 (16 low- and middle-income countries).



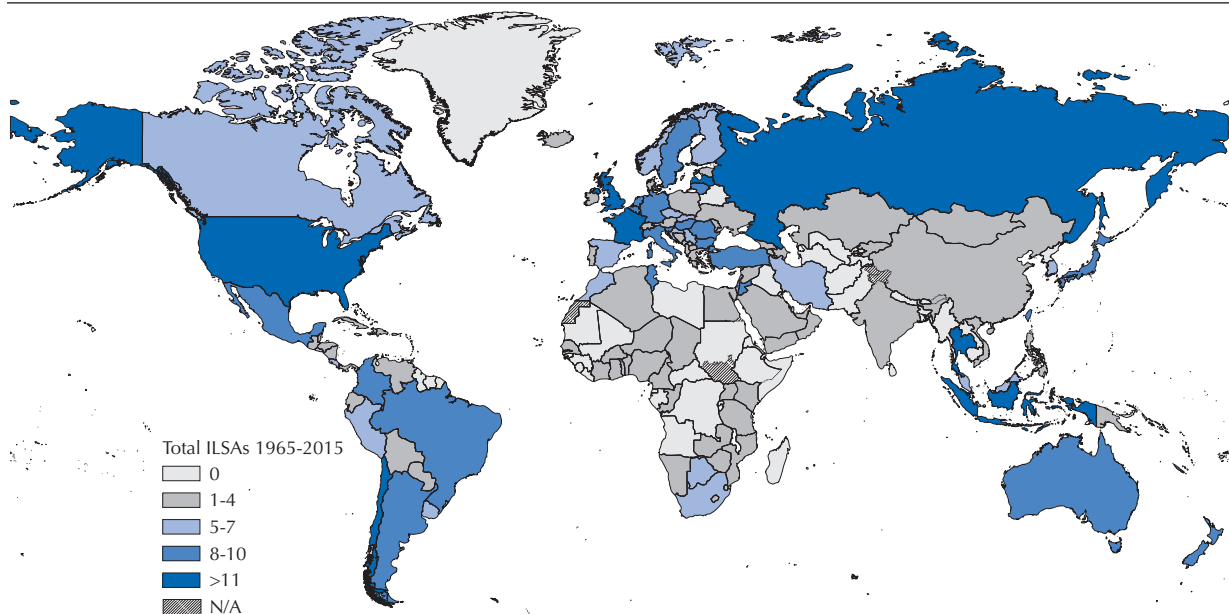
8. PISA 2006 (26 low- and middle-income countries).
9. SACMEQ II of 2006-2011 (14 low- and middle-income countries).
10. Second Regional Comparative and Explanatory Study (SERCE) 2006 (16 low- and middle-income countries).
11. TIMSS 2007 (34 low- and middle-income countries).
12. PISA 2009 and PISA 2009 Plus⁴ (34 low- and middle-income countries).


Despite this increase, a very small share of the more than 150 low- and middle-income countries with populations greater than 30 000 participated in these studies. Approximately 22% participated in each of the two major international assessments – PISA 2009/PISA 2009 Plus and TIMSS 2007 – although somewhat different countries participated in the two assessments. Participation rates in regional assessments were higher: 52% of the 31 low- and middle-income Latin American countries participated in SERCE 2006 and 29% of the 48 Sub-Saharan African countries participated in SACMEQ II. In a few cases, countries began participation, often with the support of donors, but either did not complete the assessment or did not report their results internationally.

However, participation in international large-scale assessments has swelled over recent decades. Figure 2.1 shows the number of countries participating in any international large-scale assessment, from 1960 to 2015. The number of participating countries is indicated by ranges from 0 to 13, with the larger number suggesting a sustained assessment culture. The next section of this chapter examines some reasons that low- and middle-income countries participate in international large-scale assessments, with particular reference to PISA.

— Figure 2.1 —

Participation in international large-scale assessments (ILSA), 1965-2015



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PISA PARTICIPATION, 2000-15, EMPIRICAL ESTIMATES

Since the first cycle of PISA, the number of countries participating in the assessment has increased by about two-thirds (OECD, 2001, 2004, 2007, 2010, 2014; Walker, 2011). A similar growth in the number of countries participating in other large-scale assessments also occurred over this time period. This increase is largely related to long-standing needs for better education indicators to inform policy. As the United States National Research Council observed in the early 1990s, “The lack of an adequate system of education indicators to inform education policy making has become increasingly apparent” (National Research Council, 1993 as cited in Chabbot and Elliott, 2003). A decade later, Chabbot and Elliott identified PISA specifically as an “indicator” study and observed that a continuing rationale for international studies in education, including large-scale assessments, is to “expand understanding of education as a social and economic institution” (Chabbot and Elliott, 2003).

Lockheed (2013) has argued that another reason for PISA's expansion is the assessment's association with the OECD and the demand generated by economists for valid and reliable cross-national indicators of human capital. As the economist Wößmann notes: "A central pre-requisite for conducting cross-country empirical research is the availability of internationally comparable data. Thus, when investigating the relationship between human capital and the level of economic development across countries, it is crucial to have a reliable measure of human capital which is comparable across countries" (Wößmann, 2002).

Meyer and Benavot (2013) have argued that the rise of PISA is a manifestation of the globalisation of education, broadly, and of educational assessment, specifically. Others have suggested that the growth is due to a largely European regional "peer effect." PISA's growth has also benefitted from the growth in international assessment capacity generally, fuelled in part by previous international and regional assessments and the capacity development activities undertaken as part of both international and national assessments (Kellaghan and Greaney, 2001; Lockheed, 2013).

The OECD acknowledges that the expansion of PISA can be explained by many factors and also accepts that the results of the assessment can be used for several purposes. However, it is important to note that the design, development and implementation of PISA is under the exclusive responsibility of the ministries of education of the participating countries.

Methodology

This chapter tests some of these notions empirically, using a data set covering 214 countries/economies as of 2014 (Lockheed, 2015a). Time series data on country economic status, 1997-2015 (using the four World Bank categories of low-income, lower-middle-income, upper-middle-income and high-income), are matched with information regarding region (East Asia and Pacific, Europe and Central Asia, South Asia, Sub-Saharan Africa, Latin America and the Caribbean, North America, and the Middle East and North Africa), OECD membership, PISA participation, prior participation in IEA's TIMSS,⁵ participation in regional assessments (LLECE's PERCE, SERCE and Third Regional Comparative and Explanatory Study [TERCE] in Latin America, three rounds of SACMEQ in Southern Africa, and the most recent PASEC in 2014), and conducting national assessments.⁶ Regrettably, complete time-series data on contextual factors, such as the political economy of all these countries, is not available and therefore not included in this analysis.

All countries⁷ are included; the assumption is that all countries could have participated in up to six cycles of PISA. The unit of analysis, therefore, is the "country-PISA cycle" or, in aggregate, "participations." Some countries are represented by subnational units only (states, provinces, special administrative regions). This analysis describes some characteristics of the countries that participate in PISA, providing some clues about the determinants of PISA participation.

Increased PISA participation in upper-middle-income and high-income countries

Participation in PISA – defined as completing the assessment and contributing to the international report – has increased from 44 countries/economies in 2000 to 63 countries/economies in 2012, with 74 countries/economies currently participating in the 2015 assessment.⁸ Country-level participation appears to have plateaued at around 70 countries/economies. At the same time, the absolute number of participating low- and middle-income countries/economies has increased but has fluctuated considerably over time: 15 in 2000-01, 14 in 2003, 26 in 2006, 34 in 2009-10, 23 in 2012, and 26 in 2015. The OECD reports that several new middle-income countries have confirmed their intention to participate in PISA 2018.

What matters for participation in PISA?

Participation is higher for wealthier countries, countries in Europe and North America, and countries with an established assessment culture, as indicated by evidence of their prior participation in an international large-scale assessment or national assessment.

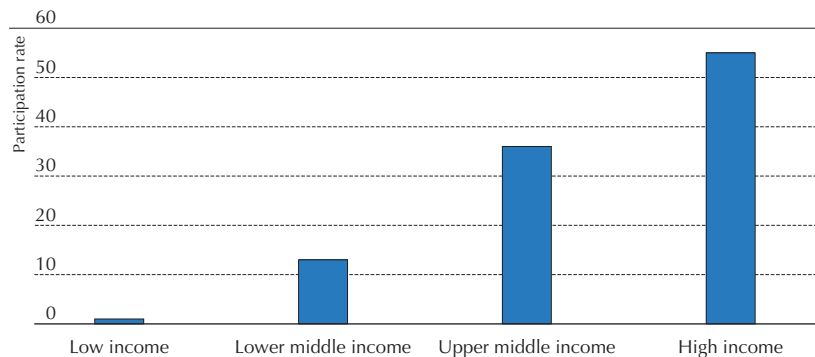
National wealth matters

The costs associated with PISA participation are more affordable to higher-income countries: 86% of all PISA participations (that is, the total participations across six PISA cycles) come from high-income and upper-middle-income countries, with the overall PISA participation rate⁹ of OECD countries (96%) significantly higher than that of non-OECD countries (14%). Moreover, the overall participation rate increases dramatically by income group: the participation rates of high-income countries (55%) and upper-middle-income countries (36%) are substantially higher than those of lower-middle-income countries (13%) and of low-income countries (1.5%). Since 2000, only four countries have participated in PISA at the time they were classified as low-income economies (Albania, India [two states only], Indonesia and Kyrgyzstan).



Figure 2.2

PISA participation rate, by country economic status, 2000-15



Source: Lockheed (2015b), "PISA for Development? The Experiences of Middle-income Countries Participating in PISA", paper presented at the World Bank, June 4, 2015.

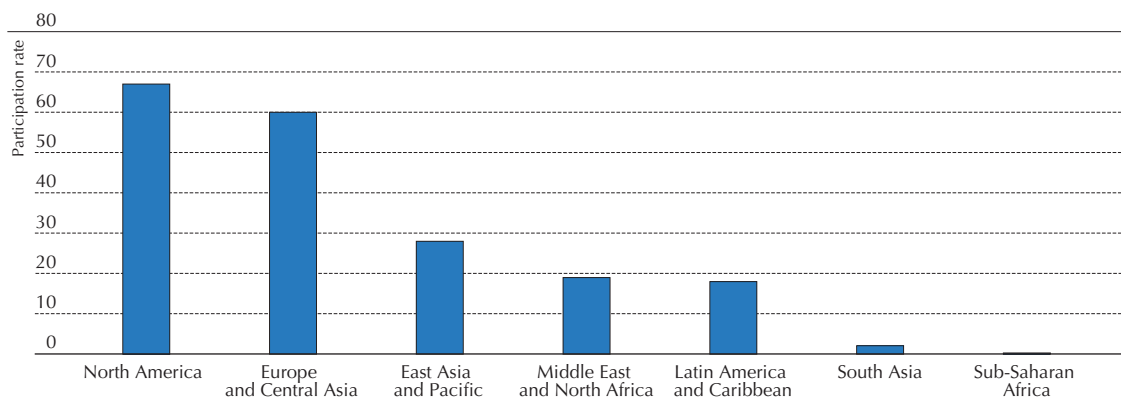
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Region matters¹⁰

PISA participation has spread outwards from OECD countries to their neighbours (Figure 2.3). The overall PISA participation rates of North American countries (67%) and countries in Europe and Central Asia (60%) are higher than participation rates of countries in other regions, with Sub-Saharan Africa recording the lowest participation rate (less than 0.5%). The inclusion of Central Asian countries in the European and Central Asia group hides the fact that the overall participation rate for European Union (EU) countries is almost 100%, whereas the participation rate of non-EU countries in the region is substantially lower.¹¹

Figure 2.3

PISA participation rate, by region, 2000-15



Source: Lockheed (2015b), "PISA for Development? The Experiences of Middle-income Countries Participating in PISA", paper presented at the World Bank, June 4, 2015.

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Experience with assessments matters

Previous experience with national or international large-scale assessments provides a solid institutional and technical foundation for participation in PISA. The PISA participation rate of countries that have conducted their own national assessments in the three years prior to participating in a PISA cycle is 43%, which is significantly higher than the 15% participation rate of those that have not recently conducted a national assessment. Similarly, the overall participation rate of countries that had participated in TIMSS within five years prior to participating in PISA (64%) is substantially

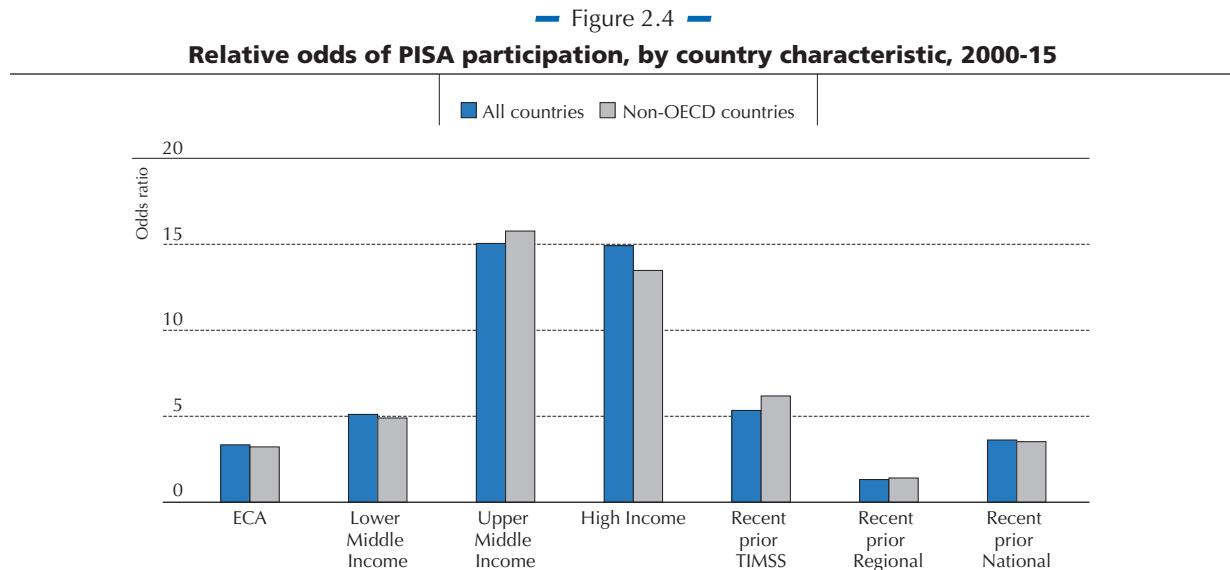
higher than that of countries that had not participated during this time (15%). This is not surprising; as Eugene Owen, the first chair of the PISA Governing Board, noted: “The stalwarts in IEA were the first countries to participate in PISA” (E. Owen, personal communication, 18 November 2014). Of the 43 OECD and non-OECD countries that participated in PISA 2000 and PISA 2000 Plus, 26 had participated in two or more IEA studies over the previous decade. Participation in a regional assessment, however, appears unrelated to PISA participation.

Odds of participation

Some of these country characteristics are correlated, such as OECD membership and location in the Europe and Central Asia region. A logistic regression approach provides the opportunity to estimate the odds of participation in any of the six PISA cycles between 2000-15, when all predictors are considered simultaneously.

Overall, the baseline odds of participation in PISA over 15 years are very low: 0.17 participations for every non-participation for all countries, and dropping to 0.02 participations for every non-participation for the low-income group.

The odds ratios reported in Figure 2.4 show the increased odds of PISA participation for each of several country characteristics, taken jointly. These characteristics are: being an OECD country, being a high- or middle-income country at the beginning of each PISA cycle, having previously participated in IEA’s TIMSS, having participated in a regional assessment, and having conducted a national assessment in the years prior to a PISA cycle. In all cases, the odds are relative to countries with the following characteristics: non-OECD, non-ECA, low-income and without prior assessment experience. The increased odds from having participated in a regional assessment are not significantly different from zero.



Source: Lockheed (2015b), “PISA for Development? The Experiences of Middle-income Countries Participating in PISA”, paper presented at the World Bank, June 4, 2015.

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Figure 2.4 summarises results for all countries and for non-OECD countries and shows the following:

1. OECD countries are 105 times more likely to participate than non-OECD, non-Europe and Central Asia low-income countries with no prior assessment experience (not shown).
2. Countries in the Europe and Central Asia region are more than three times as likely to participate as those not in the region, when other things are equal for both groups of countries. In some respects, PISA may be serving as a regional assessment for this group of countries.
3. The likelihood of participation in a PISA cycle increases according to a country’s economic status as measured during the first year of the cycle. High- and upper-middle-income countries are about 15 times more likely to participate than low-income countries, other things being equal. This underscores how participation costs act as a deterrent to participation for low- and lower-middle-income countries.



4. Countries that have participated in a recent TIMSS assessment are about five times more likely to subsequently participate in PISA compared with countries that have not recently participated in TIMSS or other assessments. The effects are somewhat greater in non-OECD countries. Prior participation in an international assessment is likely to have provided groundwork for PISA participation.
5. Countries that have conducted a national assessment within three years prior to a PISA cycle are over three times more likely to participate in PISA compared with other countries. National assessments can provide the technical and administrative foundation for participation in an international assessment.
6. Countries that have participated in a regional assessment are no more likely to participate in PISA than other countries. Regional assessments may be substitutes for international assessments, reducing the demand for the broader international comparisons while indicating an interest in learning from others that are more similar regionally and culturally.

Each of these factors are important correlates of participation in PISA and taken together explain a high share of the total variance in participation rates. Only one factor – participation in regional assessments – is not statistically significant and suggests that independent of the other variables, regional assessments do not lead to PISA participation, although they may serve as alternative indicators of system performance. This pattern of correlates is not substantially different for non-OECD countries.

VARIATIONS IN PARTICIPATION: ABSENCE AND RETURN

In general, a stable group of countries participates in PISA, neither skipping cycles nor leaving the assessment. As of 2015, ten countries have returned to PISA after skipping one or two cycles (listed in Table 2.1), and three countries that have not participated since PISA 2009/PISA 2009 Plus have confirmed their intention to participate in PISA 2018: Azerbaijan, Kyrgyzstan and Panama.¹² The countries that have returned after skipping one or two cycles include four high-income countries (Chile, Israel, Malta, and Trinidad and Tobago), five upper-middle-income countries (Albania, Argentina, Bulgaria, Former Yugoslav Republic of Macedonia [hereafter 'FYROM'] and Peru), and one lower-middle-income country (Georgia). Half of these returning countries are from the Europe and Central Asia region, underscoring that region's influence in PISA participation. The OECD considers that there is nothing wrong with a country making selective use of the PISA instruments and is flexible in responding to the cases where a country chooses to skip a cycle or returns to the assessment after a gap.

Neither a country's performance level nor change in PISA assessment performance appear to be systematically related to its decision to participate in a specific PISA cycle. All four countries that participated in PISA 2009/ PISA 2009 Plus, but did not participate in PISA 2012 and PISA 2015, performed below the OECD average in the year before dropping out, but whether or not their scores had improved or declined relative to a previous assessment does not seem to have mattered. For example, Kyrgyzstan's scores increased between PISA 2006 and PISA 2009, whereas Azerbaijan's scores declined over the same period. At the same time, many other countries with scores below the OECD average continue to participate.


— Table 2.1 —

Countries returning to PISA after skipping cycles

Country	Skipped PISA Cycle	PISA score (PISA cycle year) prior to skipping			PISA Cycle of return
		Mathematics	Reading	Science	
Argentina	2003	388 (2001)	418	396	2006
Bulgaria	2003	430 (2001)	430	448	2006
Chile	2003	384 (2001)	410	415	2006
Israel	2003	433 (2001)	452	434	2006
Albania	2003, 2006	381 (2001)	349	376	2009
Peru	2003, 2006	292 (2001)	327	333	2009
FYROM	2003, 2006, 2009, 2012	381 (2000)	373	401	2015
Trinidad and Tobago	2012	414 (2009)	416	410	2015
Georgia	2012	379 (2010)	374	373	2015
Malta	2012	463 (2010)	442	461	2015

Note: 2001 and 2010 were PISA Plus assessments.

Source: Author's analysis of OECD, 2001; OECD, 2004; OECD, 2007; OECD, 2010; OECD, 2014; Walker, 2011.

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INTERNATIONAL LARGE-SCALE ASSESSMENTS: ORIGINS, GROWTH AND WHY COUNTRIES PARTICIPATE IN PISA

Identifying why a country decides to skip a specific cycle of PISA is difficult as it may be related to any number of factors, including changes in governmental strategic directions, challenges created by the timing of a specific cycle of the assessment, or even the main domain of the assessment. The two-year gap between the PISA 2000 Plus assessment in 2001 and PISA 2003, and between PISA 2009 Plus in 2010 and PISA 2012 may have presented financial and technical challenges that influenced a country's decision regarding whether or not to participate in 2003 or 2012. Of the eight low- and middle-income countries that participated in PISA 2000 Plus, only two (Indonesia and Thailand, both with long histories of participation in international large-scale assessments) participated in PISA 2003, but four more returned for PISA 2006. Similarly, of the seven low-income and middle-income countries¹³ that participated in PISA 2009 Plus, only three (Costa Rica, Malaysia and Viet Nam) participated in PISA 2012, but five are participating in PISA 2015.¹⁴

In some cases, the focus domain for the assessments, which changes on a three-year cycle, may have been important. For example, Albania and Peru participated in PISA 2000 Plus, which focused on reading literacy. These two countries were then absent in 2003 and 2006 but returned for 2009, which also focused on reading literacy.

Governments change and their strategic directions change with them, which can result in intermittent participation, as in the case of Georgia and Trinidad and Tobago, which both skipped PISA 2012 but returned for PISA 2015.

Returning to PISA appears unrelated to education system performance. While all returnees reported scores that were lower than the OECD average, their scores were not dissimilar from those of many other participating countries.

CASE STUDIES OF MIDDLE-INCOME COUNTRIES' INITIAL PARTICIPATION IN PISA


Case studies can provide further details on why countries join PISA. Information for each case study has been compiled from the following: public documents; interviews and/or emails with World Bank and Millennium Challenge Corporation staff, and with National Project Managers; non-restricted World Bank project documents; and OECD studies. Confidentiality with respect to the interviews has been maintained, unless otherwise authorised by the interviewee.

Eight of the nine middle-income countries selected for case studies were chosen on the basis of: *i*) participation in PISA; *ii*) prior participation or non-participation in TIMSS; and *iii*) economic status. The ninth country (Kyrgyzstan) was chosen on the basis of having not participated in PISA since 2009.¹⁵ Georgia, Indonesia, Kyrgyzstan and Viet Nam are all lower-middle-income countries, while Brazil, Bulgaria, Colombia, Jordan and Turkey are upper-middle-income countries. In addition, Bulgaria is a European Union state and Turkey is a member of the OECD. Some basic education indicators for these countries are provided in Table 2.2.

— Table 2.2 —
Basic economic and education indicators, case study countries
Most recent year available

	Lower middle income				Upper middle income				
	Georgia	Indonesia	Viet Nam	Kyrgyzstan	Bulgaria	Brazil	Colombia	Jordan	Turkey
GDP (USD billions)	16.14	868.35	171.39	7.23	54.48	2 245.67	378.42	33.68	822.14
GNI-PPP (USD billions)	31.52	2 315.07	454.98	17.64	110.51	2 955.98	577.82	75.35	1 409.02
Population (millions)	4.48	246.9	89.7	5.7	7.3	198.6	48.3	6.46	74.9
Expenditure on education as % of total government expenditure	6.7	18.1	20.9	18.6	11.2	14.6	15.8	--	--
Public expenditure on education as % of GDP	1.99	3.6	6.3	6.8	4.1	5.8	4.4	--	--
Primary net enrolment rate	98.6	92.2	98.1	90.5	94.9	--	83.9	97.1	94
Secondary net enrolment rate	--	76.1	--	80.4	85.3	--	73.6	87.9	82.1

Source: World Bank EdStats (updated April 2015).

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Two-thirds of the case-study countries had experience with international large-scale assessments before they joined PISA. Both Georgia and Indonesia (among the lower-middle-income case study countries) and all countries other than Brazil (among the upper-middle-income countries) had participated in two or more international large-scale assessments prior to joining PISA. The participation of the case study countries, 1990-2015, is summarised in Table 2.3.


The experiences of the case study countries are presented below in two groups: lower-middle-income and upper-middle-income countries.



— Table 2.3 —
Case study countries' participation in international large-scale assessments, 1990-2015

International large-scale assessment	Lower middle income				Upper middle income				
	Georgia	Indonesia	Viet Nam	Kyrgyzstan	Bulgaria	Brazil	Colombia	Jordan	Turkey
IAEP 1991	-	-	-	-	-	yes	-	yes	-
IRLS 1991	-	yes	-	-	-	-	-	-	-
TIMSS 1995	-	yes	-	-	yes	-	yes	-	-
TIMSS 1999	-	yes	-	-	yes	-	-	yes	yes
PISA 2000	-	yes	-	-	yes	yes	-	-	-
PIRLS 2001	-	-	-	-	yes	-	yes	-	yes
TIMSS 2003	-	yes	-	-	yes	-	-	yes	-
PISA 2003	-	yes	-	-	-	yes	-	-	yes
PISA 2006	-	yes	-	yes	yes	yes	yes	yes	yes
PIRLS 2006	yes	yes	-	-	yes	-	-	-	-
TIMSS 2007	yes	yes	-	-	yes	-	yes	yes	yes
PISA 2009	yes	yes	-	yes	yes	yes	yes	yes	yes
PIRLS 2011	yes	yes	-	-	-	-	yes	-	yes
TIMSS 2011	yes	yes	-	-	-	-	-	yes	-
PISA 2012	-	yes	yes	-	yes	yes	yes	yes	yes
TIMSS 2015	-	-	-	-	-	-	-	yes	yes
PISA 2015	yes	yes	yes	-	yes	yes	yes	yes	yes
Total ILSAs	6	13	2	2	11	7	8	10	10

Sources: Author's analysis of Beaton, Martin et al., 1996; Beaton, Mullis et al., 1996; Elley, 1992; Lapointe et al., 1992; Martin et al., 1997; Martin et al., 2000; Mullis et al., 2000; Mullis et al., 1997; OECD, 2014; OECD, 2010; OECD, 2007; OECD, 2004; OECD, 2001; Walker, 2011.

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Lower-middle-income countries

Georgia

Georgia's participation in PISA has been encouraged and financed by donors. Georgia is a lower-middle-income country in the European and Central Asia region with an estimated population of around 5 million and a GDP of USD 16.14 billion as of 2013. It boasts near universal literacy, despite its below-average expenditure of 2% of GDP on education. It has received high marks from the World Bank for its anti-corruption measures. Both popular and political support for integration with the West has been high, albeit in flux (Cecire, 2015; World Bank, 2012).

With grant support from the World Bank (through a Development Grant Facility grant to the IEA), Georgia participated in PIRLS 2006 and TIMSS 2007; it also participated in PISA 2009, TIMSS 2011 and PIRLS 2011. Although Georgia prepared for PISA 2012, the assessment was cancelled. Georgia has re-joined PISA for 2015. Georgia had one experience of implementing a large-scale national assessment in 2004 prior to participating in these international large-scale assessments.

With project support from the World Bank, Georgia established the National Assessment and Examinations Center (NAEC) in 2002. Its founding director was a strong supporter of both fair tests and international assessments and served as national project manager for several of the previously mentioned international studies. The main responsibility of NAEC was to conduct university entrance examinations in a fair and equitable way, involving new, tightly controlled implementation procedures with a high degree of security. This reform of the university entrance examination was widely heralded as a success, and the NAEC Director was commended. In addition, NAEC assumed responsibility for conducting international large-scale assessments, and successfully completed the PIRLS, TIMSS and PISA studies between 2006 and 2011.

Although the results of PISA 2009 Plus were not broadly disseminated by the Georgian media, as shown in Chapter 5, they did appear in online blogs and forums. Moreover, results from PISA 2009 Plus were used by one donor – the Millennium Challenge Corporation – during the development of its first education grant to underscore the need for quality and equity improvements in education and to document a widening gender gap in mathematics performance favouring male students in secondary school.



Indonesia

Indonesia's participation in PISA followed its prior participation in earlier IEA studies, its own UNESCO-supported national assessment study in 1978, and its early investment in building technical capacity for educational measurement. Indonesia is a lower-middle-income country of Pacific Asia. With a population of 250 million and a GDP of USD 868.3 billion (as of 2013), its total spending on education is relatively low at 3.6% of GDP. Indonesia has participated in international assessments continuously since 1995,¹⁶ with one of the highest rates of participation overall. A grant from the World Bank, through the Development Grant Facility grant to the IEA, supported Indonesia's participation fees for PIRLS 2006 and TIMSS 2007, and a World Bank Dutch trust fund covered international participation fees for PISA 2012.

Despite not being an OECD member country, Indonesia decided to join PISA to complement its ongoing participation in the IEA studies. One interviewee noted that it joined in order to "learn from both approaches and styles." That is, by joining both the IEA studies and PISA, Indonesia "expected to have hands-on experiences and expertise in the different ways of conducting large scale assessment and to develop [its] own model of a national assessment system."

Indonesia's participation in PISA can also be linked to the country's investment in measurement capacity through overseas doctoral studies in psychometrics in the 1980s and 1990s. In the early 1990s, the Ministry of Education and Culture had an Office of Educational and Cultural Research and Development with a research staff of 236 and an annual operational and development budget of USD 7 million. Within this office was the Centre for Examination System Research and Development, headed by a PhD graduate in statistics from the University of California, Los Angeles (UCLA) (Umar, 1987), who served as the national research co-ordinator for three TIMSS cycles: TIMSS 1995, TIMSS 1999 and TIMSS 2003. Two other PhD graduates in psychometrics (Mohandas, 1996; Hayal, 1992), with expertise in test equating and item banking as well as with experience in analysing TIMSS data, later joined this department and became the national project managers for PISA 2000. Thus, by the time that Indonesia joined PISA, it had considerable experience with the operational complexities of participating in international large-scale assessments, as well as significant technical capacity in psychometrics, which may have made PISA participation more feasible. Today, the National Testing Centre of the Ministry of Education and Culture includes a unit with 22 staff working on international assessments, national assessments and examinations.

Viet Nam

Viet Nam's participation in PISA 2012 benefitted from the country's prior experience with seven national large-scale assessments carried out since 2001, and associated capacity building support received from development partners. Strong central government support that viewed building human capital as essential for economic development and support from donors also helped Viet Nam to participate in PISA. In addition, the Ministry of Education wished to learn from PISA to further develop its own national assessment system. Viet Nam is a lower-middle-income country in East Asia whose economic growth has declined in recent years: its 5% growth in GDP during 2012 was the lowest rate of growth since 1998 (World Bank, 2013). With a population of 90 million and a GDP of USD 171.4 billion, its total spending on education is relatively high at 6.3% of GDP (in 2010). Viet Nam has a 98% primary enrolment rate, a lower secondary enrolment rate above 80%, and an upper secondary enrolment rate close to 60% (Bodewig, Badiani-Magnusson, and Macdonald, 2014). The OECD estimates that only about two-thirds of Viet Nam's 15-year-olds were reflected in PISA 2012 (OECD, 2014).

Following a pilot assessment, 1997-1999, Viet Nam's first national assessment was completed in 2001 by the Viet Nam National Institute for Education Sciences (VNIES), since renamed the Center of Education Quality Evaluation (CEQE). The OECD, UNESCO/International Institute for Educational Planning (IIEP) and the Australian Council for Educational Research helped provide expertise¹⁷ for this assessment (Griffin, 2007; Postlethwaite and Leung, 2007). Although the results from the national assessment were not widely disseminated outside the Ministry of Education, the Minister embraced the results (one interviewee noted that his approach was "tell me the problems and let's figure out how to solve them").

This first national assessment demonstrated significant problems that would need to be solved. Actions were then taken and a second national assessment was conducted in 2007 to help evaluate the effects of the solutions that had been put into place. This report was widely disseminated. Since then, CEQE has carried out five national assessments at various grades and has completed one PASEC assessment (UNESCO, 2015; CONFEMEN, 2015). CEQE is responsible for both national and international assessments and has a specialised unit for PISA that comprises 15 staff. The World Bank has provided support for national assessments, and the Asian Development Bank has provided financial support for both national assessments and PISA participation (Bodewig et al., 2014).



Kyrgyzstan

Donor encouragement and financing has enabled Kyrgyzstan's participation in two PISA cycles. Changes of government and political transitions have contributed to the country's non-participation in subsequent cycles. Kyrgyzstan is a lower-middle-income country in Central Asia, with a population of 5.7 million and a GDP of USD 7.2 billion. GDP growth is high, at 10.5% in 2013, but the country relies on donors to provide support for education reform and innovation. The World Bank's 2009 Systems Approach for Better Education Results (SABER) – Student Assessment Country Report for Kyrgyzstan notes that the country has been conducting national large-scale assessments on an irregular basis, and that those conducted were driven by donor agencies. The country's Monitoring Learning Achievements (MLA) assessment of fourth grade students in mathematics, grammar, and life skills was conducted in 2001 and 2005, with the United Nations Children's Fund (UNICEF) providing funding for the 2005 exercise. The World Bank supported two national large-scale assessments of fourth and eighth grade students in mathematics, natural sciences, and reading comprehension in 2007 and 2009. There are no government policy documents regulating or authorising such assessments. While some ministerial orders have been issued, these are not policy documents.

Kyrgyzstan participated in PISA 2006 and PISA 2009, strongly encouraged by the World Bank and facilitated by grant financing through the Bank's rural education project of 2005. A World Bank report notes that the PISA results from these two cycles were "presented in a consolidated national report and distributed to key decision makers and schools," but that no further steps had been taken to participate in any other international assessments (World Bank, 2009).

The World Bank's Russia Education Aid for Development (READ) Trust Fund programme has played an active role in assessment in Kyrgyzstan, working with the three major assessment organisations: the Centre for Education Assessment and Teaching Methods, the Kyrgyz Academy of Education, and the National Testing Centre. Support for assessment through READ has focused on classroom and national assessments and on improving the technical quality of the national school-leaving examinations. In 2013, READ consultants recommended that Kyrgyzstan not participate in international large-scale assessments at that time, including PISA, on the grounds that PISA was pitched too high for lower-middle-income economies. A recent World Bank project does not include support for any international large-scale assessments, but provides continuing support for enhancing the national assessment (World Bank, 2014).

Upper-middle-income countries

Identifying the reasons for PISA participation among upper-middle-income countries is difficult, since – like Indonesia – many have decades of experience with both national and international large-scale assessments, and the decisions to participate were made two decades ago. In some cases, donor dialogue and support have contributed to decisions regarding participation.

Bulgaria

Bulgaria has participated in the majority of international large-scale assessments since 1995, including the first PISA in 2000. The country has also carried out periodic large-scale national assessments since 1994. Bulgaria is an upper-middle-income country with a population of 7.3 million and a GDP of USD 54.5 billion in 2013. It joined the EU in 2007 and one interviewee noted that: "there is no doubt in anyone's mind that Bulgaria should participate in PISA." In 2005, Bulgaria was a lower-middle-income country, and Bulgaria's participation in IEA's PIRLS 2006 and TIMSS 2007 was supported by a grant from the World Bank, through the Development Grant Facility to IEA to cover the international participation fees. The institution responsible for international large-scale assessments in Bulgaria is the Center for Control and Assessment of the Quality in School Education, which is a unit of the Ministry of Education and Science. Within the Center, a small department of eight professionals deals with PISA, as well as with the country's participation in TIMSS, PIRLS, IEA's International Computer Competence Study (ICCS), and the OECD's Teaching and Learning International Study (TALIS).

Brazil

Brazil first participated in an international large-scale assessment in 1990 (two major cities, Sao Paulo and Fortaleza, participated in the International Assessment of Educational Progress [IAEP]) and Brazil has participated in PISA consistently since 2000. Brazil is an upper-middle-income country, with a population of 198.6 million and a GDP of USD 2 245 billion in 2013. Brazil's National Institute of Educational Studies and Research (INEP) was founded in 1937 and has a staff of 440. It is responsible for: *i*) the national basic education assessment system (SAEB), launched in 1990 for grades 4 and 8, and comprising numerous assessments and school leaving examinations; *ii*) the higher education assessment system that evaluates the quality of undergraduate courses and higher education institutions and revalidates foreign medical diplomas; and *iii*) international programmes, including those sponsored by the *Laboratorio Latinoamericano de Evaluacion de la Calidad de la Educacion* (Latin American Laboratory for the Evaluation of Educational Quality, or LLECE)

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and the OECD. The Deputy Minister of Education, formerly the president of INEP, is deputy chair of the PISA Governing Board. Within INEP a small team is responsible for each assessment. In addition, non-government agencies, such as the Carlos Chagas Foundation, provide testing and measurement services for university entrance examinations.

Colombia

Colombia's participation in PISA coincided with the increase in the number of countries participating in international large-scale assessments during the mid-2000s. Colombia is an upper-middle-income country, with a population of 48.3 million and a GDP of USD 378 billion in 2013. Colombia has carried out national large-scale assessments since 1991, and has participated regularly in international large-scale assessments, beginning with TIMSS 1995, the first LLECE study (PERCE) in 1997, and PIRLS in 2001. Since 2006 it has participated in three cycles of PISA, two additional cycles of LLECE assessments (SERCE and TERCE), two cycles of TIMSS and one additional cycle of PIRLS. Participation in TIMSS 2007 was facilitated by a grant from the World Bank through the IEA, but otherwise donors have not supported international assessment activities in Colombia. PISA and the other international large-scale assessments are the responsibility of the Colombian Institute for Educational Evaluation (ICFES), an independent agency that provides assessment and evaluation services to the Ministry of Education, including managing a university selection examination. ICFES has an up-to-date website with information regarding its studies, results and research papers. The website does not list a separate unit for international large-scale assessments.

Jordan

Jordan's participation in international large-scale assessments has been encouraged by international donors and supported at the highest level of government since the late 1980s. Jordan is an upper-middle-income country in the Middle East, with a population of 6.5 million and a GDP of USD 33.7 billion in 2013. Jordan was the only country in the region to participate in the IAEA in 1991, supported through grants to Educational Testing Service from the US National Science Foundation, the National Center for Education Statistics, and the Carnegie Corporation (Lapointe, Askew, et al., 1992; Lapointe, Mead, et al., 1992). In the late 1990s, the World Bank and other donors helped finance the establishment of the National Center for Human Resources Development (NCHRD), which has since held responsibility for conducting both national assessments and international large-scale assessments in Jordan. The NCHRD has a staff of about 30 professionals, and a monitoring and evaluation unit that carries out PISA and other studies. During much of its existence, the NCHRD has received special attention from the kingdom's royal family. Jordan has participated regularly in TIMSS since 1999 and in PISA since 2006. A World Bank loan to Jordan in 2003 included funding for participation in TIMSS 2003, TIMSS 2007 and PISA 2006, although ultimately the United States Agency for International Development (USAID) and the United National Development Programme (UNDP) financed the international participation fees and the costs of international travel for the national research co-ordinators.

Turkey

Turkey, the only OECD country among the case study countries, is an upper-middle-income country straddling Europe and Asia, with a population of 75 million and a GDP of USD 822 billion. It has participated in international large-scale assessments since 1999. Turkey's participation in PISA 2003 can be linked to its interest in joining the European Union at the time, and by the fact that all OECD countries were participating in PISA. Turkey made a significant effort to develop its assessment system and to support units within the Ministry of National Education and an organisation that develops and administers university entrance exams. Two World Bank "Adaptable Program Loans" for education included support for the assessment of learning achievement. The first project in 1998 supported the Department of Educational Research and Development (ERDD) of the Ministry of National Education in completing a national assessment in Turkish, mathematics, science and social science; it also provided support for ERDD to prepare national reports from TIMSS 1999 and PIRLS 2001. The second project in 2005 was initially designed to support Turkey's participation in international assessments, including PISA, and to use PISA as a performance indicator. After the project was restructured during implementation, however, "none of the planned ... assessments were conducted" and all references to improved student performance were removed from the project's results framework (World Bank, 2012b). Nonetheless, Turkey has continued to participate in PISA and has seen its scores improve.

CONCLUSIONS AND IMPLICATIONS FOR PISA IN MIDDLE-INCOME COUNTRIES**Conclusions**

Countries participate in PISA for a range of reasons. Wealthier countries participate more often than less wealthy countries, and all OECD countries participate. Some countries with aspirations for membership in the OECD or the EU may participate for political reasons. Countries in Europe and North America participate, while many countries in South Asia, Latin America and Sub-Saharan Africa do not.



In general, money matters. Few low-income countries have ever participated: across 316 possible PISA participations for all countries classified as low-income at any time from 1997 to 2012, only five low-income PISA participations have ever occurred. As a country's economy improves, however, participation in PISA becomes more likely. Lower-middle-income countries have participated when participation is encouraged and financed by donors and when there is a high level of political commitment. The decision to participate in PISA is made at a senior level for all countries, with an official notification provided to the OECD. In many countries, the decision takes the form of a policy document. The participation of upper-middle-income countries is made easier by their long and steady support of related activities, such as national assessments and examinations, and the fact that they have established technical and administrative capacity for conducting international large-scale assessments.

Prior experience – with other international large-scale assessments or with national large-scale assessments – increases a country's likelihood of participating in PISA. This prior experience may have helped to establish sufficient capacity in a country for undertaking large-scale assessments; it also may also have demonstrated the utility of such endeavours. While the PISA cycle itself may build assessment capacity, countries with prior experience in other international large-scale assessments are likely to have established a culture of assessment. Many countries participating in PISA 2015 have a quarter century of relevant experience for doing so.

Beyond these broad generalisations, the country case studies suggest that different countries participate in PISA for different reasons, depending on their needs and capacities. The process of PISA participation begins with an initial signal of intent, which may take place several years before any given PISA cycle, and a five-year commitment to activities before, during and after the main assessment.

Implications for the expansion of PISA participation

The implications of the participation patterns in PISA described above underscore the relatively limited possibility for the expansion of PISA as it currently exists. Assuming that PISA 2015 is completed successfully by all countries listed as participants, this means that one-third of all countries – covering a large share of the world's population of 15-year-olds – will be participants. Expanding further into non-participating high-income countries would involve countries such as Saudi Arabia (a confirmed participant in PISA 2018) as well as the many relatively small non-participating high-income countries, such as Brunei Darussalam (another confirmed participant in PISA 2018), Equatorial Guinea or San Marino. Expanding to non-participating upper-middle-income countries would involve many countries in Latin America, approximately half of which are regular participants in the regional assessments led by the LLECE, and eleven of which already have participated in PISA. Nevertheless, interest in PISA in Latin America may grow. For example, Panama has confirmed its participation in PISA 2018 and Ecuador, Guatemala and Paraguay are participating in PISA for Development.

For upper-middle-income countries

The opportunity for further expansion of PISA appears to be greatest in those few upper-middle-income countries that have previously participated in IEA's TIMSS and/or have conducted regular national assessments but have not yet participated in PISA, for example: Botswana, Iran, Jamaica and South Africa. All of these countries report secondary-level enrolment rates well over 80%, with lower-secondary enrolment rates over 90%, which is important for assessing 15-year-olds in school. All of these countries also have prior experience with national, regional and/or international assessments.

For lower-middle-income and low-income countries

Eight lower-middle-income countries have previously participated in TIMSS and could be considered for inclusion. Two aspects of their country conditions, however, indicate that participation is unlikely: low secondary-level school enrolment rates in some of the economies, and recent conflict in others.¹⁸ Among these countries, only Armenia and Morocco (a confirmed participant in PISA 2018) appear to offer an opportunity for PISA participation.

Lower-middle-income countries that have carried out regular national assessments, such as the Philippines, Senegal and Zambia, may also be considered. The Philippines is a confirmed participant in PISA 2018, and Senegal and Zambia are participating in PISA for Development, which could also stimulate interest in PISA among other countries in the Africa region.

Low-income Sub-Saharan African and South Asian countries appear to offer little opportunity for PISA expansion at present. Moreover, the majority of Sub-Saharan African countries already participate in regional assessments (SACMEQ and PASEC), which may limit their interest in undertaking an international assessment.

For development partners

External financing is a major facilitator of participation in international assessments for lower-middle-income countries. This financing may come from direct grants or from components of loans to governments for education projects. For example, several recent education projects supported by the World Bank either directly supported the country's participation in an international assessment or used international assessment data to justify the project design and/or monitor the project's outcomes.

Between 2003 and 2012, international assessment activities were included in World Bank projects in eleven countries that have participated in PISA: Azerbaijan, Brazil, Bulgaria, Indonesia, Jordan, Kyrgyzstan, Moldova, Montenegro, Peru, Tunisia and Turkey (Lieberman and Clarke, 2012). In addition, the World Bank supported international assessments over the same period in another eleven countries that were not PISA participants: Bangladesh, El Salvador, Gambia, Honduras, Lebanon, Mongolia, Nepal, Nicaragua, Saint Lucia, Senegal and Ukraine. Most of these latter countries participated in TIMSS or a regional assessment. Interviews and follow-up emails with 21 National Project Managers of the middle-income countries participating in PISA 2015 indicated that nearly half of those participating in PISA 2015 were enabled to do so by external financing.¹⁹

Sustained financing across multiple PISA cycles is likely to be essential as the full benefit from participating in most international assessments, including PISA, comes from the opportunity to review changes in performance levels over time. Since PISA emphasises a specific performance domain – mathematics, reading, science – once every nine years, detailed estimates of performance changes can best be made over a much longer time frame than the three-year cycle would indicate. This requirement for sustained financing for national, regional and international assessments is recognised in the development of the Assessment for Learning initiative of the Global Partnership for Education,²⁰ which aims, in part, to improve financing for the participation of low- and lower-middle-income countries in assessments (Global Partnership for Education, 2015).



Notes

1. The IEA Pilot Study tested reading comprehension, mathematics, science, geography and non-verbal ability.
2. Income classification based on World Bank historical country classification data at the time of participation.
3. Until 2012, however, the PASEC assessment was not designed as an ILSA.
4. PISA Plus was administered in 2010 and included 10 low- and middle-income countries.
5. TIMSS, rather than PIRLS, was selected for this indicator since the TIMSS implementation period included years prior to 2000, when PISA was first implemented.
6. Data on national assessments come from the 2015 UNESCO Global Monitoring Report and were kindly provided by the Director.
7. The terms “country” and “economy” are used interchangeably and refer both to whole countries and countries represented by sub-national units and economies.
8. These lists count as separate economies Hong Kong (China), Macao (China), Puerto Rico, Scotland, Shanghai (China) and Chinese Taipei.
9. The participation rate is computed as the number of cycles in which a country has participated divided by the total number of cycles in which it could have participated (up to six to date).
10. Regional country classifications according to World Bank groups for Europe and Central Asia, East Asia and the Pacific, Middle East and North Africa, Latin America and the Caribbean, South Asia and Sub-Saharan Africa.
11. The EU countries are: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom. After joining the EU, all countries have participated in PISA with the following exceptions: Cyprus in 2006 and 2009, Lithuania in 2009, and Malta in 2006 and 2012.

Notes regarding Cyprus

Note by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

12. Serbia participated in 2012, did not participate in 2015, but is expected to participate in 2018. In addition, two states of India participated in PISA 2009 Plus, but neither India as a whole nor these two states have returned to PISA. Similarly, a sub-national region in Venezuela participated in PISA 2009 Plus, but neither Venezuela nor the region have returned. Mauritius participated in PISA 2009 Plus but has not expressed interest in participating in PISA 2018.
13. Including India (Himachal Pradesh and Tamil Nadu states) and Venezuela (Miranda province).
14. PISA 2009 Plus also included two states in India and one province in Venezuela, none of which participated in PISA 2012 or are participating in PISA 2015.
15. The OECD reports that Kyrgyzstan “plans to participate in PISA 2018”.
16. Indonesia administered TIMSS 1995, but was unable to do the steps necessary for its data to be included in the international report for this assessment.
17. Neville Postlethwaite of Hamburg University, Ken Ross of UNESCO/IIEP and Patrick Griffin of Melbourne University.
18. These countries are: Fragile or Conflict Affected: Syria, Ukraine, West Bank and Gaza Strip, and Yemen. Less than 80% secondary enrolments: Ghana, Honduras. Possible PISA participants: Armenia, Morocco (which may participate in 2018).
19. Interviews held October 28-31, 2014 during National Project Managers meetings in Dublin, Ireland.
20. The Global Partnership for Education supports 60 developing countries to ensure that every child receives a quality basic education, prioritising the poorest, most vulnerable and those living in fragile and conflict-affected countries.

Note regarding Israel

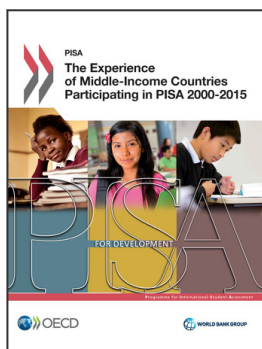
The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

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