PISA FOR DEVELOPMENT

3

What have been the challenges facing middle-income countries participating in PISA?

This chapter explores three sets of challenges facing middle-income countries that participate in the Programme for International Student Assessment (PISA): costs of participation, capacity for implementing PISA, and the country context for PISA. It reviews the evidence for each type of challenge, drawing on the literature and interviews with representatives from middle-income countries participating in PISA 2015. The first section of the chapter explores the general challenges of cost, as well as the challenges of specific expenditure items, and the role of donor support in meeting the financial challenges. The second section examines a range of technical challenges, including analytical challenges such as instrument development, scientific sampling and data analysis, as well as operational challenges presented by common timelines, sampling in federal countries, translation in multiple languages, survey implementation, and coding. The third section describes context challenges due to a country's political economy, regulatory environment and national culture.

INTRODUCTION

Prior research on the challenges facing countries involved in international assessments suggests three broad areas of deterrents: costs, capacity and context (Bloem, 2015; Lockheed, 2010). Most of the evidence regarding these deterrents is informal, arising from self-reports and casual interviews. Costs involve the direct incremental costs of participation, including international participation fees, travel costs for required meetings, printing and other costs associated with data collection and processing, as well as the personnel costs associated with conducting the assessment. Capacity involves the institutional and technical capacity to conduct the assessment and to analyse the results; this involves national survey implementation, translation demands in countries with a diversity of languages of instruction, and analytical capacity to gain insight from the results (Bloem, 2015). Context involves the broad characteristics of nations that can affect their capacity to implement PISA and their responses to and use of the PISA results. This chapter reviews these challenges, illustrates them with the experience of middle-income countries participating in PISA 2015, and makes suggestions for actions to address these challenges in the future.

FINANCIAL CHALLENGES

Although many countries mentioned that meeting the costs of participation in PISA was a challenge, many of the National Project Managers could not provide an estimate of the actual cost of PISA participation. They were, however, aware of the cost items that presented difficulties in financing and reported how donors had helped to offset these costs.

Costs of PISA

Direct costs of participation in an international large scale assessment are very small when expressed as a share of total expenditure on education (Wolff, 2007). These costs include the minimum international participation fee (set at EUR 182 000, payable at EUR 45 500 per year for four years, for PISA 2015), costs of travel and subsistence to mandatory meeting and training events (which require the use of a country's foreign exchange account), and the in-country costs associated with implementing the assessment. Wolff estimated the costs of participation – including the international participation fee – for PISA 2000 for Peru and PISA 2003 for Uruguay (Wolff, 2007). For Peru, the cost was equivalent to 0.04% of the country's annual expenditure on secondary education, and for Uruguay the cost was equivalent to 0.08%. A World Bank consultant estimated that the cost of PISA 2006 participation for Kyrgyzstan was USD 300 000, including international participation fees (M. Mertaugh, personal communication January 7, 2015). Wagner, Babson and Murphy (2011) report the costs of PISA 2009 as 0.002% of Mexico's annual expenditure on secondary education; for Panama it was 0.04%.

Interviews with representatives from the one low-income country and from 15[1] of the 25[2] middle-income countries participating in PISA 2015 revealed a wide range of estimates for the direct costs of participating in PISA, as well as an absence of information about costs in some cases. Many of the direct costs of PISA are related to the overall sample size, which was around 5 000 to 6 000 students in the middle-income countries participating in PISA 2012, with little variation among countries except for Mexico (33 806 students), Brazil (20 091) and Colombia (11 173). While translations into multiple languages could also increase costs, this was not mentioned as a major cost driver.

Information about the cost of PISA 2015 was available for only eight middle-income economies, and Costa Rica and Kosovo reported the costs of the field trials only (Table 3.1). Peru mentioned the high costs associated with computer-based assessment in PISA 2015. In all cases for which education expenditure data were made available, the reported costs of PISA amounted to less than one-half of one percentage point – and in some cases much less – of total expenditure on secondary education.

Participation in PISA involves financial commitment to a set of prescribed requirements, as laid out in the agreement documents and the National Project Manager's manual. To provide participating countries with more complete information regarding costs, the OECD could consider including additional information about the level of effort required, both human and financial, in the National Project Manager's manual.

For PISA 2015, approximately 90 separate tasks are required to complete the seven-step process of participation. In addition, the PISA National Project Manager's manual includes detailed information regarding communicating with the four main contractors responsible for leading all aspects of PISA 2015 implementation, including communication standards, which are broken down into seven "core" areas: cognitive assessment framework development; development of platform for the computer-based assessment; instrument development, scaling and analysis; survey operations and procedures; sampling; background questionnaire framework and development; and oversight and management.

Table 3.1

Direct costs for PISA 2015 implementation, selected economies

Country	Cost of field trial	Cost of main data collection	Cost of reporting	Total cost	As % of annual expenditure on secondary education
Indonesia*	USD 80 000	USD 200 000	USD 30 000	USD 310 000	0.029
Peru	--	USD 500 000	--	USD 2 000 000	0.105
Thailand	--	--	--	USD 979 600	0.01
Brazil*	--	--	--	USD 2 000 000	0.004
Jordan	--	--	--	USD 141 000	0.026
Bulgaria*	--	USD 22 040	--	--	0.003
Costa Rica	USD 98 000	--	--	--	--
Kosovo	USD 90 000	--	--	--	--

* Case study country.

Sources: Author's interviews with National Project Managers for PISA 2015, October 28-31, 2014 in Dublin, Ireland; UNESCO Institute for Statistics (2015) for annual expenditures on secondary education computed from government expenditure per student and total secondary student enrollment.

StatLink http://dx.doi.org/10.1787/888933294008

Although the National Project Manager's manual explains the tasks and communication requirements in considerable detail, it only provides explicit guidance regarding the required skills and level of effort needed and the expected incremental costs for a few of these tasks (e.g. the level of effort needed for coding open-ended responses and occupational categories is provided.) Providing an estimate of the level of effort needed, along with a description of the skills and competencies of persons required for various tasks, could be valuable for countries that have no or little experience with international large-scale assessments and may not accurately assess the resource needs related to each task. PISA for Development has been working with participating countries to develop a capacity needs analysis, a capacity building plan[3] and a project implementation plan that include detailed budgets for implementation in each country (for more details see Box 4.1 in Chapter 4).

Challenges of specific expenditure items

One-third of the countries interviewed reported that they had no difficulty in obtaining funding for PISA 2015 or paying for any expenditure item. All the remaining countries, including all the case study countries other than Colombia, identified at least one challenge in financing PISA. The lower-middle-income case study countries reported more challenges than were reported by upper-middle-income countries (Table 3.2).

Table 3.2

Financial challenges noted by case study countries, PISA 2015

	Lower middle income			Upper middle income			
Financial challenges	Georgia	Indonesia	Viet Nam	Bulgaria	Brazil	Colombia	Jordan
Salaries (full- and part-time)	-	Yes	Yes	-	Yes	-	-
Office space	-	-	Yes	-	-	-	-
Office supplies	-	Yes	Yes	-	Yes	-	-
Travel (international and local)	-	Yes	Yes	-	-	-	Yes
PISA fees	Yes	Yes	Yes	Yes	-	-	Yes
Reporting/dissemination	-	Yes	Yes	-	-	-	-
Research	Yes	Yes	Yes	Yes	Yes	-	Yes
Printing	-	-	Yes	-	-	-	-
Data processing	-	-	Yes	Yes	-	-	-

Note: Turkey did not send a representative to the National Project Managers Meeting in Dublin, November 2014, and did not respond to emails requesting information, and is therefore omitted from this table.

Source: Author's interviews with National Project Managers for PISA 2015, October 28-31, 2014 in Dublin, Ireland.

StatLink http://dx.doi.org/10.1787/888933294019

Most countries interviewed reported that they had experienced difficulties in finding funding for selected expenditure items. The most frequently mentioned items were: research and development related to PISA, international participation fees, salaries or honoraria for part-time local staff or experts working on PISA, and international travel. Part-time salaries and honoraria are important for survey administration, coding and data entry as these are short-time tasks that do not

require full-time staff. In Europe and North America such staff are often teachers whose summer holidays coincide with the PISA schedule, but this is not the case in all countries. In some countries, "topping up" the salaries of civil servants – including teachers – is not permitted, although in other countries salary "premiums" are given for specialised work, which could apply to these assessment tasks.

International travel required for National Project Manager meetings and training was also singled out as particularly challenging, in one case it required prior approval from the country's president. Other expenditure items that were mentioned included the costs associated with printing materials for training, local transport, and salaries for full-time staff working on PISA. Countries that had implemented the computer-based assessment identified specific financial challenges, particularly the absence of simple processes for contracting outside services, such as renting computers.

Donor support for PISA

Some lower-middle-income countries have received commitments from international donors to support their participation in PISA cycles (Table 3.3 reports commitments from the World Bank to support international assessments, including PISA). For example, the World Bank financed the participation of Kyrgyzstan in PISA 2006 and 2009. Donors also helped finance the PISA 2015 participation of some middle-income countries. Interviewees from four of the five lower-middle-income economies (Georgia, Kosovo, the Republic of Moldova and Viet Nam) said that their country would not have been able to participate in PISA 2015 without donor support for the assessment. The only lower-middle-income country reporting that costs of PISA 2015 were entirely covered by the country's internal funding sources was Indonesia. In addition, two upper-middle-income countries (Jordan and Lebanon) said that donor support for the international participation fees, and often for PISA-related travel costs, had enabled their participation. All other upper-middle-income countries interviewed reported that the costs of PISA were covered by the country's internal funding sources.

Table 3.3

Recent World Bank projects supporting PISA and other international large-scale assessments

Project	Year project approved	International large-scale assessment mentioned for support
Senegal – Quality and Equity of Basic Education	2013	PIRLS, PISA, TIMSS
Peru – Basic Education Project	2012	PISA, TERCE
Moldova – Education Reform Project	2012	PISA
Sri Lanka – Transforming the school education system as the foundation of a knowledge hub project	2011	PISA, TIMSS
Nicaragua – Second support to the education sector project	2011	TERCE
Lebanon – Second Education Development Project	2010	PISA, TIMSS
Jordan – Second Education Reform for the Knowledge Economy Project	2009	PISA, TIMSS

Note: Senegal is participating in PISA for Development. Sri Lanka has not participated in PISA.
Source: World Bank (2015a), Project database, http://go.worldbank.org/KTPE1WKU20.
StatLink http://dx.doi.org/10.1787/888933294026

TECHNICAL CHALLENGES

The technical challenges for participating in an international large-scale assessment are numerous and can be divided into two broad categories: analytical challenges and operational challenges. Analytical challenges include challenges of psychometrics, sampling (for sample-based assessments), data analysis and reporting. Operational challenges include data collection (including challenges related to data security and access to data) and processing. These challenges occur during each of the seven distinct stages of the assessment process: a first review phase (including instrument development), the field trial preparation, field trialling of instruments and processes, reviewing the field trial, the main study preparation, the main study implementation, a final review stage, and reporting.[4]

The steps for implementing a PISA cycle have been developed and refined over nearly two decades of experience, and the detail provided may be considered "best practice". For countries and contractors, the steps involved in completing a PISA cycle are similar to the steps involved in completing any standardised assessment, including national assessments (Greaney and Kellaghan, 2008), but there are a few differences, as described in the following sections. The technical challenges identified in case study countries are summarised in Table 3.4.

Table 3.4

Technical challenges noted by case study countries, PISA 2015

	Lower middle income			Upper middle income			
Technical challenges	Georgia	Indonesia	Viet Nam	Bulgaria	Brazil	Colombia	Jordan
Item writing	-	-	Yes	-	-	-	-
Translation	Yes	-	Yes	-	-	-	-
Sampling	Yes	Yes	-	-	Yes	-	-
Access to schools	-	-	-	-	Yes	-	-
Platform for CBA	-	-	-	Yes	-	-	-
Administering PISA	Yes	Yes	-	-	Yes	-	-
Training coders	Yes	Yes	-	-	-	-	-
Coding	Yes	-	Yes	-	-	-	-
Submitting data	-	-		-	Yes	-	-
National report	-	Yes	Yes	-	-	-	-

Note: CBA is computer-based assessment.

Source: Author's interviews with National Project Managers for PISA 2015, October 28-31, 2014 in Dublin, Ireland.

StatLink http://dx.doi.org/10.1787/888933294035

Analytical challenges

What distinguishes the analytical dimensions of PISA and other international large-scale assessments from national assessments is the degree to which contractors have responsibility for three of the most highly technical aspects of assessment: the development and refinement of the assessment instruments, scientific sampling and multi-country data analysis. While countries are involved at varying levels, the centralisation of these technical procedures in the hands of international contractors ensures that they are carried out comparably across countries and conform to high quality professional standards.

Framework and instrument development

PISA, along with other international large-scale assessments, invites participating countries to review conceptual frameworks and submit and review new items, including training for item writing and coding. Expert groups and item developers from contractors, such as the Australian Council for Education Research or the Educational Testing Service, provide the bulk of the materials, which are then revised, commented on and validated by participating countries through a series of consultations and meetings. The contractors retain responsibility for the psychometric reliability and validity of items, including assessing item bias, maintaining an item bank and ensuring that assessment instruments can be equated to maintain score comparability across countries and over time. This process is described fully in a recent paper that identifies issues in adapting the cognitive instruments for use in a wide range of country contexts (Adams and Cresswell, 2014).

Scientific sampling

Other contractors, such as Westat,[5] are responsible for the scientific sampling of the schools and students who represent the country in the assessment. Sampling for PISA is somewhat more complex than for other international assessments, since the PISA sample is age-based (involving students in multiple grades), whereas others are grade-based (and can sample intact classrooms). Countries are responsible for providing up to date lists of schools and students, sample stratification (for example, by instructional language or sub-national unit), and for using the sampling software provided, but these tasks are operational rather than analytical.

Data analysis

The majority of data analysis is carried out by the contractors and the OECD, which prepares the international reports. Preparation and dissemination of a national report is the country's responsibility, and this task appears to be a challenge for the middle-income countries participating in PISA. The OECD does not routinely collect country reports and therefore does not include reports from low- or middle-income countries on its website. However, interviews suggest that national reports were prepared and disseminated in about half of the low- and middle-income countries that had participated in PISA 2012. Several countries said that a lack of adequate resources made it difficult to produce a national report. Few countries reported having prepared policy briefs or reports targeted at schools and teachers, although many countries prepared brochures describing the country's results.

Operational challenges

Four operational dimensions of PISA were mentioned as specific challenges by National Project Managers. The first two are dimensions of PISA that distinguish it from typical national standardised assessments: *i)* the need to agree to and maintain a time line with deliverables that are co-ordinated with those of other countries; and *ii)* the additional steps required

for translation of source documents in the official OECD languages (English and French) into one or more languages of instruction and verification of the translated instruments within the agreed timelines. The second two operational challenges of PISA are common to other large-scale assessments, including national assessments: *i)* survey implementation, including gaining access to lists of schools and students for scientific sampling; and *ii)* coding of constructed-response items.

Timelines and schedules, translations, survey implementation and constructed-response coding are required in regional assessments (such as the Regional Comparative and Explanatory Study [ERCE] and the Southern African Consortium for Measuring Educational Quality [SACMEQ]) and other major international assessments (principally, the Trends in International Mathematics and Science Study [TIMSS] and the Progress in International Reading Literacy Study [PIRLS]). These activities may present challenges to some countries joining PISA.

The specific technical challenges faced by low- and middle-income countries participating in PISA are discussed in the following paragraphs. Countries with prior PISA experience and with strong national assessment or examination systems reported fewer operational challenges than countries lacking this experience.

Common timelines

Several countries mentioned the importance of adhering to the timelines for implementation as outlined in the National Project Manager's manual and accompanying documents. One interviewee mentioned that "technical procedures provided by PISA and OECD should be strictly followed", and another emphasised that countries should "do things on time; contact the contractors and do what Core 1-6 says!" Maintaining timelines may be challenging when the PISA timeline conflicts with national or other international assessments or examinations, and other operational tasks may be challenging when appropriate staffing is unavailable. Contractors also mentioned that while most countries participating in PISA 2015 had been able to complete all the tasks required for the field test, the contractors needed to remind some National Project Managers on a near-weekly basis of the actions that needed to be taken to meet pending deadlines.

Sampling

Sampling is a challenge in large federal countries (such as Brazil and Mexico) and in countries with high degrees of decentralisation (such as Indonesia). It is also a challenge when central agencies do not have access to comprehensive lists of schools, and may need to work through sub-national authorities. Many countries lack the education management information systems that would facilitate the sampling task. Decentralised responsibilities for education can also present a challenge with respect to gaining access to schools in a timely manner.

Translation

PISA provides "source documents" in the two official languages of the OECD: English and French. Countries that do not use either as the language of instruction are responsible for translating the survey instruments from these source documents into the language, languages or regional versions of some languages (such as Spanish, Portuguese, French and Arabic) in which the students will be tested. This process requires an understanding not only of the core assessment domains but also specific education terminology in order to maintain clarity and comparability. The process of translation and back translation, often by multiple translators (given the multiple instruments that need to be translated), was mentioned as a challenge in several countries, since this process often required more time than originally scheduled.

To help meet this challenge, the Latin American countries participating in PISA 2015 hired a translation firm to create "source documents" in Spanish. Support for translating the science items was provided by a donor, *Groupo de Analisis para el Desarrollo* (GRADE) in Peru (S. Cueto, personal communication 4 April 2015). Translation challenges may increase if PISA expands further. Many countries that do not currently participate in PISA use multiple languages of instruction, for example, different states in India have different instructional languages. Multiple languages add to the costs and operational complexities, as the instruments must correspond to the source documents and to each other. Translation is also an issue for countries that conduct national assessments in multiple languages, but the "source documents" are more likely to be in a national rather than international language.

Survey implementation

The many operational challenges of PISA and other international large-scale assessments can be offset by detailed instructional manuals. For PISA 2015, the National Project Manager's manual is 177 pages of specific instructions and checklists of activities that cover the four-year development and implementation cycle for the assessment. It is designed to ensure that the results are comparable across countries. Throughout the PISA cycle, National Project Managers are required to organise and carry out approximately 90 separate and related tasks, including attending multiple meetings and training courses, such as: four National Project Managers meetings, international training for the field trial (covering

survey operations, coding and data entry), and international training for the main study (survey operations, paper item coding, and data entry training). These multiple tasks have been grouped into 21 categories for capacity-building activities to better suit low- and middle-income countries (OECD, 2014a; 2014b; 2015a; 2015b).

Countries using the computer-based assessment platform for the first time identified it as a challenge for survey implementation. Issues with the computer-based platform included difficulties in obtaining (renting or purchasing) sufficient computers for the assessment, and scheduling the computers for assessment sessions.

Coding

Coding of constructed-response items requires a high degree of inter-coder reliability for the results to be meaningful. Obtaining this reliability requires considerable training and quality control. Coder training sessions are included in the PISA implementation process, and these sessions are generally well attended: 20 of the 26 middle-income countries participating in PISA 2015 attended coder training provided in 2014. However, coding of open-ended responses appears to take more time than anticipated in the schedule for PISA, particularly when this task requires hiring and training part-time staff. Some countries do not have smooth procedures for obtaining temporary professional staff, such as coders, and the time frame within the PISA schedule is constrained for this activity.

In addition, cultural expectations regarding coding may hinder the process. Specifically, to assess inter-coder reliability (and therefore have the opportunity to discard unreliable coders), double coding open-ended questions (constructed-response items) without resolution of discrepancies is required. This may present problems in countries where the resolution of discrepancies in real time (as, for example, with "table scoring" which involves two or more coders that sit at a table, score the same tests and resolve discrepancies in real time) is a common practice, particularly in the case of scoring national examinations. Contractors identified countries that needed to improve their coding for the main study from the submission of PISA 2015 field trial data that did not meet the inter-coder reliability goal of 92% agreement. It is anticipated that the inter-coder reliability for the main study will meet this goal as a result of continued training.

The OECD recognises these challenges and the National Project Manager's manual is intended to address them. Countries that have participated in several cycles report fewer challenges than those that are relative newcomers to PISA.

CONTEXT CHALLENGES

The context for undertaking a PISA cycle is shaped by a country's political economy, regulatory environment and culture. Over 90% of PISA implementation has taken place in the developed world. As PISA expands its reach to include more non-OECD and more non-Western countries, differences in the context for assessment will need to be taken into account.

Context can affect various aspects of PISA participation in different ways. The political economy can affect changes in administration and education ministers – and hence support for the assessment – as well as the environment for public discourse regarding education reform in general and PISA results in particular. A country's regulatory environment can affect the ease of doing business, particularly in terms of contracting for short-term goods and services. And cultural differences among countries (or among regions) can shape the nature of the cross-cultural contacts that are essential for both adherence to agreed-upon schedules and peer learning.

These broad generalisations were underscored by several interviewees, who said that building an enabling environment was a key challenge to participating in PISA. Issues identified included the challenge presented by changes in administration and consequently education ministers, difficulties encountered by independent assessment agencies that have weak linkages to the financial arms of the ministry, and procedural challenges in obtaining financing. In addition, some interviewees mentioned that outreach to stakeholders was essential and that it was important to "inform everybody about the assessment", "target other stakeholders, especially families, to raise their awareness about the study and help them understand the results", and to introduce PISA to teachers "to help them realise the importance of PISA." The OECD has noted that countries have shared their methods for outreach and knowledge dissemination, such as brochures, flyers and websites, with other countries adopting these approaches.

Political economy

The political economy of most long-standing PISA participants can be characterised as "democratic", meaning that the countries typically have a high degree of citizen voice and accountability, as measured by perceptions of various stakeholders. The World Bank Governance Indicators project recently ranked over 200 countries/economies according to their rating on "voice and accountability". This ranking showed that only one (Costa Rica) of the middle-income countries participating in PISA 2015 was rated in the top quartile of all countries for "voice and accountability", compared with 70% of the participating high-income economies (World Bank, 2015a).

Since governments join PISA, government effectiveness can be important for effective implementation. The "governance effectiveness" index from the World Bank's Governance Indicators project reflects the perceptions of the quality of public services; the quality of the civil service and the degree of its independence from political pressures; the quality of policy formation and implementation; and the credibility of the government's commitment to such policies (Kaufmann et al., 2010; World Bank, 2015b). Among the middle-income countries participating in PISA 2015, only one (Malaysia) is ranked among the top quarter of the more than 200 countries with respect to government effectiveness. By comparison, 72% of the participating high-income countries are ranked in the top quarter. The effectiveness of the public institutions responsible for PISA may also influence the implementation of the assessment.

Freedom of the press affects how easily the results from PISA can be shared broadly with the public. The World Press Freedom Index provides a measure of press freedom that has been used by the European Union (EU) in discussions of the European Neighbourhood Policy in 2014, and is also a useful index for considering the opportunity for public discussion of PISA results in middle-income countries (European Commission, 2015). The index ranked 180 countries/economies on "the degree of freedom that journalists, news organisations and netizens enjoy in each country, and the efforts made by the authorities to respect and ensure respect for this freedom" (Reporters Without Borders, 2014). Only one country (Costa Rica) of the 25 middle-income countries participating in PISA 2015 is among the top quarter of all 180 countries rated, and 30% of middle-income PISA 2015 participants are in the lowest quarter. By comparison 65% of the 46 high-income countries/economies participating in PISA 2015 are in the top quarter and only two are in the lowest quarter. The presence, or absence, of press freedom may help explain the results regarding the public dialogue of PISA results, discussed in Chapter 5.

Regulatory environment

A country's regulatory environment – a key feature of "ease of doing business" – can affect operational aspects of PISA, such as contracting needed temporary staff (for coding, data entry, etc.), purchasing supplies and equipment, or leasing computers for computer-based assessment. The World Bank has ranked 189 countries for overall ease of doing business, with specific reference to a country's regulatory environment for operating a local firm. This regulatory environment may also affect the local agencies, including ministry units, responsible for conducting PISA. PISA implementation will be easier in countries with a more favourable environment for doing business. A higher share of countries participating in PISA are in the top quartile for ease of doing business, in comparison with all countries. Specifically, 75% of high-income countries participating in PISA 2015 and 35% of middle-income countries are in the top quartile, compared with 59% of all high-income countries, and 12% of all middle-income countries (World Bank, 2014).

National culture

National culture can be difficult to assess, but research over 50 years has shown that differences in national cultures can affect the ease of cross-cultural communication in business contexts (Hofstede et al., 2010). Since communication among peers and between countries and contractors is essential for implementing PISA (and other international large-scale assessments), awareness of differences in national culture may be needed, and adjustments made, to avoid miscommunication.

One aspect of international large-scale assessments that can be misunderstood is their status as "low-stakes" assessments. In some countries, the students and schools selected for participation may believe, incorrectly, that the results will affect them personally, thus turning a "low-stakes" assessment into a "high-stakes" assessment in their eyes. This in turn can increase test preparation activities in an effort to improve scores.

Furthermore, sensitivities regarding national performance in PISA can influence the degree to which the results are discussed publicly. Such sensitivities may create a political risk for elected governments, which need to defend the quality of their education systems. The response to the results from international large-scale assessments in different countries indicates how cultural differences can affect behaviour. In 2000, Germany suffered "PISA shock" when the country scored below the OECD average and in the middle of the score distribution. This "PISA shock" was a call to action that has been well documented (Dixon et al., 2013; Ertl, 2006). By comparison, when Mexico scored below expectations in TIMSS 1995, it declined to publicly release its scores (J. Prawda, personal communication, 5 January 2015).

CONCLUSIONS AND IMPLICATIONS FOR PISA IN MIDDLE-INCOME COUNTRIES

Conclusions

Middle-income countries that are currently participating in PISA face financial, technical and contextual challenges in conducting the assessment. Efforts are already under way to bring additional countries into PISA and these will need to take these challenges into account.

1. The main financial challenge is adequate and sustained financing – over a 10- to 15-year period – for the units or agencies responsible for PISA, so that countries can participate in the multiple rounds of the assessment that are needed to measure trends in performance.
2. The main technical challenges are largely operational ones: translation into multiple languages from source documents provided in only a few languages, sampling (particularly in large federal or decentralised systems), and selected implementation aspects as described above. Although only a few middle-income countries have developed national reports or have conducted secondary analysis of the PISA data, this was identified as a financial issue rather than lack of technical capacity.
3. The main contextual challenges of the political, regulatory and cultural environment may be overly broad to address through PISA. However, differences between countries that are participating in PISA and those that are not – in terms of government effectiveness, press freedom, ease of doing business and subtle cultural characteristics – may affect PISA implementation.

Implications

For middle-income countries

To address the substantial financial challenges identified by the middle-income countries participating in PISA, countries could:

1. Ensure that budgets for the national units responsible for international assessments, including PISA, are sufficient to cover their costs, and work with development partners to help mitigate financial challenges.
2. Expand resources for research using the PISA data to enable country-specific analyses that could help guide quality and equity improvements relevant to the country.

To address technical challenges, countries could:

1. Ensure that technically relevant representatives of national units responsible for international assessments attend the various capacity building sessions offered by PISA partners and contractors.
2. Consider establishing or expanding units responsible for international assessments, in line with the technical level of effort needed to complete the various tasks involved.

To address contextual challenges, countries could:

1. Analyse their own governance, regulatory and cultural context to identify issues that could compromise the successful implementation of PISA and other international assessments.
2. Improve outreach to stakeholders so that the entire education system – from the central ministry to teachers to parents – has a better understanding of the assessment, what it shows and what it can be used for.

For development partners and the OECD

To address financial challenges and building on the PISA for Development initiative, partners and the OECD could:

1. Develop a cost manual aligned with the National Project Manager's manual that would help countries estimate the actual costs of conducting the assessment. Such a manual could elaborate the level of effort required to complete each task in terms of time, technical qualifications and skills of the required staffing, physical resources needed and associated costs.
2. Establish research and development programmes, possibly through fellowship and grants, that could lead to analyses of PISA data that is more attuned to the policy needs of the individual participating countries.

To address technical challenges and building on the PISA for Development initiative, partners and the OECD could:

1. Provide support for creating additional source documents in major international languages, such as Spanish or Chinese, which could help mitigate some of the translation issues.
2. Provide support for extending peer learning on effective ways to gain co-operation from subnational units, particularly in large federal systems, which could help mitigate some of the sampling issues.

To address contextual challenges and building on the PISA for Development initiative, partners and the OECD could:

1. Consider adjusting certain PISA processes, while maintaining quality standards, as such adjustments might be relevant to specific countries.

Notes

1. Interviews with Brazil, Bulgaria, Colombia, Costa Rica, Mexico, Peru, Thailand (computer-based assessments for PISA 2015), Former Yugoslav Republic of Macedonia, Georgia, Indonesia, Jordan, Kazakhstan, Kosovo, Lebanon, FYROM, Moldova, Viet Nam (paper based assessments for PISA 2015).

2. Lower middle-income economies: Former Yugoslav Republic of Macedonia, Georgia, Indonesia, Kosovo, Moldova, Viet Nam. Upper-middle-income countries: Albania, Algeria, Argentina, Brazil, Bulgaria, Colombia, Costa Rica, Dominican Republic, Jordan, Kazakhstan, Lebanon, FYROM, Malaysia, Mexico, Montenegro, Peru, Romania, Thailand, Tunisia, Turkey.

3.These reports are available at the PISA for Development website: www.oecd.org/pisa/aboutpisa/pisafordevelopment.htm. The Project Implementation Plans are working documents for participating countries and have therefore not been published.

4. Westat is an employee-owned research corporation consulting in statistical design, data collection and management, and research analysis work.

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